

\*\*\*\*\*AUTO\*\*3-DIGIT 857  
 S117298 D08 0306  
 TOM MILLER 554  
 ASST CHIEF ENGINEER  
 KTZR  
 2033 S AUGUSTA PL  
 TUCSON AZ 85710 7905

**Let's See the Toys**  
 Neil Glassman has an idea to improve your radio experience of the NAB show floor.

Page 46

**Is It a Keeper?**  
 Passions run high when folks talk about processing. *Buyer's Guide* takes a look.

Page 31

# Radio World



\$2.50

The Newspaper for Radio Managers and Engineers

June 2, 2004

**INSIDE**

**NEWS**

▼ A Washington station adds a second audio channel. **Page 2**

▼ An award-winning exhibitor: The FCC. **Page 4**

**ENGINEERING**

▼ Stephen Poole explores wireless networking in Alabama. **Page 14**



▼ Rust never sleeps, as Workbench discovers. **Page 17**



**GM JOURNAL**

▼ NPR delves into ethics and fairness for journalists. **Page 21**

▼ Great creative copy has a better likelihood of "printing" with your listeners. **Page 27**



Sign Up For NewsBytes Weekly Digest at [www.rwonline.com](http://www.rwonline.com)

## NPR Plans a New Way to Move Audio

*ContentDepot System, Coming This Year, Will Transform Public Radio Distribution*

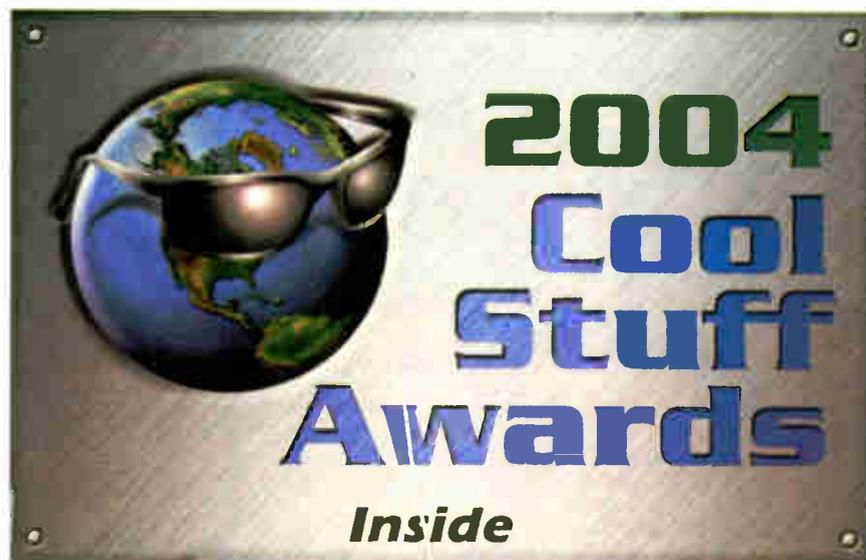
by Michael LeClair

**WASHINGTON** Faced with growing demands for audio distribution, the Public Radio Satellite System plans to deploy a new generation of satellite equipment in late 2004. Known as ContentDepot, the system marks a departure from previous distribution

methods in a move to packet-based audio program delivery.

The satellite system now in use delivers audio programs in real time, as analog or AES serial digital audio. Programs are assigned a fixed time to be uplinked to the system, although affiliate stations often will choose to

See CONTENT, page 8 ►



## What the FCC Wants To Know About IBOC

**WASHINGTON** Terrestrial digital radio has moved from the theoretical to the real. With early implementation have come new questions. Radio people — and all Americans — have an opportunity to tell the FCC what they think about in-band, on-channel digital radio between now and July.

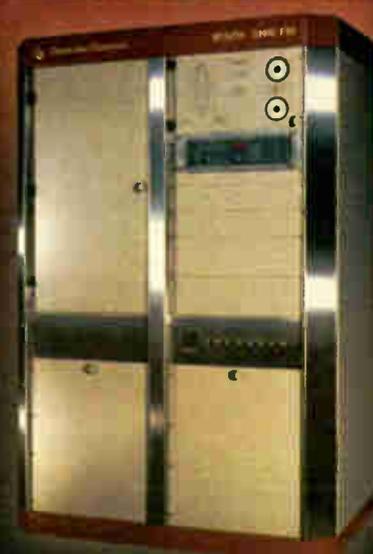
The FCC has released the text of its Further Notice in the IBOC rulemaking, offering insight into what the agency wants to know as it finalizes ground rules under which radio will operate in digital for years to come.

Here are excerpts from the FCC notice. In some cases, original punctuation and capitalization have been edited to make the questions clear in this context. Comments to MM Docket 99-325 are due to the commission on June 16 and replies are due July 16.

**Number of Radios** — Currently, 108 million U.S. households, or 98 percent of all U.S. households, have a radio device.

See IBOC, page 6 ►





**Response From Customers,  
In a Word,**

“Awesome”  
“Ingenious”  
“Beautiful”

“When can I have one?”  
(more than 1 word and heard many times)

We continue to receive praises about our introductions at the NAB. Look for more innovations to come.



[www.contelec.com](http://www.contelec.com) 800.733.5011

## DIGITAL NEWS

## WAMU Goes Digital, Has Second Channel

**WASHINGTON** American University's WAMU(FM) is beta-testing a second digital channel with special authorization from the FCC. It believes it's the first station to do so, aside from the original four test stations for the Tomorrow Radio project.

The station, which began HD Radio transmission May 7, has divided what would normally be a 96 kilobits-per-second FM digital data stream into 64 kbps for the main digital audio stream and 32 kbps for the supplemental portion of the digital stream.

The supplemental audio channel, which the station is calling "WAMU 2," includes

transmission of a 7-minute demonstration that includes clips of WAMU and NPR programs. The station began transmitting the supplemental stream on May 8.

Program-associated data also is being transmitted using hard-drive systems from D.A.V.I.D. Systems Inc.

WAMU has a Harris digital transmitter and Dexstar exciter; it is using high-level combining with an ERI IBOC combiner.

Harris provided a prototype Flexstar Importer to WAMU for use with its digital transmitter to broadcast supplemental audio. The importer manages the advanced HD Radio applications for datacasting and supplemental audio channels. It multiplexes the data or supplemental audio in a format that is compatible with the Ibiqity system, preparing it for modulation along with the primary audio, according to Harris.

WAMU's digital conversion cost around

\$110,000. It received CPB funding for most of the cost and had a separate grant for the remainder.

WAMU tested the supplemental channel with live programming for one hour on May 12 as a demo for about 200 station members who gathered in NPR's board room. The audience heard the performance over a modified Kenwood HR-100 receiver.

## RDS Gains Forum

**WASHINGTON** If commercial radio has rediscovered RDS, and if those owners are using it in the top 50 markets, it would be a glaring omission if public broadcasters there don't do the same.

That was the message from Jim Paluzzi, new vice president of applied technology for Colorado Public Radio, for attendees of the

Public Radio Leadership Conference in May.

Paluzzi and some others in public radio are promoting the concept of Radio Data Services as a way to keep up with radio technology in the interim before converting to digital. Some public radio regional groups are large, and their executives say they can't afford to convert all their stations to digital at the same time.

"We need to use this. In the top 50 markets, Clear Channel is putting up song title and artist on its stations," Paluzzi said.

Attendees saw examples of program-associated data included with the digital signal from Washington FM noncoms WETA and WAMU. PAD is part of the IBOC data stream should stations wish to use it.

Then attendees saw demos of RDS including PS scrolling data — song title and artist names and a telephone number to call during fundraisers. NPR Senior Engineer Jan Andrews and Senior Technologist John Kean participated in the demo.

Steve Johnson, newly promoted to general manager of Boise State Radio, manned the transmit portion. He used a laptop as the source of audio and data.

The audio went to a low-power 100-milliwatt transmitter, while data was fed into an Inovonics 712 RDS encoder. The low-power subcarrier signal on 90.7 MHz was received using an RDS table radio from Cambridge SoundWorks 730, which retails for about \$199. Johnson estimated the cost of doing basic RDS at roughly \$800, including installation of an RDS encoder at a transmitter site.

## CPB Funds AM IBOC Technical Evaluations

Noncommercial station owners can take advantage of a Corporation for Public Broadcasting-funded technical ascertainment for CPB-qualified licensees.

For those who sign up, CPB will pay for an engineer to determine if a station is IBOC-ready, checking transmission power levels, ground radials and other factors. The program is to begin in June. Those interested should contact Doug Vemier, a CPB digital radio consultant, at [dvemier@v-soft.com](mailto:dvemier@v-soft.com).

— by Leslie Stimson



**More.**

The Wheatstone GENERATION-5 has the POWER and FEATURES Stations Demand the MOST

# LOTS More!

**Our Generation-5** provides your operators with a straightforward traditional control surface coupled with all the benefits of digital technology. It gives you the flexibility of system-wide source, mix and destination control (any signal anywhere), a powerful mix-minus section and a complete event store, name and recall system. One wire from this surface can control THOUSANDS of wires in your technical operations center.

And while the G-5 feels like an analog console, its DSP-based mixing engine keeps your digital sources digital while converting analog sources to switched digital, eliminating crosstalk and noise. It can furnish remote and telcom functionality on any input fader without fear of feedback—a real plus in back-to-back

daily operations. Its built-in graphic displays keep operators on top of things with just a glance. And since the entire system is software based, you can accommodate any format with a press of a button.

Like all our Generation Series consoles, the G-5 has complete failsafe options available, such as automatic fail-over DSP and CPU cards and redundant power supplies. We can even provide scheduling software and studio mounted satellite cages that can be configured to mix independently from your main routing system.

At WHEATSTONE we've built and sold over a thousand digital audio consoles. The G-5 is a culmination of all that experience. Benefit from our expertise — choose WHEATSTONE!

**Wheatstone**

600 Industrial Drive, New Bern, North Carolina 28562  
252-638-7000 / [www.wheatstone.com](http://www.wheatstone.com) / [sales@wheatstone.com](mailto:sales@wheatstone.com)

copyright © 2004 by Wheatstone Corporation

### INDEX

#### NEWS

NPR Plans a New Way to Move Audio	1
What the FCC Wants to Know About IBOC	1
Digital News	2
FY2004 Regulatory Fees Proposed	3
From the Editor	4
Kahn: Cam-D Is Better Than IBOC	5
NewsWatch	12

#### FEATURES

Wireless, a Blissful Beautiful Thing	14
Workbench: On Towers, Rust Never Sleeps	17
The Fundamentals of Supplementals	18

#### GM JOURNAL

Defining Ethics and Fairness at NPR	21
Radio Boosts Homeless Awareness	26
It Tastes as Great as It Sounds	27
New 'Public Alert' Standard Is for Weather Radios	28

#### BUYER'S GUIDE

WOR Is Loud, Proud With Omnia 5-EX	31
KUSC(FM) Likes Diversity of FMX480	32
Eventide BD-500 Turns It Up to 40	33

#### OPINION

Nick Berg	46
A Modest Proposal to Improve the Show	46

# FY 2004 Regulatory Fees Proposed

The FCC hopes to collect roughly \$273 million in regulatory fees for fiscal 2004, which begins Oct. 1. The proposed fees range from \$350 for a Class C AM in markets with populations of less than 25,000, to \$8,775 for Class B, C, C0, C1 and C2 FMs in markets with more than 3 million people.

On average, radio fees rose 10 percent over what was proposed last year.

The commission is reviewing public comments on the fees and is expected to issue the final amounts this summer. The agency will not mail notices to stations reminding them when the money is due.

It plans to publicize fee payment information on its Web site at [www.fcc.gov/fees](http://www.fcc.gov/fees).

Those who file late will be assessed a 25 percent late fee.

These fees are for commercial stations; non-commercial stations are exempt from FCC regulatory fees.

— by Leslie Stimson

Proposed FY 2004 Radio Station Regulatory Fees						
Population Served	AM Class A	AM Class B	AM Class C	AM Class D	FM Classes A, B1 & C3	FM Classes B, C, C0, C1 & C2
<=25,000	600	450	350	425	525	675
25,001 - 75,000	1,200	900	525	625	1,050	1,175
75,001 - 150,000	1,800	1,125	700	1,075	1,450	2,200
150,001 - 500,000	2,700	1,925	1,050	1,275	2,225	2,875
500,001 - 1,200,000	3,900	2,925	1,750	2,125	3,550	4,225
1,200,001 - 3,000,000	6,000	4,500	2,625	3,400	5,775	6,750
>3,000,000	7,200	5,400	3,325	4,250	7,350	8,775
AM Radio Construction Permits						465
FM Radio Construction Permits						1,650
Low-Power TV, TV/FM Translators & Boosters (47 CFR Part 74)						385
Broadcast Auxiliaries (47 CFR Part 74)						10

**Company: Armstrong Transmitter Corp.**  
**Product: X-1000B AM Transmitter**



Hey, it fits in seven rack spaces!

Armstrong isn't one of the "glamour boys" of transmitters. But this 13-year-old company with the legacy radio name, founded by Sinan Mimaroglu, is worth keeping an eye on.

Its new AM transmitter has two 600-watt RF modules and is HD Radio-ready. Modulators are on the RF modules for redundancy and to allow hot plugging. The module interlock is behind the locking screw, which ensures the module is cold when pulled and active only when locked in.

Monitoring and control functions are on the front, or a rear DB-25. Power can be adjusted (high, medium or low) and output adjusted using a toggle switch.

Features include surge suppression on the AC line; rear-mounted twist lock connector for AC input, and matching plug; external RF input that allows for AM stereo or HD Radio input; RF test port for a mod monitor or test instrument. Two fans provide cooling. Retail: \$9,875.

Jim Glatz holds the award while Wayne Rochette and Ernie Belanger beam.

Info: (315) 673-1269 or [www.armstrongtx.com](http://www.armstrongtx.com).



Photo by Al & Michele Peterson

**Company: D&M Professional**  
**Product: Marantz Professional PMD670**  
**Portable Compact Flash MP3/WAV Recorder**



Face it: radio reporters don't exactly get a huge batch of new pro field recorders to choose from every spring. When one does come out, it's cause for attention. Particularly if it has XLR connectors on the back and the name Marantz on the top.

The PMD670 is a solid-state recorder, no tapes or disks. It'll put up to 70 hours on 1GB Compact Flash cards. It can record in linear PCM and compressed, MP3, MP2 (to MP3, MP2, WAV) and BWF audio formats using 40 assignable audio quality settings.

You can transfer audio files into a computer for editing or distribution by placing a recorded card into the computer PC card drive; or use the unit's computer I/O port for file transfer. The PMD670 is compatible with Marantz Professional's PMDEdit editing and file management software. Retail: \$899.99.

Info: (866) 405-2154 or [www.d-mpro.com](http://www.d-mpro.com).



## How to Submit Letters

Radio World welcomes your point of view on any topic related to the U.S. radio broadcast industry.

Send letters via e-mail to [radioworld@imaspub.com](mailto:radioworld@imaspub.com), with "Letter to the Editor" in the subject field; fax to (703) 820-3245; or mail to Reader's Forum, Radio World, P.O. Box 1214, Falls Church, VA 22041.

## ELECTRONICS RESEARCH, INC.



**Winner of a  
Radio World  
"Cool Stuff"  
Award**

**Dual Input Side Mount  
FM Antenna  
For IBOC Applications**

- Both analog and digital signals are radiated from the same elements
- Digital has the same gain as the analog
- Uses no additional aperture
- No additional wind loading from interleaved elements

+1 (812) 925-6000 | [www.eriinc.com](http://www.eriinc.com)



Your Single Source for Broadcast Solutions

FROM THE EDITOR

# Commission, Too, Does 'Cool Stuff'

by Paul J. McLane

Boy, the FCC comes in for a lot of abuse.

So knowing the good work that the agency staff does with little praise, I was tickled when Radio World's "Cool Stuff" Award judges singled out the FCC for its fun and informative booth on the radio/audio exhibit floor at the NAB2004 convention.

Bravo to the commission for taking a higher profile — an idea of Deputy Chief of the Wireless Bureau Jerry Vaughan — and kudos to NAB for providing the space.

Real FCC experts answered questions about auctions, tower siting and many other issues. On hand were folks from the Media Bureau, the Enforcement Bureau's Consumer and Governmental Affairs Bureau and the Wireless Telecommunications Bureau.

"The FCC Mapping system, which was part of a disk handout, was so popular that over 1,000 were handed out in the first day and a half," an FCC official told me.

Several folks asked how they could start a radio station — "a short question with a long answer," as one staffer put it.

"Fortunately, our Web site has a section addressing just this question. Many people asked about LPTV and LPFM, and we had a fair number of people asking about Broadcast Auxiliary Services.

"One man's questions prompted us to look at better ways to access certain information — telling us that sometimes the process of finding the answer was just as important, thus giving us a chance to see what we can do better."

The feds also gave away a frequency! The winner was Charles Green of Las Vegas, who won a 30-day nationwide "Special Temporary Authority" for 93,000.000000 to 93,000.000001 MHz, and 1 milliwatt of maximum power.

(I wonder what he'll do with it. Maybe he can whip up a quick IPO and retire



The Radio World 'Cool Stuff' judges gave an honorable mention to the FCC for putting a human face on the commission. From left: Brian Carter, Dan Rumelt, Pat Rinn, Steve Markendorff, Cindi Schieber and Dan Abeya. Not shown: Ruby Hough, Lisa Scanlon, Tom Nessinger, Linda Sanderson, George Dillon and Robert Somers.

early on the proceeds before anyone notices the rather limited application.)

★ ★ ★

This is our annual "Cool Stuff" Award issue. Congratulations to the companies that took home radio's most prestigious technical honor.

They were chosen by a panel of anonymous engineers and industry experts as notable for their design, features, cost efficiency and performance in serving radio users. These are the products that caused the judges to stop in the aisles and say, "Oh, cool!"

I am proud that, year in and year out, our judging teams have presented a comprehensive and informative list of winners to our readers. If you didn't attend NAB and you want to bone up on what was new, a look at the "Cool Stuff" list is a great way to start.

You will learn more about the winners

on the pages of this issue. My thanks to the superb team of judges, whose names are not revealed and who do their work for nothing more than a dinner and the satisfaction of service to Radio World.

We'll have an in-depth new product review next issue.

★ ★ ★

And if you *didn't* go to the NAB show, you missed a chance to enter not one but several drawings to win prizes from various companies. These were impressive prizes.

Broadcast Warehouse gave away a special gold-plated version of its DSPX broadcast audio processor, worth more than \$3,500.

D.A.V.I.D. Systems gave away a Latitude Edition automation package, which included three workstations and on-site training. Including runner-ups, D.A.V.I.D. handed out some \$50,000



The winners of the 2004 Radio World "Cool Stuff" Award:

AKG Acoustics C 414B-XLS/C 414B-XLII Microphone  
 Armstrong X-1000B AM Transmitter  
 Audemat-Aztec Navigator 007 FM Field Strength Meter  
 AudioScience ASI8702/03 Eight-Channel Tuner Adapter  
 Broadcast Electronics Big Pipe Media Transport System  
 Broadcast Tools DMS-III Digital Monitor & Switcher III  
 Burk Technology ARC-16 Web Interface  
 Comrex STAC Studio Telephone Access Center  
 D&M Professional Marantz PMD670 Solid-State Recorder  
 DAWNco Handymeter-Sat  
 ENCO Systems Gardien Indecency System  
 ERI Dual-Input Side-Mount FM Antenna  
 Henry StudioDrive Integrated PC Studio System  
 MicroGen Electronics TS9000 FM Broadcast Analyzer  
 Narda Safety Test Solutions Selective Radiation Meter  
 Orban Opticodec-PC  
 Shively IAD Antenna System  
 Tieline i-Mix G3 Stereo POTS Codec  
 Ward-Beck Systems ALFA Audio Leveller for Audiophiles

Honorable Mention:

Federal Communications Commission Exhibit Booth

worth of gear.

Also, numerous prizes were given during the NAB Amateur Radio Reception, sponsored by Heil Sound, including the new Heil Proline performance microphones signed by none other than ham buff Joe Walsh of the Eagles. ●

## Get online with the new solution for IP control and monitoring.

Access your remote site over the Internet.

Simultaneous operators and multiple access levels.

Installs at the studio or transmitter site.

Alarm notifications by email and SMS.

Customizable HTML-based interface.

You need an IP solution for remote facility control that's adaptable and easy to manage. One that will work whether your transmitter site has T1 or no network connection at all. And you need something that's easy to implement.

The Web Interface from Burk Technology adds IP control to the GSC3000 and VRC2500 transmitter remote control systems, allowing access from any Internet connection and a standard web browser. SNMP-enabled, with multi-operator support, the Web Interface installs at the studio or transmitter site — wherever an Ethernet connection is available. Enjoy the benefits of a totally integrated solution that offers the flexibility needed by today's broadcasters.

BURK TECHNOLOGY 800-255-8090 (Main Office) | 800-736-9165 (Kansas City) | WWW.BURK.COM

GUEST COMMENTARY

# Kahn: Cam-D Is Better Than IBOC

by Leonard Kahn

Now is the time for all good broadcasters to come to the aid of their country and their industry.

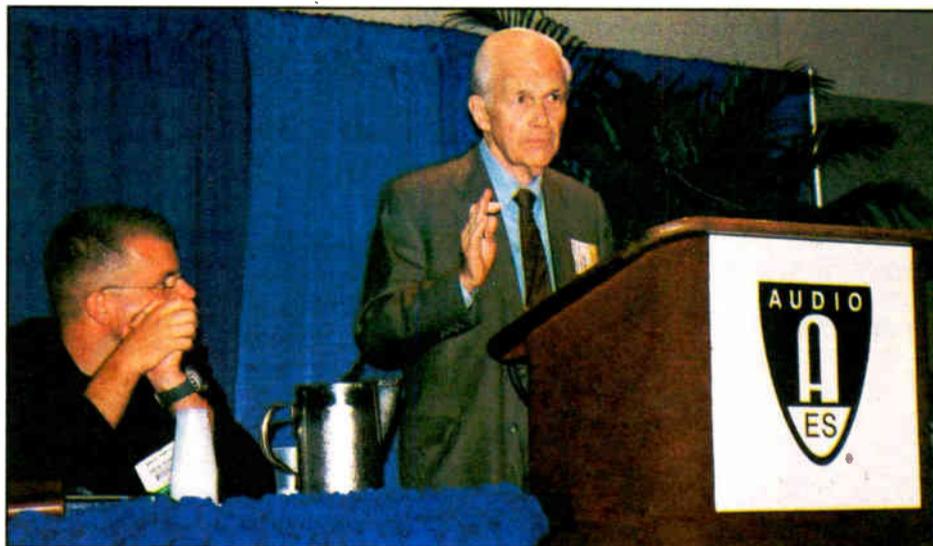
This statement may appear to be an exaggeration, but I truly believe that the IBOC system threatens both the AM and FM industries and thus threatens free radio broadcasting. Furthermore, it is no stretch that while our country is at war and that our homeland is subject to further attack, supporting technology that interferes with AM radio that is essential to alerting Americans of an attack is clearly not in the public interest.

The real question is: What can station owners, GMs, engineers, PDs, talent and everyone else who makes a living in radio broadcasting do to come to the aid of free broadcasting and our country?

Simple: write a short (or long) letter to the FCC and then give the commission your comments re the impact of IBOC on AM broadcasting. Even though you have until June 14 to send the commission your comments (Docket 99-325), the sooner you get your comments in, the sooner people who watch for such filings

will react to your views. Please e-mail me at [radio221@aol.com](mailto:radio221@aol.com) so I can spread your words to other people that want to save broadcasting.

IBOC systems for over 10 years, long before Kahn Communications Inc. developed the Cam-D System, so you can be certain that I would be opposing the



Leonard Kahn speaks during the AES convention in New York in 2003.

As you may know, I have been opposed to the original and the revised

wideband IBOC system even if Cam-D had never been invented.

Cam-D's slim spectrum not only makes you a better spectrum neighbor, it increases your coverage, drops power-line buzz, reduces fading and is capable of the best-ever AM stereo. It works night and day. It's not afraid of the dark.

Also, your listeners can see your

music information, name of artist, tune and where "viewers" can get a copy. It can also give weather reports, road conditions, stock market prices and scores of your local teams.

And most important, Cam-D allows you to provide three channels to the government so it can protect us at locations even beyond your present best coverage.

Another important use of the Cam-D's scrolling visual display system is that it provides service to the 29 million hearing-disabled Americans. Since Cam-D's narrow spectrum allows high- and low-powered stations to coexist, a hearing-disabled person will not be denied warnings of dangerous local storms.

KCI is developing battery-powered Cam-D radios incorporating flashing lights to alert users of emergencies, such as storms and early warnings of military attacks.

Finally, you do not have to argue against the digital age, you just want the best of both analog and digital worlds without infuriating the American public by making their property, their radios, useless — thus destroying the main advantage AM and FM radio has over all of its incompatible competitors, the 800 million radios Americans rely upon every day of the year.

There really is an IBOC system that is truly in-band and is in the public interest. Write today.

Comments filed through the Electronic Comment Filing System can be sent as an electronic file via the Internet to: [www.fcc.gov/e-file/ecfs.html](http://www.fcc.gov/e-file/ecfs.html).

Kahn is president of Kahn Communications Inc.

RW welcomes other points of view.

**Company: Broadcast Electronics Inc.**  
**Product: Big Pipe Media Transport System**



BE should give a raise to the guy or gal who thought up the name Big Pipe. It captures what the product is all about.

Big Pipe is a "high-throughput-rate, point-to-point wireless solution for the transport of all types of data in the broadcast environment." (Doesn't "Big Pipe" sound better?)

It can be used for sending audio and other info for a station cluster to a multi-transmitter site over one wireless link. Big Pipe can handle data equivalent to 28 T1s, and it is full duplex (bi-directional).

For sending information from studio to studio, Big Pipe can take the place of a wired solution.

BE said it will allow implementation of present and future data services for RDS, HD Radio and secondary audio channels such as Tomorrow Radio.

Big Pipe can provide Ethernet, serial data, last-mile telephone service, remote control information and video (huh!) to and from your transmitter site.

Basic systems start in the mid-\$30,000 range. Tim Bealor and Kim Winking are shown at the Pipe station.

Info: (217) 224-9600 or [www.bdcast.com](http://www.bdcast.com).



Photo by Al & Michele Peterson

**Company: Henry Engineering**  
**Product: StudioDrive Integrated PC Studio System**



Hank Landsberg's latest is a comprehensive audio system that turns a PC equipped with a sound card into a self-contained studio.

The StudioDrive adds console functions — source selection, mixing and monitoring — to a sound card. It has inputs for five sources (one mic, four stereo line), mix-minus output and a monitor system with air input and auto mic-on muting. What next, a phone coupler? (Whups, it's got that, too.)

It's intended for live broadcasts or PC-based audio production. Hank (that's him in the photo) says it is ideal for radio automation or a newsroom, edit suite, voiceover studio, emergency studio or LPFM. Price: \$595.

Info: (626) 355-3656 or [www.henryeng.com](http://www.henryeng.com).



Photo by Al & Michele Peterson

**New Features Now Available!**

**Audemat-Aztec**  
Broadcasting Innovation

# FMB80

## R-D-S encoder

The standard!

**The encoder that never stops evolving...**

- ➔ **New** Song titles and artist information can be automatically wrapped around with text
- ➔ **New** Text can be centered, customized and configured through a new HTML web page
- ➔ **New** An internal scheduler can display messages at user specified times of day

**Call now to get your free firmware version & upgrade your FMB80 via FTP!**

[www.audemat-aztec.com](http://www.audemat-aztec.com) - North Miami Beach, FL USA: tel: +1 (305) 692 7555  
fax: +1 (305) 682 5533 - [ussales@audemat-aztec.com](mailto:ussales@audemat-aztec.com)

AM/FM Mobile metering - AM, FM & TV Air monitoring - Remote Control

# IBOC

► Continued from page 1

We estimate that there are, on average, five radios per household or about 500 million receivers. ...

We estimate that there are nearly 800 million radio sets in use in the United States.

**Conversion Policy** — We seek comment on the pace of the analog-to-hybrid-

**Datacasting** — Should (the FCC) adopt a flexible policy permitting radio stations to produce and distribute any and all types of datacasting services? Alternatively, are there certain types of services that a radio station must provide, such as enhanced emergency alerts, before it is permitted to offer other data services? Are there certain services that should be prohibited? ...

As for noncommercial radio stations, we seek comment on what SCA services would be inconsistent with the public broadcasting responsibilities of hybrid or

**Equipment Issues** — How would the adoption of a high-definition audio requirement affect receiver manufacturers? Would current receiver specs need to be changed if we permit multicasting or subscription services?

**Public-Interest Obligations** — If a broadcaster chooses to provide multiple digital audio streams, how should public-interest obligations apply? We also seek comment on how certain public-interest obligations may be applied to subscription-based DAB services.

**Emergency Alert System** — We tentatively conclude that it is in the public interest to apply the rules provided in Section 73.1250 to all audio streams broadcast by a radio station. ... We realize that by requiring AM and FM radio broadcast stations to comply with Section 73.1250 of our rules for all audio streams (both analog and DAB), such stations may have to update and/or replace their EAS decoders to accommodate the digital portion of the stream.

We seek comment on the costs and timing involved in such compliance (for broadcasters and manufacturers).

ing coverage, we adopted in the DAB R&O a three-pronged approach to the issue of primary sideband power levels for AM. ... When interference problems are anticipated prior to commencement of interim IBOC operations, or when actual interference occurs, we permit licensees to adjust the power level of the primary digital subcarriers downward by as much as 6 dB. Licensees are required to notify the commission of any such power adjustments.

In cases in which the hybrid AM IBOC operation of one station results in complaints of actual interference within another station's protected service contour and the respective licensees are unable to reach agreement on a voluntary power reduction, we may order power reductions for the primary digital carriers or, in extreme cases, termination of interim IBOC operation. In such cases, an affected station may file an interference complaint with the commission.

This complaint must describe any test measures used to identify IBOC-related interference and fully document the extent of such interference. The Media Bureau is charged with resolving each complaint within 90 days.

In the event the bureau fails to issue a

## 'Should the FCC require broadcasters to provide a minimum amount of high-definition audio?'

radio conversion and the possibility of an all-digital terrestrial radio system in the future. ... what changes in our rules would likely encourage radio stations to convert to a hybrid or an all-digital format. We ask whether the government, the marketplace, or both, should determine the speed of conversion from analog to hybrid, and eventually, to digital radio service.

**High-Definition Digital Audio Broadcasting** — Should (the FCC) require broadcasters to provide a minimum amount of high-definition audio and, if so, what minimum amount should be required? The public may be served by such a policy because radio stations would provide a free programming alternative to satellite radio and compact discs.

We also seek comment on the amount of capacity necessary to allow radio stations to broadcast a high-quality digital signal and permit the introduction of new datacasting and supplemental audio services. If we adopt a high-definition service requirement, should we have separate rules for AM and FM stations?

How many audio streams (can) a radio station transmit using IBOC without causing interference or degrading audio quality? Will the availability of additional audio streams spur public demand for digital audio receivers?

all-digital noncommercial educational stations.

DAB interference with analog SCA services has been an issue in this proceeding. Ibiqity performed field tests, which showed that, in some circumstances, analog SCA receivers may receive significant new interference from IBOC stations operating on second-adjacent channels.

Following the tests, NPR commissioned a study using average receiver performance to estimate the number of listeners potentially affected by additional interference from IBOC in the top 16 radio markets. The results show that, on average, additional interference from IBOC could affect 2.6 percent of eligible receivers within an FM station's service area.

(In the DAB Report and Order), we raised concerns about this level of interference and its potential impact on radio reading services. We now seek comment on measures to protect established SCA services from interference.

**Subscription Services** — Should we allow for subscription services as long as the licensee provides at least one free digital audio stream, as we do for digital television? ... We seek comment on whether we should impose spectrum fees for that portion of the spectrum used by broadcasters to provide subscription services.

## 'Should the FCC impose spectrum fees for the spectrum used by broadcasters to provide subscription services?'

**AM Nighttime Authorization** — The staff has issued a Public Notice seeking comment on NAB's recommendations and proposing that AM stations who wish to implement nighttime IBOC service immediately do so under the commission's STA procedures. We request comment here on expansion of interim IBOC procedures to allow all AM stations to implement IBOC service at night without prior authority, as NAB proposes. How else can we help facilitate improvement in the IBOC standard so that AM digital radio service can be received throughout the day and night?

**Interference** — In the interest of striking a balance between interference concerns and the strong interest of maximiz-

ing coverage, we held that the interfering station shall reduce immediately its primary digital subcarrier power level by 6 dB.

We seek comment on whether this complaint process is working, and, if so, whether we should make the process permanent when final IBOC standards are adopted.

**Patents** — In earlier stages of this proceeding, many parties stated that adoption of Ibiqity's IBOC system would require the use of certain patented technologies. They expressed concern that the commission's endorsement of the Ibiqity system will create an

See IBOC, page 7 ►

## FINISH FIRST...

Sure all the action is in the field, but a great remote needs a great home base. And there's nothing better than the Matrix Rack. It's compatible via POTS and ISDN with ALL Comrex codecs as well as those from nearly everyone else. Perfect for receiving those GSM calls from the field.

Make the Matrix Rack the center of communications for ALL your remotes.

**Doing a remote? Put Comrex on the line.**

Toll Free: 800-237-1776 • www.comrex.com • e-mail: info@comrex.com  
 19 Pine Road, Devens, MA 01432 USA • Tel: 978-784-1776 • Fax: 978-784-1717

# IBOC

► Continued from page 6

opportunity for these patent holders to impose excessive licensing fees on broadcasters and listeners who have no alternative source for the technology.

In response, Ibiquity agreed to abide by the guidelines common to open standards, which require that licenses be available to all parties on fair terms. ... We seek comment on Ibiquity's conduct during the interim period (and) on whether this matter needs to be further addressed now or whether we should wait until radio station conversion has progressed to a point at which digital receivers have substantially penetrated the market.

**Digital Audio Content Control** — It appears likely that future digital audio broadcast receivers will include advanced features such as digital recorders capable of storing audio content and that digital audio broadcast transmissions are likely to include specific song identifications in the "meta-data" within the digital data stream. Using this data, it may be possible to have a recording device automatically search for and record a large amount of the music of an individual artist or group or find and record particular specified song titles to the extent the songs are broadcast locally. ...

RIAA expresses concern that the launch of digital audio broadcasting, in an unencrypted manner, will permit consumers to "exploit" recorded music in ways that "ignore the intellectual property interests" of the recording labels and artists and deprive them of legitimate compensation.

Although no specific proposal for action has been submitted to the commission, we are mindful that certain available options may be extremely difficult to implement later after a significant base of equipment has been deployed and consumer expectations have developed. ... We ask whether the concerns raised by RIAA warrant commission action either in terms of the technical standards that govern the service or the rules that govern the conduct of digital audio broadcasters.

We seek specific comment on two central issues: (1) does a problem exist that requires governmental intervention; and (2) to what extent can, and should, the commission involve itself in this matter. ... Is the copying of DAB content for noncommercial use by consumers a threat to recording artists and copyright holders?

What evidence is there that injury has been, or will be, incurred? For example, what economic injuries have recording artists suffered in countries, such as Great Britain, where DAB is now commonplace? Is the problem of home copying limited to DAB or does the alleged threat extend to SDARS and analog audio content converted to a digital format?

What are the possible solutions to the matters raised by RIAA? We note that Congress has addressed certain issues relating to the recording of broadcast music through adoption of the Audio Home Recording Act of 1992. We seek comment on the relationship between this Act and any action the commission might be requested to take. ●

**Company: Electronics Research Inc.**  
**Product: Dual-Input Side-Mount FM Antenna**

Analog and digital transmitted from the same elements, and no STA required.

ERI's antenna is capable of transmitting both the analog and digital FM signals without a high-loss hybrid combiner or a circulator to attain isolation between the D and A transmitters. Low-power isolators may be specified based on site considerations, for added protection to the digital transmitter or for multiplexed operations.

According to ERI, the design meets the FCC requirement for informal notification of IBOC implementation.

The antenna is a true dual-input design; it excites all radiating elements with both signals. You can use a single antenna while eliminating combining loss as in the 10-dB hybrid combining method.

The antenna can achieve in excess of 30 dB isolation between A and D inputs without using an isolator/circulator; no analog signal is lost to a reject load and no additional insertion loss caused by a circulator. Both formats have the same horizontal and vertical patterns and therefore the same gain.

Price is \$17,000 to \$120,000, depending on gain. The company quotes 60- to 90-day delivery.

Kenny Brown and Kinsley Jones are shown radiating over their award.

Info: (812) 925-6000 or [www.eriinc.com](http://www.eriinc.com).

2004  
Cool  
Stuff  
Award

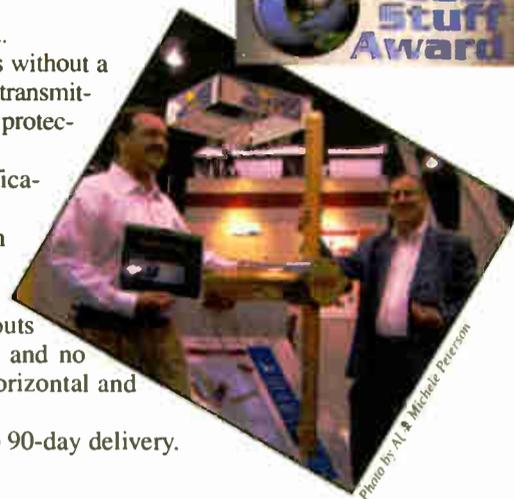
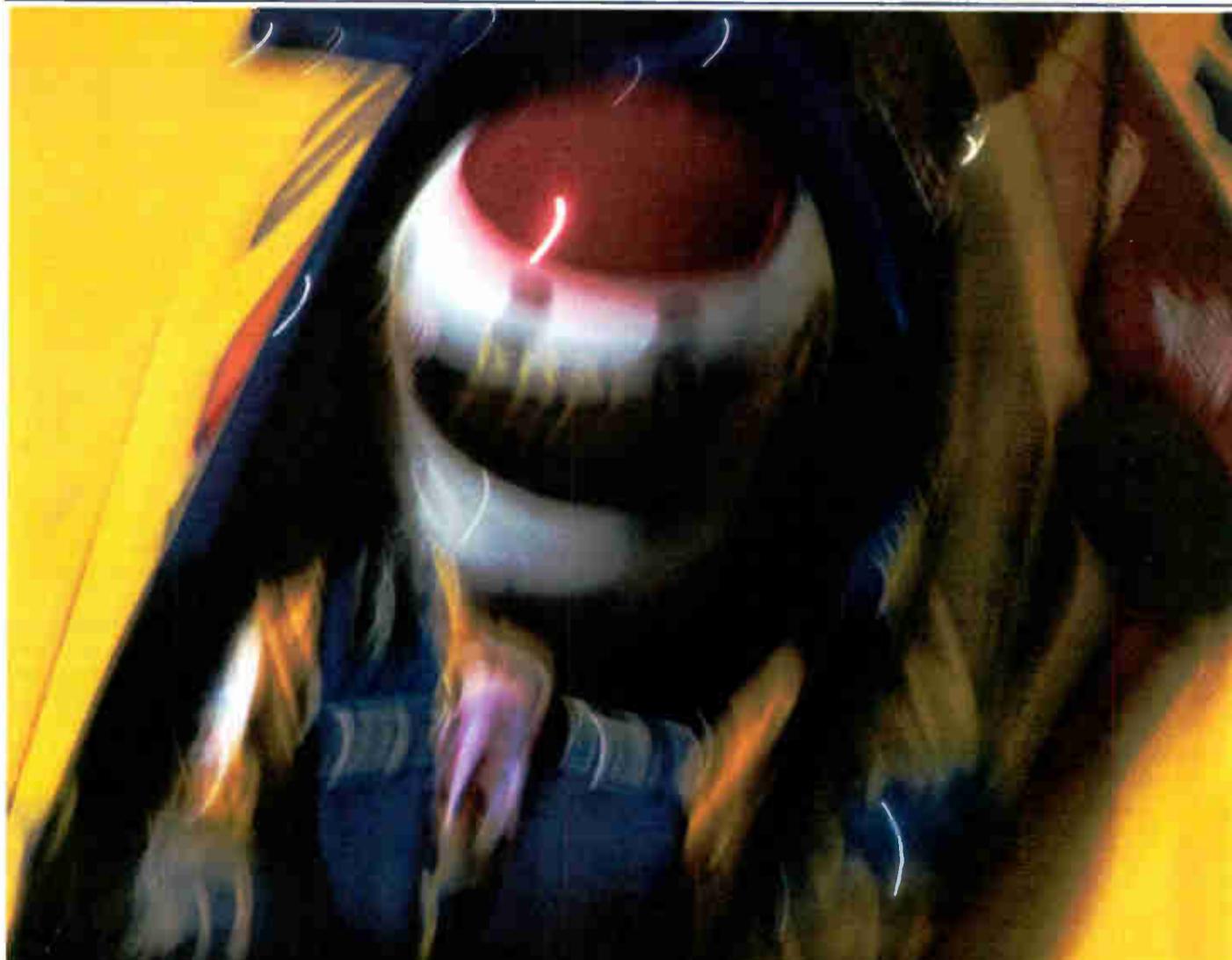


Photo by: Al. Michele Peterson



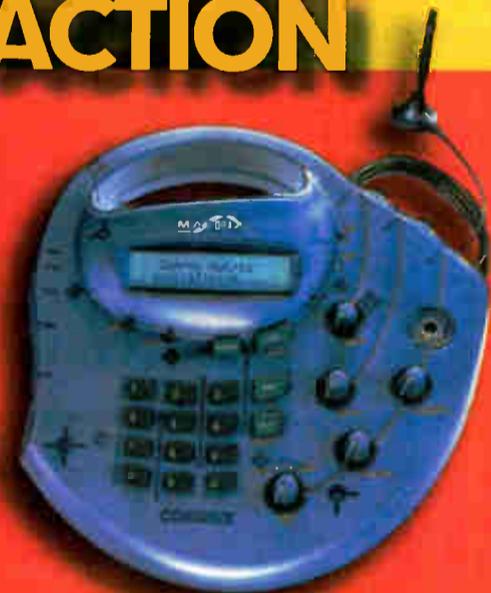
## GET IN ON THE ACTION

Delivering the sound of the finish line to listeners around the world is as simple as pressing a button. The Comrex Matrix, equipped with our optional GSM Module, combines an integrated mobile phone and an advanced Comrex codec to deliver broadcast quality 7kHz audio over standard cellular connections (15kHz over POTS).

The results? Your listeners hear the sweat pouring off the winner — the sound of a skin-of-the-teeth victory with detail that's unprecedented.

Grab your audience by their ears and give them the full experience — not just a story.

**Doing a remote? Put Comrex on the line.**



**COMREX**

Toll Free: 800-237-1776 • [www.comrex.com](http://www.comrex.com) • e-mail: [info@comrex.com](mailto:info@comrex.com)  
19 Pine Road, Devens, MA 01432 USA • Tel: 978-784-1776 • Fax: 978-784-1717

# Content

► Continued from page 1

air these programs at various times, using automated recording equipment to capture and play them back.

The change will create a distribution system that treats audio as data files, bringing with it new capabilities, supporters believe. This shift in approach was driven by a need for increased data capabilities and a goal of building the latest generation distribution using non-proprietary hardware, according to Marty Bloss, director of technology for NPR Distribution.

NPR Distribution is the office within NPR responsible for distributing programs to NPR stations and other users of its programs, and thus will be a major user of ContentDepot.

"When we looked at all the requirements for program-associated data and the desire build a system with off-the-shelf components, we quickly realized the need to move to a system that treats everything as data," Bloss said.

## Commercial use?

The new technology has sparked interest on the part of commercial radio networks. Potential applications include the distribution of advertising material and voicetracking to groups of stations. "It's become pretty obvious to us that

others are watching to see how the technology performs," said Bloss.

PRSS is the distribution network through which programming is delivered

in Washington, are owned by the Public Radio Satellite Interconnection System Charitable Trust.

PRSS interconnected stations will



International Datacasting's Patrick Fleury poses with a receiver. Each station will get two; one is a back-up unit.

to public radio stations. Each participating station is a stakeholder in the collective assets of, and services provided by, the satellite system.

Interconnected stations own their own downlink and uplink equipment. The satellite transponder capacity, as well as the national operating system equipment

receive new ContentDepot-compatible equipment. The cost is covered by station interconnect dues. Costs of the new generation of equipment are estimated to be approximately the same as when PRSS converted from analog to digital operations in 1995.

New features will allow the large and diverse population of program producers in public radio to have better control of their programs as well as provide new services to stations such as program-associated data. ContentDepot allows automatic tracking of program carriage and a way to provide promotional materials to stations interested in new programs.

"With ContentDepot, producers can manage their content in ways they haven't been able to up until now," stated Laura Jensen, manager of planning and communications for NPR Distribution, which uses PRSS to dispense its programs.

Stations airing programs from ContentDepot will also benefit, the PRSS says. Web-based tools will allow stations to request programs via the Internet and schedule automatic delivery over the satellite.

Programs will be delivered based on the individual station air schedule, eliminating the need to track the current complicated real-time feed schedule. There will still be live streams that air at given times; but everything else will become flexible in download time, within the usage window

specified by the program producer. Live news magazines will be fed as data downloads for stations that wish to delay or repeat the playback.

Stations also will be able to create individual profiles that receive messages (such as program rundowns) only for programs of interest, unlike the current internal public radio Direct Access Communications System messaging, known as DACS.

## Speed workflow

"We conceive this as a way to make the workflow easier," said Mike Black, general manager of WEOS(FM) in Geneva, N.Y. At WEOS, existing satellite delivery and automation systems are not connected. Files are moved between these systems via "sneakernet" — copying files manually onto removable media and carrying them from computer to computer.

Black details difficulties in blending programs under the current structure of program delivery.

"I hate promo feeds," said Black, describing the challenge of manually cutting up a half-hour block of promo feeds that are recorded in real time in order to use these with automation.

ContentDepot addresses this concern by allowing individual stations to request only desired promos, which can be inserted automatically into program automation.

A preview of the ContentDepot system was offered at the Public Radio Engineering Conference in Las Vegas in April. Public radio engineers and managers saw demonstrations of the new distribution and receiver technology.

To open the presentations, the audience was treated to a viewing of a "Satellite Night Fever" video made in 1979 and describing the transition to satellite delivery of NPR programs, an experimental concept at the time.

In what can be seen as a similarly transformational move, the ContentDepot concept employs a multi-channel-per-carrier technology in which many individual audio programs can be uplinked simultaneously. These audio programs are multiplexed into one large data stream of up to 8.5 Megabits per second.

Station receivers decode audio programs as needed from the larger stream. To ensure data integrity, a variety of error detection and correction schemes are used, such as interleaving and Reed-Solomon coding.

Unlike the current distribution

See CONTENT, page 10 ►

## OMNIRAX BROADCAST FURNITURE

"When I was researching furniture for our new flagship facility in L.A., I looked at all the usual suppliers. We had unique custom requirements and not all of the existing furniture vendors were able to help us. Then someone suggested that I call Omnixax.

Upon visiting their facility in Sausalito I was delighted with what I saw. Although a mass production woodshop complete with CNC woodworking equipment, I found them eager to help with our most unique design requirements. I had only some crude sketches of what I wanted, but David Holland at Omnixax took these and in days presented me with full computer renderings of what the furniture could look like from several view angles. After we made quite a few changes over several weeks we had it. I was happy to have found them; working with them was a real pleasure. The studios our interior designers had envisioned became a reality - and all of the technical details had been addressed. I knew when I first saw the first produced furniture I had made the right choice. Our collaboration from design to production resulted in more than I had originally hoped for.

Everyone at Entravision is thrilled with the result. I wholeheartedly recommend Omnixax to everyone."

John Buckham  
Project Engineer  
Entravision Communications  
Radio Division

Omnirax P. O. Box 1792 Sausalito, CA 94966  
800.332.3393 415.332.3392 FAX 415.332.2607  
www.omnixax.com

Company: **AKG Acoustics**  
Product: **C 414 B-XLS/C 414**  
**B-XLII Microphone**



The C 414 has been around for 33 years. Judges were tickled with AKG's updates, which include 15 enhancements. Among the most noteworthy for broadcasters are the electronic switches for mic functions (we loved playing with them), three pre-attenuation pads and three bass roll-off filters with different filter slopes, including a 6 dB slope at 150 Hz. The C 414B-XL II is a vocal-tuned version with self-noise of 6 dB and 158 dB dynamic range.

The mic kits include a deluxe shock-mount, two-stage external pop filter, external windscreen and a metal case. They carry a three-year warranty and are built by hand in Vienna, no doubt with the melody of "Edelweiss" playing in the shop.

Retail: \$999 and \$1,049, respectively. Mike Torlone is the happy camper. Info: (615) 620-3800 in Tennessee or visit [www.akgusa.com](http://www.akgusa.com).



# Leading POTS Codecs Compared.

	Comrex Matrix	Tieline Commander	Zephyr Xport
Audio Bandwidth @ 24 kbps @ 19 kbps	14 kHz 11.2 kHz	15 kHz 9 kHz	15 kHz 15 kHz
<u>Direct</u> Internet Software Updates	No	No	Yes, via Ethernet port
Digital PC Audio Input	No	No	Yes, via Ethernet port and supplied driver
Audio Metering (XMIT/RCV)	Transmit only	One-at-a-time	Simultaneous
Audio Processing	None	Simple AGC	Digital multi-band AGC with look-ahead limiter by Omnia
Remote Control	No	RS-232 and dedicated computer	Ethernet via Web browser
Auto Dial Storage	19 Numbers	50 Numbers	100 Numbers
Frequently-Used Settings Storage	none	none	30
Standards-based POTS Codec	No - Proprietary	No - Proprietary	Yes - aacPlus (MPEG HEAAC)
Transmit-Receive Quality Display	No	Yes	Yes
Contact Closures	2	2	3
Display Resolution	120x32 LCD	120x32 LCD	128x64 LCD
Analog Cell Phone Interface	Optional	Standard	Standard
Mixer Inputs	1 mic, 1 mic / line	2 mic / line	1 mic, 1 line
Phantom Power	No	No	Yes - 12 volt
Automatic Voice-Grade Backup	No	No	Yes
Power Supply	External	External	Internal auto-switching
Local Mix Audio Outputs Headphone Line Level	Yes Yes	Yes No	Yes Yes
Direct Receive Audio Output	No	Yes	Yes
Uses ISDN at the Studio Side for More Reliable Connections	No	No	Yes - your Zephyr Xstream becomes universal POTS and ISDN codec.
Available ISDN Option	\$850.00 (adds MPEG L3 & G.722)	\$850.00 (adds G.722)	\$495.00 (adds G.722 & state-of- the-art AAC-LD for high fidelity and low delay)
List Price:*	\$3,700.00	\$3,650.00	<b>\$2,495.00</b>

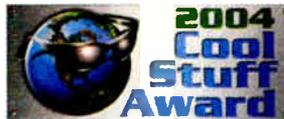


The world's most advanced POTS codec  
is also the world's lowest priced POTS codec.

*Telos*  
AUDIO | NETWORKS

\* Refers to base MSRP without ISDN option as of 5/1/04. The Telos logo, Zephyr, Zephyr Xstream, Zephyr Xport are all registered trademarks of TLS Corporation, © 2004. aacPlus (TM) Coding Technologies. Comrex, Tieline and associated trademarks are property of their respective owners. Product specifications quoted from manufacturer's most current published documentation at time of printing.

**Company: Burk Technology**  
**Product: ARC-16 Web Interface**



The ARC-16 Web Interface integrates TCP/IP with the ARC-16, allowing broadcasters to control remote sites from their Web browser.

Metering, status and command channels for the ARC-16 system are accessible on-screen, which gives you the flexibility to monitor and control one or multiple sites without special software on each PC.

"What sets the Web Interface apart from other TCP/IP solutions is the ability to install the Web Interface at the studio or transmitter site, so there is no need for Ethernet at the transmitter location," Nathan Burk told us.

Alarm notifications are sent to PCs, cell phones, PDAs ... any device that receives e-mail or SMS. Control privileges can be enabled or disabled for individual operators. The device supports SNMP and security protocol is built in.

Retail price is \$1,495. Orders are being accepted for delivery in July.

Nathan Burk, Stephen Dinkel and Anita Russell celebrate their "Cool Stuff" Award.

Info: (800) 255-8090 (main); (800) 736-9165 (Kansas City) or www.burk.com.



# Content

► Continued from page 8

system, ContentDepot delivers audio in packets, using a standard known as User Datagram Protocol, similar to how audio files are streamed over the Internet. UDP streaming does not require time synchronization between the uplink and downlink, delivering packets in bursts as satellite channel capacity allows, according to the materials given out by PRSS.

The packets are received and temporarily stored, or buffered, placed into the proper order and finally "streamed" out as real time audio.

Each individual audio or data transmission is assigned a Program ID before being combined into the large data stream. Station receivers then "pull" a desired program transmission by using the PID to reassemble the stream or data file using only the desired packets and ignoring the rest.

An advantage of using a packet-based delivery system is the ability to combine program-associated data with a given audio program, such as associated graphics or promotional material for an individual station Web site. The data is sent as part of the program but is decoded separately and split off using metadata, a set of standard identifiers that allow automated routing, such as importation of information into station Web sites.

## Automatic file transfer

Using the high-speed data channel available on the satellite, a program stream can be decoded in real time, similar to the live channels in use with today's distribution system. For the past year, PRSS has been testing the reliability of this streaming concept and has found it to be as good as the current system, which carries one channel per carrier.

A special Ethernet-connected adapter is used to convert audio data streams for live programs, such as the daily "All Things Considered," into a real-time audio feed. Each audio adapter is capable of four stereo outputs in both digital and analog formats.

ContentDepot will handle two other types of distribution: live streams that are stored for repeat playback, and audio files that are requested for playback at a certain date and time but that do not require a real-time streaming. An example of the latter would be a pre-produced program like "Car Talk" that may be aired at different times in markets across the United States.

In both cases, the satellite receiver temporarily would store these audio programs as data files on an internal hard drive. PRSS envisions the use of standard File Transfer Protocol to then move audio programs into automation systems owned by the individual stations, via a standard Ethernet connection.

PRSS is working with several manufacturers of broadcast automation systems to make these file transfers automatic.

ContentDepot Operations Workshops are planned in conjunction with public radio meetings through the rest of 2004 to allow station personnel a chance to learn the system before final deployment. 

## "Logitek gives me the capabilities I want."



### First Broadcasting Console Configurations

2 Logitek Audio Engines, networked

6 analog I/O cards  
72 inputs & outputs

4 digital I/O cards  
32 stereo inputs & outputs

2 SharcAttack multi-DSP processing cards for EQ, dynamics processing and more

2 Numix-12 consoles



**"For audio consoles, I always choose the Logitek Audio Engine with the Numix control surface."**

I believe it's a product that gives a lot of bang for the buck. Its mix-minus capabilities and ease of use make it a real winner, and it looks great. We have used this board in both on-air and production rooms in many radio, TV and Webcasting facilities in two states, and I have never had any off-air time, EVER!"

— Jay Rose, CE  
JRBE Inc.

Logitek Electronic Systems, Inc.  
5622 Edgemoor  
Houston, TX 77081 USA 713.664.4470 800.231.5870 www.logitekaudio.com

**Logitek**  
Console Router Systems

©2004 Logitek Electronic Systems, Inc.

**marantz**  
PROFESSIONAL

# Introducing The New Recording Standard

PMD670 COMPACT FLASH MP3/WAV RECORDER



**2004**  
compact flash



CDF  
**1990**



mini disc  
**1980**



DAT

**1970**

cassette



Why waste time rendering audio into your editing software? The **Marantz Professional PMD670** will record 48k uncompressed .wav audio files and allow a direct transfer into your computer. Get back to quality recording without the hassle.

- 6 hours of uncompressed 48k .wav recording on 2 gig card
- USB direct download (no real time transfer)
- 5-7 hour battery life (alkaline, NiCAD, NiMH)
- XLR inputs with 48v phantom power
- One-touch record with 2 sec. audio cache
- EDL markings during record or playback
- No moving parts / no maintenance
- \$899 suggested retail price

**D&M Professional**

1100 Maplewood Dr., Itasca, IL 60143

p: 630.741.0330 f: 630.741.0652 [www.d-mpro.com](http://www.d-mpro.com)

World Radio History

# ◆ NEWSWATCH ◆

## First Broadcasting Proposes Speedier Station Mods

**DALLAS** First Broadcasting Investment Partners LLC has asked the FCC to consider rule changes to speed up and make more efficient the AM and FM modification process. The group has filed a rule-making request.

"The FCC is currently doing an outstanding job despite a massive workload. These proposed changes will promote the public good by improving radio station modification and allocation procedures, while reducing FCC time and expenses processing requests," said Gary Lawrence, president and vice chairman of First Broadcasting.

The commission seeks public comment on the proposals, the first step in reviewing and revising its procedures governing FM and AM radio facility modifications and allocations.

First Broadcasting's proposed rule changes include: Permitting FM station community of license changes through a minor modification; Simplifying the procedure for moving a community's sole local service to a new community; Simplifying the procedure to remove non-viable FM

allotments; A one-time settlement window to resolve the backlog of pending FM rule-makings; Permitting AM station community of license changes through a minor modification; and, Streamlining Class C0 reclassification procedures.

The petition is RM-10960.

## Prank Call to Castro Costs WXDJ \$4,000

**MIAMI** Two Miami DJs, fined by the FCC for not telling Cuban President and dictator Fidel Castro he was on the air before a call began, ran a contest to collect pocket change for the fine. According to published accounts, DJs Enrique Santos and Joe Ferrero planned to pay their fine in pennies to protest the penalty.

The FCC proposed a \$4,000 fine for Spanish-language WXDJ(FM) in April for violating the rule that requires notification before a caller is placed on the air. In June of 2003, Santos and Ferrero phoned the Cuban Foreign Relations Ministry and persuaded Cuban officials to put Castro on the line. The DJs aired phrases from a speech by Venezuela President Hugo Chavez to get Castro talking.

Eventually the DJs told Castro he was on a Miami radio station, and he hung up.

The station told the FCC said the telephone rule didn't apply in this case because the United States has no diplomatic relations with Cuba. The agency did not agree and proposed the penalty.

## Jeremy Wensinger New Head of Harris Broadcast Unit

**MELBOURNE, Fla.** Apparently seeking to reenergize broadcast sales, Harris Corp. has chosen Jeremy Wensinger as president of its Broadcast Communications Division, and also replaced an executive in its Studio Products and Systems business.

Wensinger was vice president and general manager of Harris Technical Services Corp., part of the company's Government Communications Systems Division. He steps into a job that was held for more than six years by Bruce Allan, who recently resigned. Vice President of Transmission Systems Dale Mowry had filled the position in the interim.

Mowry also has been named temporarily to head the Studio Products and Systems business unit following the departure of Hal Wilson during the NAB spring show. Wilson had been vice president of that unit.

Of new president Wensinger, Harris Chairman/CEO said, "Jeremy has been instrumental in guiding the rapid growth of our Technical Services business to nearly \$200 million in revenue through successful pursuits and the award of new programs. He will be building upon a new organization structure to more effectively serve our broadcast customers and markets."

Larry Whitfield also was named president of Harris Technical Services Corp.

## Susquehanna Accounts for Ads

**YORK, Pa.** See spot run. But did it?

Susquehanna Radio Corp. says it wants to be proactive in the advertising accountability debate.

The broadcaster, noting concerns among advertisers and agencies about

whether and how spots actually run on the medium's stations, said it is responding with a "Sales Performance Guarantee." It spells out its responsibilities to clients and provides 2-for-1 make-goods within the contracted daypart of any spots that fail to air properly. The company also is setting up a 24-hour client hotline.

"Clients are guaranteed to receive promotional recaps within 10 days, consistent communication, lower commercial loads, relevant station and market updates, individualized creative marketing strategies and a superior professional relationship with account managers," it stated in an announcement by President and Chief Operating Officer David Kennedy.

## Stevens to Head Senate Commerce

**WASHINGTON** Arizona Republican Sen. John McCain will give up his Commerce Committee Chair at the end of this year but expects to remain on the committee. Republican Senators choose to have six-year term limits on their committee chairmanships, and McCain has reached that limit.

According to Commerce Committee spokeswoman Rebecca Hanks, Sen. Ted Stevens, R-Alaska, would take over the committee. This assumes the Republicans retain control of the Senate in the upcoming elections.

McCain hopes to chair the Telecom Subcommittee, although Hanks says no definite decision had been made on that assignment. What is certain, if the GOP retains the Senate, is that McCain, who also serves on the Indian Affairs Committee, takes over that chairmanship for one year in 2005 and then becomes chairman of the Armed Services Committee in 2006.

## MMTC Conference Set for July

**WASHINGTON** The Minority Media and Telecom Council presents its second "Annual Access to Capital Conference" July 19-20 in Washington.

The event includes a Hall of Fame Awards Reception on July 19. The event will be at the Loews L'Enfant Plaza Hotel.

For conference information, contact DeSane & Associates at (201) 342-0909 or e-mail MMTC at [MMTC2004@aol.com](mailto:MMTC2004@aol.com).

BCM 104 High Resolution Broadcast Microphone

# Think Of It As A Stealth Fighter For Your Voice

Introducing the BCM 104 Broadcast Mic from Neumann



Neumann has been doing a lot of listening lately. We've been listening to the radio, and what we've heard is that the world really does need a better broadcast mic. A much better one. Introducing the first Neumann mic built expressly for broadcast applications. Our new BCM 104 is a condenser mic that can handle any talent that's thrown at it, and make it shine. And best of all, it does it at a price that's "broadcaster friendly."

Gain the clear advantage - grab the new Neumann BCM 104, and discover what a difference Neumann can make for your voice.



**Neumann USA**  
The Choice of Those Who Can Hear The Difference

Tel: 860.434.5220 • FAX: 860.434.3148 [www.neumannusa.com](http://www.neumannusa.com)  
Canada: Tel: 514-426-3013. Fax: 514-426-3953 • Mexico: Tel: (525) 639-0956. Fax: (525) 639-9482

### Company: Narda Safety Test Solutions Product: Selective Radiation Meter



This is a handheld selective measuring device for safety analysis of RF and microwave electromagnetic fields.

You get a basic unit and a probe. The unit contains a spectrum analyzer for the range of 100 kHz to 3 GHz; it can be used with a triaxial Narda probe or with antennas from other suppliers. The triaxial probe allows non-directional measurements from FM up to W-CDMA and UMTS services.

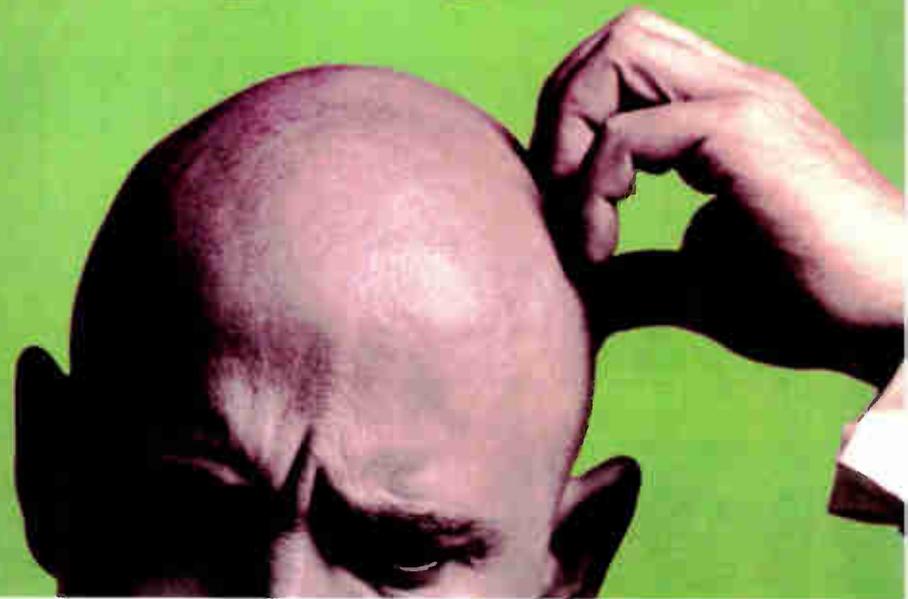
Results are in V/m, A/m, power density or percentage of permissible limit. It is battery-operated; results can be exported to PC for long-term storage if desired.

Info: (631) 231-1700 in New York, or [www.narda-sts.com](http://www.narda-sts.com).



# Wish you had more

up top?



## Announcing Omnia-6EX.

There's a lot of buzz about the new HD Radio codec. We've heard it and agree with the many others who like it and say it's now time to get on with radio's transition to digital.

Because HD Radio can transmit audio frequencies up to 20kHz, listeners will finally be allowed to hear the full CD spectrum – if their radio stations choose the right on-air processor. On this point, you should know something important: Some “HD” processors simply hack off everything above 15kHz... robbing listeners of the full HD Radio experience and keeping our industry in a fidelity backwater.

The new Omnia-6EX won't short-change your listeners. We've built Omnias with sampling rates of 48kHz and higher from the start. All along, we've needed the sampling headroom to keep analog FM audio grunge-free. Now it's essential for HD Radio. Even if some listeners wouldn't notice the missing high frequencies, there's a fair chance they would hear a sharp 15kHz low-pass filter operating within HD Radio's codec range.

Omnia-6EX is also full of processing enhancements that result in yet more bass punch, yet more voice clarity, than the original Omnia-6. A sound so powerful and free of artificial constraints, you'll crave it for your station the first time you hear it.

More than 50% of the US' Top 100 FM stations have already upgraded to Omnia. Maybe you're next?



*The new Omnia-6EX has enhanced processing for analog FM, and is ready for HD Radio with a second limiter section and digital output. Both FM and HD limiters and outputs are included as standard.*

**Omnia**  
A Telos Company  
omniaaudio.com

TECH TIPS

# Wireless, a Blissful Beautiful Thing

by Stephen Poole

Things move at a slower, more gentle pace in Alabama.

There are people here who will tell you that our state never actually surrendered after the Civil War — as if it matters.

Thus with some amazement I report that wireless networking has arrived here. We have wireless "hot spots" at local cafes and bookstores — even truckers can get into the act at the local Flying J Travel Center.

So given that Bandit, Snowman and the rest of the gang are wireless now-

days, and especially now that the prices are falling to ridiculously low levels, I recently decided that it was time to become Wireless Literate (capitalized out of reverence) myself.

My very first act was a mistake: I went to one of the equipment Web sites and looked at a Wireless Planning Chart (capitalized out of irreverence). There were diagrams filled with GeekSpeak. My head hurt.

## Simple concept

Hey, that stuff is fine, even required, if you're building a large, complex network for hundreds of people, especial-

ly if they're scattered all over creation. But all I needed was a way to share our Web connection and a couple of printers with our on-air talent.

Wireless networking is simple in concept; you replace the Cat-5 wiring with a radio link. In my case, this was especially appealing because it would help eliminate the tangle in our talk studios — and no more busted connectors three seconds before airtime.

All I needed was a single access point to accomplish this; I chose a Linksys BEFW11S4 as my test unit. It was purchased locally for \$70.

My experience follows. A lot this will apply to wireless in general, but I'm concentrating on 802.11b. It operates at 11 Mbps in the 2.4 GHz band and is by far the most popular (and least expensive) at present.

The Linksys was perfect for my needs. It had a built-in DHCP server to assign IP addresses, as well as a firewall and some other freebies, such as virtual networking — great if you have a separate Web or mail server on the same Internet connection. For my laptop, I picked up a no-name USB type at Wal-Mart for \$40. You can also get PCMCIA/Cardbus and PCI cards for the same price or less. Wireless networking is a bargain.

Linksys assumes that you'll use this particular model for a small- to medium-size network that shares an Internet connection, and its walk-through is adequate for that. In fact, if you have the usual dynamic DSL service, you simply power up the Linksys with the included wall-wart power supply, then hook to your DSL or equivalent connection. Configuration is via a simple Web interface.

## Keep it safe

My number one concern, of course, was security.



The author used a Linksys BEFW11S4 EtherFast Wireless AP + Cable/DSL Router w/4-Port Switch. It connects a wireless network to a high-speed broadband Net connection and a 10/100 Fast Ethernet backbone.

We had the firewall, but that wasn't enough. Wireless adds another layer of exposure. Bands of hackers in most cities "war drive" — they cruise around looking for wireless access. If they find a good spot, they'll make chalk marks on the pavement to alert their friends (visit [www.warchalking.org](http://www.warchalking.org) and see for yourself).

To avoid being "chalked," I did three things:

(1) I changed the SSID from the default,

(2) I used WEP encryption with a "strong" passkey (a mix of numbers and letters) and

(3) I limited my signal to only those areas that required service.

Wireless Equivalent Protocol encryption isn't foolproof; it can be cracked. But most hackers are looking for quick and easy Web access. My goal was to make it hard enough that they'd give up and move down the road. The strongest offered by the Linksys was 104/128-bit WEP, so that's what I used.

If you decide to go wireless, be warned: once your employees hear about it, they'll all want it. They'll only care that they get a good signal wherever they're at, too. And once you've tried it, you'll love it; you'll probably consider putting access points all over the place. I did, but quickly came to my senses.

## No free access

First of all, that would represent a needless expense, especially for desktop workstations on our existing wired network. Why fix it if it ain't broke?

But more important, a wireless signal that spills all over the place is the same as a network jack at the front of your building with a sign that says "Free Access!"

Our studios in the Goodwin Crest building are on the ground floor, so the ideal location was near WYDE(FM)'s main control room. It's in a basement, so I'm shooting the signal out of a cave. This tightly limits where the signal goes; I get good coverage in the talk studios, but don't spill into the parking lot.

One final caveat: WEP uses a password/key that is encrypted. If you use a plain-text ASCII key (reasonable, because it's easier to remember), you may find that different manufacturers don't encrypt that ASCII the same

See WIRELESS, page 16 ►

**Company: Tieline Codec Solutions**  
**Product: i-Mix G-3**

Calling it the world's first 15 kHz stereo POTS audio codec, Tieline unveiled the i-Mix G3.

Features include a new DSP platform and the promise of 15 kHz phase-locked-loop stereo over analog phone lines, or 15 kHz dual mono for sending program audio to two destinations (or use one channel for IFB) with an upgrade module. Wireless 7 kHz GSM and full-bandwidth stereo/dual mono ISDN are optional.

Features include six-input digital mixer, live caller and IFB control, dual mono or stereo ISDN, upgrade module slot, relay and remote control and optional digital router software. Retail price: \$4,495. Upgrade modules: \$850 each. Thus, a stereo configuration retails for \$5,345.

Darren Levy and Rod Henderson are shown.

Info: (888) 211-6989 or [www.tieline.com](http://www.tieline.com).



**Kintronic  Labs, Inc**

**OFFERING COMPLETE CONCEPT - TO - ON AIR SERVICES FOR DIGITAL AM RADIO**

**WIDEBAND ANTENNA TUNING UNITS, PHASING AND MATCHING SYSTEMS TO MEET CUSTOM REQUIREMENTS**



**THREE TOWER AM 50kW NDA-D / DA-N DIRECTIONAL ANTENNA SYSTEM**  
ST PAUL, MN.

**NEW "DLTU" SERIES SUPER WIDEBAND ANTENNA TUNING UNITS**



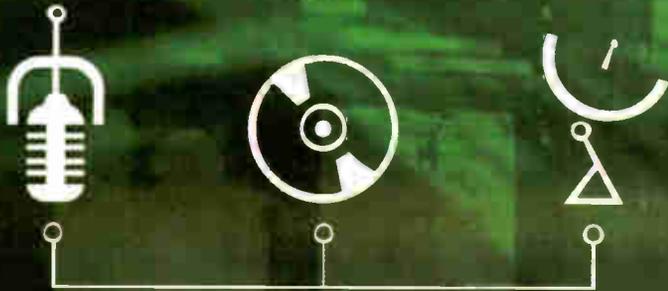
**DIRECTIONAL ARRAY ANTENNA TUNING UNIT**  
GAITHERSBURG, MD

Phone: (423) 878-3141 Fax: (423) 878-4224 Email: [kti@kintronic.com](mailto:kti@kintronic.com) Web Site: [www.kintronic.com](http://www.kintronic.com)

WBS

# ALFA

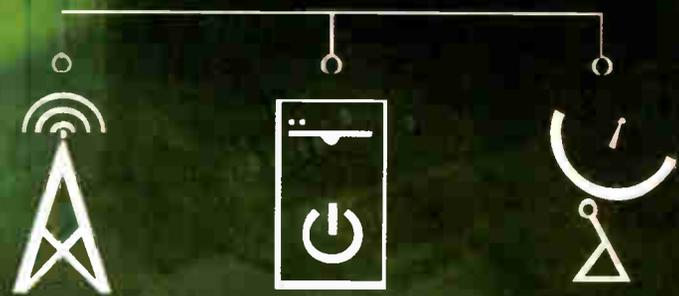
Manage Your Levels.\*



ingest



playout



**RADIO WORLD**  
2004 COOL STUFF  
AWARD WINNER



\* ALFA gives you total control of your digital audio signal levels. Adjust incoming levels automatically to your plant standard. Send signals adjusted to the correct level required at the destination. ALFA is designed to preserve the pristine quality of your signal. No artifacts, no distortion, no dropouts. Let us put you in control, call Ward-Beck today.



WBS

455 Milner Avenue, Unit 10  
Toronto, Ontario, Canada  
M1B 2K4

phone 416.335.5999  
toll free 800.771.2556  
www.ward-beck.com

ward-beck systems.

World Radio History

# Wireless

► Continued from page 14  
way. I tried a D-Link access point later and everything stopped working.

If this happens to you, check the obvious: make sure you're on the right channel and within range. Next, check your password. You may have to go to the access point, write down that long

problems and can add new ones, especially with security. It's a pointless expense if all you have is immobile desktop machines with an existing wired network.

But for PCs that move around, especially laptops, it's a blissful and beautiful thing. Give it a try!

*Stephen Poole is chief engineer for Crawford Broadcasting's Birmingham cluster. E-mail him at spoole@crowfordbroadcasting.com.*



Laptop with a wireless card installed, in WYDE's talk studio.

hex number and enter it manually. Great fun.

What's the bottom line? Wireless makes a useful tool. It doesn't solve all

*Have you solved a problem in a way that other radio engineers might want to know about? Write to us at radioworld@imaspub.com.*

# INNKEEPER PBX



## IT'S A 'KEEPER!

**INNKEEPER PBX** easily converts your multi-line PBX type telephone system into a professional, affordable production console. So simple, anyone can do it. Winner of Radio World's 2003 Cool Stuff Award.



**HOW-TO: INTERVIEW**

1. Connect the innkeeper PBX between the handset and base of your multi-line phone.
2. Connect your microphone and headphone (or headset) to the innkeeper PBX.
3. Connect the audio-output of the innkeeper PBX to your computer's sound card input and conduct the interview. Your computer/software captures the audio.

**JK Audio**  
REMOTE AUDIO & BROADCAST GEAR

Toll Free (USA & Canada): 800-552-8346  
Tel: 815-786-2929 • Fax: 815-786-8502  
www.jkaudio.com • info@jkaudio.com

**Company: Audemat-Aztec**  
**Product: Navigator 007 FM Field Strength Meter and Modulation Monitor**



Maybe Audemat-Aztec can do for U.S.-French relations what our politicians cannot.

The company has won an impressive series of awards over recent years, including several Radio World "Cool Stuff" honors, and it delivers again with an affordable FM metering tool, a field strength meter with a modulation/pilot/RBDS monitor. It comes with an external GPS receiver to do mobile RF surveys on a single FM station.



While driving, you can record RF readings and GPS coordinates on a laptop. After the campaign, results can be visualized as a text file and exported to mapping or predictive software.

Contract engineers and radio stations in small and medium markets can use it to check antenna system performances or modulation level, or when installing a RDS encoder. And you gotta love a French company that located its Paris headquarters on Neil Armstrong Ave. in the JFK Business Park.

Retail price is \$3,300. The company is taking orders for summer shipment.

Shown metering the company's success are Nicolas Boulay, Christophe Poulain, Sophie Lion Poulain, Remy Levilain and Louis Alpiste.

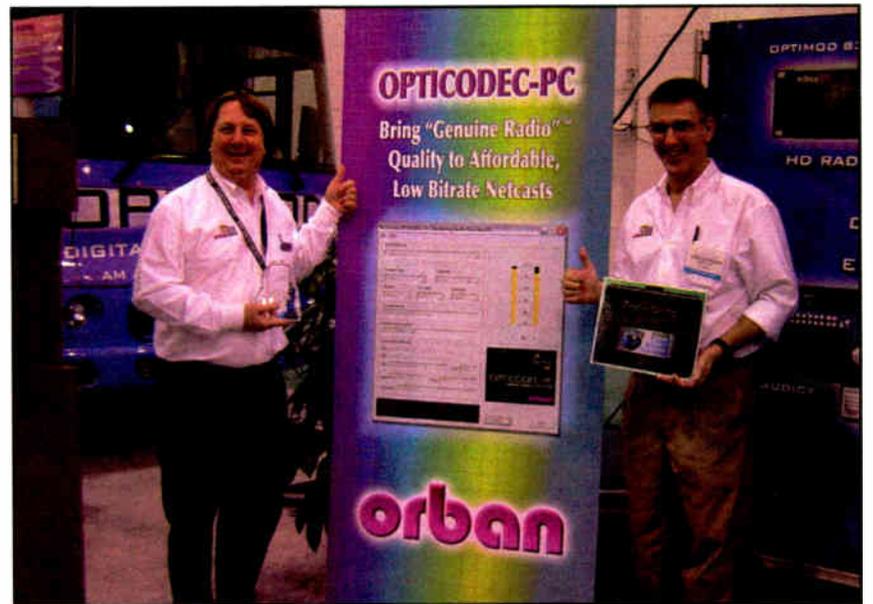
Info: (305) 692-7555 or www.audemat-aztec.com.

**Company: Orban/CRL Systems**  
**Product: Opticodec-PC**



Our judges were happy to see MPEG-4 aacPlus as well as AAC in this encoding software for streaming audio. The selling point here is that netcasters can have good sound at economical bit rates. At 32 kbps, the software streams close to FM quality; and "many listeners prefer the audio quality of 48 kbps streams to FM," Orban says.

Stations encoded with Opticodec-PC can be heard through the new RealPlayer 10 and can list themselves on [www.opticodec.net](http://www.opticodec.net), a directory service for Opticodec-PC streams.



This is available for Windows 2000/XP and supplies streams compatible with the Darwin Streaming Server. It comes in a \$99 LE version, which is compatible with good sound cards and which encodes one stream at bit rates of 8 to 32 kbps; and a \$1,995 PE version, a premium package that comes with an Optimod-PC and can encode multiple streams at 8 to 320 kbps. The Optimod-PC provides professional broadcast audio processing and includes mixing functions and other features.

Retail price: PE version with Optimod PC-1100 stereo audio processor, \$1,995; PE version for an existing Optimod-PC 1100, \$495; LE version, \$99.

Getting coded in the photo are Jay Brentlinger and Greg J. Ogonowski.

Info: (510) 351-3500 in California or [www.orban.com](http://www.orban.com).

# Workbench

Radio World, June 2, 2004

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

## On Towers, Rust Never Sleeps

by John Bisset

We've heard the phrase "out of sight, out of mind." Sometimes it refers to an abandoned AM site no one has time to visit. The tower field is a forest, air filters are clogged, rodents and insects have taken over the ATUs ...

And then there's the rusting tower.

Fig. 1 is almost unbelievable, isn't it? Up in the air, only the crows are wise to the



Fig. 1: Rust can form anywhere on a tower.

with questionable hardware — all of which Pinnacle had to correct, for DTV deployments. It acquired the property long after the rebuild.

By the way, like many readers, Michael scored 100 percent on identifying the tower problems we've shown in previous columns. He adds that for extra credit, you should count the transmission lines that are required to be painted, depending upon which FAA Advisory Circular the tower

item from Gary Timm, state coordinator for EAS in Wisconsin.

If you own a Sage Endec and haven't replaced your backup battery yet, it may be dying soon. Gary received a call from a Sage user with the date stuck on 1/1/95 and a start-up message "Time is bad." Replacing the battery fixed the problem. You'll find the instructions in the Sage owner's manual. Act now before you're blindsided.

If you're replacing batteries, don't forget the ones inside your transmitter controllers. On at least one brand, if the battery dies and the transmitter shuts off — say, due to a power failure or lightning strike — the transmitter will not remember the power level, and defaults to "0" watts.

After scratching your head awhile and then hitting the Raise Power button, everything returns to normal — until the next power failure.

I made it a practice to replace all batteries twice a year, when we were also setting our clocks forward or back an hour. Used batteries were recycled into my family's toys so they weren't wasted.

Don't forget the smoke detectors.

\*\*\*

Paul Sagi hails from the States but married a Malaysian physician and has transplanted to the Far East. He has enjoyed 27 years in electronics and now works in a radio complex of 27 studios housing seven FM stations, nine satellite stations and production facilities. Paul sends several tips.

The first is the most convenient yet inexpensive source of compressed air you will find. For removing dust Paul uses a sauce bottle, the kind of plastic squeeze bottle that restaurants use for ketchup.

To improve the sealing of the bottle, Paul coats the threads and top of the bottle with a little bit of silicone grease.



Fig. 2: Don't let coaxial cables obstruct the red and white painted tower legs.

A quick squeeze gives a strong puff of air. A paint brush used at the same time helps with stubborn dirt. Paul cautions us to use a face mask and goggles; the jet of air is powerful.

Do you know why you shouldn't use the squeeze bottle around high voltage? That dust cloud is conductive.

Here's a great tip for a contract engineer or tower rigger. One way to find air leaks is by the ultrasound they create. Paul advises that there are commercially available detectors to hear them.

Speaking of tracking down noises, do you know a nurse or doctor? Ask if you can

See WORKBENCH, page 20 ▶

problem.

Michael Millard from South Florida sends the picture, taken in his days as vice president of operations and engineering for Pinnacle Broadcasting. Seems Michael's group acquired a 1,400-foot tower of unknown manufacture. A little detective work revealed that the tower had been installed in the Carolinas but later moved to Texas.

The tower was reinstalled incorrectly, with some sections in the wrong places and

was FCC-registered to (Fig. 2).

Thanks to Michael for sharing another reason engineers should visit transmitter sites and why the tower needs to be climbed and inspected, top to bottom.

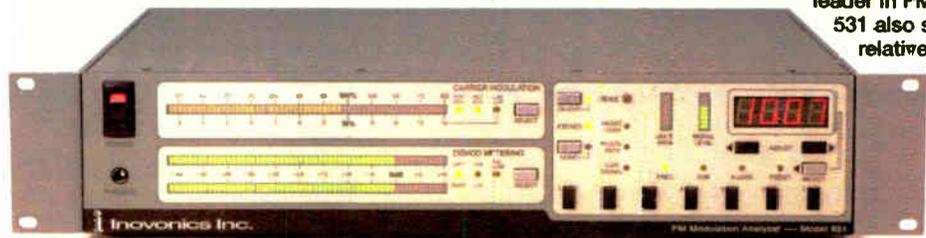
\*\*\*

Eric Hoehn works for XM Satellite Radio and was instrumental in coordinating EAS activity in the Washington market. He still monitors EAS issues and passes along this

## Top-Value FM Monitor Model 531 - \$2700

**THIS EASY-TO-USE FM MOD-MONITOR GIVES ACCURATE OFF-AIR MEASUREMENTS.**

A wealth of features makes Inovonics' second-generation 531 the undisputed value leader in FM monitoring. In addition to the high-resolution total-mod display, the 531 also shows stereo audio levels, SCA and RDS subcarrier injection, plus a relative indication of incidental AM noise. A digitally-tuned preselector with programmable presets lets you quickly compare your station's parameters with those of market companions.



Signal strength and multipath readouts simplify antenna alignment and help validate all measurements. Rear-panel appointments include balanced audio out, composite in/outs, and both antenna and high-level RF inputs. Alarm tallies are provided for overmod, audio loss, carrier loss and excessive multipath.

Go to [www.inovon.com](http://www.inovon.com) for full technical details.

**Inovonics**  
1305 Fair Ave. • Santa Cruz, CA 95060  
TEL: (831) 458-0552 • FAX: (831) 458-0554  
[www.inovon.com](http://www.inovon.com) • e-mail: [info@inovon.com](mailto:info@inovon.com)

# The Fundamentals of Supplementals

## Some FM Broadcasters Consider Their Options For Supplemental Audio Services on HD Radio

Last time we considered how new, legitimate music-download services are likely to erode radio-listening time further. Soon after that issue went to press, Apple announced some new features in the next generation of its iTunes service, some of which seem to put traditional radio usage even more squarely in the bull's eye.

One of these features is called iMix, which allows iTunes users to publish playlists of their favorite songs at the service's portal, so any other users can preview the music on the list. Other users then can rate the playlist, creating an Amazon.com-like community experience, which stimulates the discovery and subsequent purchase of new music.

if they desire.

So some opportunity for synergy with radio broadcasters exists — although it could be seen as simply providing a way to capture more radio listeners and convert them to iPod/iTunes users (or expand existing iTunes customers' usage of the service, at the expense of their radio listening time).

### Supplemental value

So how can the additional ("supplemental audio program") channels of service that the HD Radio FM system might provide help radio combat this drain on listenership?

Some FM broadcasters already have started planning for new, second services

years. And once HD Radio receivers include supplemental audio service capability, they will make great fundraising premiums.

More to the point in this discussion, supplemental audio services could open the door to the return of "marginal" music formats, or the development of new ones, as the advent of FM did in the 1970s with progressive/underground rock and beautiful music formats.

Some programmers have suggested that supplemental audio service could be considered along the same lines as online radio Webcasting, in that it will have a smaller but more proactive "seeker" audience, while main channels remain the domain of mainstream "surfers." In this way, supplemental audio channels can help radio remain more relevant in the face of emerging competitive services.

### The landscape ahead

It's also worth noting that while the supplemental audio service concept was instigated by NPR, it seems to be gaining broader traction among commercial broadcasters and, even more important, among regulators. The service specifically was targeted for comment in the FCC's recent Further Notice of Proposed Rule Making on digital radio, and cited as a significant part of digital radio's promise in that proceedings accompanying statements from Commissioners Powell, Adelstein and Copps.

Yet several key challenges remain to realization of supplemental audio service.

First is the fact that in the hybrid HD Radio format (which is likely to remain the only environment that broadcasters experience for the foreseeable future, at least on the FM side), supplemental audio only exists as a *datacasting* service. This implies that it is not covered in the basic license that Ibtiquity offers to broadcasters under standard terms. It remains unclear what, if any, additional royalties might be levied on stations that wish to implement supplemental audio services. It is likely, however, that these would not be prohibitive, and commercial broadcasters could be willing to pony up reasonable additional licensing fees, because this is one element of the system that could have some direct, measurable return.

Second, the consideration of supplemental audio as akin to Webcasting also

## The Big Picture

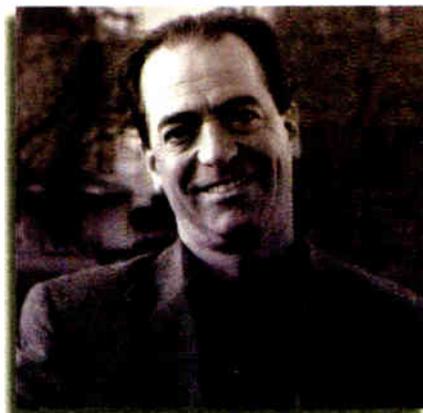


Photo: Garry Hayes, BBC

### by Skip Pizzi

could be taken by the record industry as an opportunity to seek new royalties on published music content used on the service, as it has succeeded in doing in the Webcasting world. Meanwhile, as noted earlier, the music industry is pursuing the establishment of consumer hardware limitations to recording and redistribution of content received via HD Radio services.

Another question is how widespread the ability to receive supplemental audio services will become among HD Radio receivers. It is certainly not included in first generation devices, but when and how available will it become? Will it become a mandatory part of the standard to support, as in DTV multicasting? This is unlikely, but recent comments from chipmakers indicate that it could become a de facto standard feature anyway, just as stereo has become among FM receivers.

Finally, the cited recent actions and statements from the FCC also hint that additional public-service or access requirements might be introduced if incumbent licensees suddenly obtain additional channels. This could create a disincentive among those broadcasters to implement supplemental services, so the resultant chilling effect would serve to harm the public service intention that motivated the proposal. This is another item on which the FCC seeks comment in its current digital radio FNPRM.

The resolution of these issues will weigh heavily on the deployment of digital radio in the United States, and the stakes are quite high. Although it may be difficult to recognize at this stage, supplemental audio functionality may ultimately become the most pivotal element to HD Radio's success.

Skip Pizzi is contributing editor of Radio World.

## Supplemental audio channels can help radio remain more relevant in the face of emerging competitive services.

Sounds an awful lot like what radio used to do, except that the result is more measurable. No wonder record companies are interested in these services. As a result, it may erode the music industry's interest in radio, too, just as new digital radio services are emerging.

This can only add fuel to that industry's current effort to limit listeners' access to storing music received via HD Radio.

Similar community-building features are appearing in other online music stores, so consumer (and record company) behavior thus engendered could likely become widespread, and eventually mainstream.

Meanwhile, Apple acknowledges that today's iTunes users are not exclusively downloaders. The service has added another new feature called *Radio Charts*, by which a radio station can submit its playlist to Apple for inclusion in an iTunes database. Listeners can search this database at the iTunes portal to identify what they heard on a participating station at a given time, then purchase the music

that would attract or retain audiences. Among these are full-time (or drive-time) traffic and weather services, niche news and information services (e.g., long-form network audio feeds from ESPN, CNN, C-SPAN, Bloomberg, BBC, NPR, etc.); second-language simulcasts (e.g., music or other programming is the same as that presented on the main channel, but DJ/spot breaks are provided in a second language); and completely independent foreign language services.

Some of the most creative thinking on supplemental audio services to date has taken place in public radio circles, stimulated by the NPR-initiated Tomorrow Radio project. Some public stations are developing second-service program schedules that counter-program their main services, as well as those of other public stations in markets where multiple public stations exist.

A few public stations also are considering a return to educational or public-service programming on their supplemental channels, content that has largely disappeared from public radio in recent

## "The Perfect Connection"

Manufactured with pride in the USA.

### JK Audio



**Broadcast Host** – Desktop Digital Hybrid  
For details go to [www.jkaudio.com](http://www.jkaudio.com)

The JK Audio Broadcast Host digital telephone hybrid, teamed with the Broadcast Tools® TeleSwitch 6 six-line call director, provide everything you need for a high-quality, 6-line broadcast telephone system.

FREE call screener software, TeleSwitch 6 connection cables and instructions included.

**Contact Your Broadcast Equipment Supplier Today and Ask for a Package Quote!**

### BROADCAST tools inc.



**TeleSwitch 6** – Six-Line Call Director  
For details go to [www.broadcasttools.com](http://www.broadcasttools.com)

You've Got To Hear This!



HARRIS  
**extreme digital...**  
RADIO

[www.broadcast.harris.com](http://www.broadcast.harris.com) • 1-800-622-0022

# OPTIMOD-FM 8300

new from the worldwide leader in broadcast audio processing



## ADVANCED FM AUDIO PROCESSING MADE AFFORDABLE

Optimod-FM 8300 uses technology from Orban's flagship 8400 to achieve competitive performance that's unexpected in a mid-priced FM processor. With the 8300, your signature sound is just a preset away.

An easy, one-knob Less/More adjustment allows you to customize any factory preset. Exceptional versatility allows you to adjust the processor's audio texture to brand your sound,

knowing that the resulting signature sound will remain consistent, cut to cut and source to source. Branding builds businesses and no other processor has the consistency to brand your sound like an Orban OPTIMOD.

For more detailed information please contact:



Southern Coastal  
Marketing Services, Inc.

10201 Rodney Blvd., Pineville, NC 28134  
Sales: +1 800 438-6040, Fax: +1 704 889-4540  
E-mail: sales@scmsinc.com

or we invite you to visit [www.scmsinc.com](http://www.scmsinc.com)



You've Got To Hear This!



HARRIS  
**extreme digital...**  
RADIO

[www.broadcast.harris.com](http://www.broadcast.harris.com) • 1-800-622-0022

**Company: Shively Labs**  
**Product: Interleaved Analog-Digital Antenna System**



Usually a product must be new to be considered for a Radio World "Cool Stuff" Award. But this product was out well before most of the market was ready for it. Now that IBOC is being implemented more widely, our judges recognized Shively for setting the pace in the interleaved niche.

The system allows a broadcaster to implement IBOC in the same aperture as its existing analog antenna. The IAD method of mounting digital bays on the analog feed lines while maintaining separate inputs minimizes analog and digital losses and meets FCC requirements for dual antennas.



Shively says the method "guarantees identical analog and digital azimuth patterns, critical to FCC approval for directional systems, and not always possible with side-by-side interleaved antennas." The ring stub design, it feels, provides superior azimuth pattern control compared to helical and side-mounted panel-style radiators.

Pricing varies based on application. Edd Forke and Jerry Hill don't stand on ceremony, celebrating the award. Info: (888) 744-8359 or www.shively.com.

**Company: Comrex**  
**Product: STAC Studio Telephone Access Center**



Talk shows have been around for a while — all the more reason to update the paradigm for talk management products.

Available in 6- or 12-line configurations, this call management system comes in a swooshy ergonomic package that contains two digital hybrids that can conference four callers.



The system works as a Web server, providing remote control and call screening access from a browser. A control surface ships with each system; and up to four surfaces with backlit buttons can be used. These can be set as limited-function screener surfaces or for full on-air control.

An "auto attendant" feature answers callers with a custom message and puts 'em on hold. Features include "busy all" for contests, "next" for fast-paced operation, VIP lines and a headset jack for hands-free screener program-on-hold.

Ships in late summer. Retail: \$3,200 (STAC6), \$3,900 (STAC12)  
 Photo: Andy Denoncour, Tom Hartnett, Kris Bobo and Lynn Distler staff the phones.  
 Info: (800) 237-1776 or www.comrex.com

**MONITORING TO THE POWER OF 8.**

**The ultimate audio monitoring card. Times eight.** Broadcast monitoring is more important than ever. AudioScience makes it easier than ever with the amazing ASIS8702/8703 8-channel tuner adapter boards. Now you can monitor, log, verify ads and identify content on 8 audio channels simultaneously from just about any source: AM, FM, even TV (ASIS8703). An onboard 225Mhz DSP processes the audio and routes it out thru DB-9 and 50-pin connectors. Drivers for Windows 2000, XP and Linux are available. Need even more power? Let us custom-configure tuner and DSP options for any application. Call us at +1-302-324-5333 or go to www.audioscience.com.

**BUILT FOR BROADCAST**

**AUDIOSCIENCE**  
*Sound Engineering. Same Excellence.*

# Workbench

► Continued from page 17  
 obtain one of their old stethoscopes. Pinpointing funny noises inside a transmitter, or a car engine for that matter, is a snap with such a directional listening device. (Editor Paul McLane adds that you might also get more respect from your co-workers if you walk around the station wearing the thing.)

In the Feb. 1, 2003, *Workbench* we wrote about the "very high static voltages that can

Sometimes he finds that oxide deposits on the capstans adhere too firmly to be removed by the usual solvents. In such cases, he uses a narrow brass strip to scrape off the oxide. The brass is hard enough for the purpose but soft enough not to damage the capstan.

Now that Flash memory sticks or pen drives are so inexpensive, Paul attaches one to his company ID tag. The memory stick contains telephone numbers, useful information on equipment, useful Web sites, a DSP book and other electronics data. He only needs to insert the pen drive in a USB port of a PC to access the information.



Fig. 3: On most solid-state transmitters, critical backup settings are kept 'alive' with a backup battery. Make sure it's fresh.

develop across the base insulator of a tower, even with clear blue skies. All that's needed is a little wind and relatively dry air. The conditions will produce a pretty good jolt for no apparent reason."

Paul Sagi suggests using a discharge/grounding stick to ensure the tower is grounded, before applying the battery jumper cable to ground.

His studios use a lot of DAT machines.

Reach Paul Sagi at pksagi@astro.com.my. John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is northeast regional sales manager for Dielectric Communications. Reach him at (571) 217-9386 or john.bisset@dielectric.spx.com.

Submissions for this column are encouraged, and qualify for SBE recertification credit.

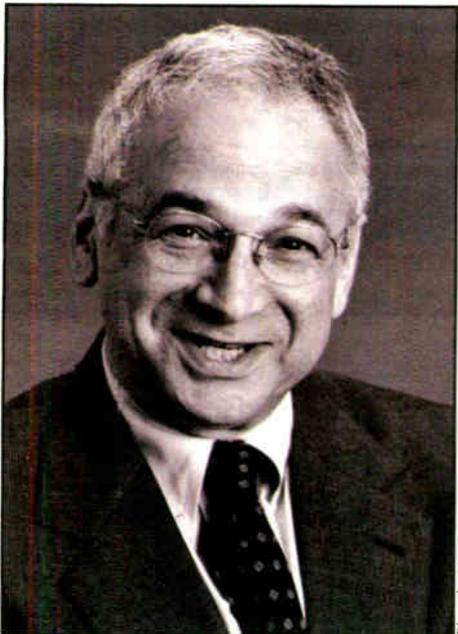
## Defining Ethics and Fairness at NPR

*The Network Updates Its In-House Ethics Guide for Public Radio Journalism*

by Peter King

NPR has updated its in-house ethics guide, last revised in 1995. The new version is called "Independence and Integrity II: An Updated Ethics Guide for Public Radio Journalism."

NPR Ombudsman Jeffrey Dvorkin says much has changed in 10 years, especially with the advent of online journalism and digital technology.



Jeffrey Dvorkin

Also, "I think NPR felt that as a public broadcaster, it had an additional obligation to set some standards, both for the system as a whole and for listeners, so they can know what we stand for and judge us by it."

The guide gets a thumbs-up from journalist Pat Duggins, news director at pub-

lic station WFME(FM) in Orlando, Fla., and NPR's resident expert on space. He says he was "enthused" by progress reports while the guide was being written, and it has not disappointed him.

"Now we've got FTP, the Internet ... it's amazing how fast the world's changing."

### Standards

The guide stresses the importance of system-wide standards.

"We've become a little more mature about the need ... so we're able to be a little more directive without imposing the will of big stations on the small ones, or NPR on its member stations," Dvorkin said. In that sense, NPR is more like a "trade organization" than a traditional network, he said.

The guide was written with the help of public radio general managers, news directors and producers at the local and national levels.

"We also had help from academics, and legal advice," said Dvorkin, who described the process as "a year-long talk fest to get a sense of the most important and pressing issues that bedevil the system on a daily and ongoing basis."

The process culminated with a meeting at the Poynter Institute, a journalism school in St Petersburg, Fla. The sessions left an impression on Dvorkin, who said, "I think there's a real hunger among journalists, producers, program directors and station managers to talk about ethics. It's so important to us; and of course, in the rush to deadline, we never get a chance."

The guide occupies about 30 pages. While some of the topics seem elementary, Dvorkin says it's important that they be addressed. Nearly a third of the guide is devoted to "fairness, accuracy and bal-

ance" and the importance of basic principles such as "fact-based reporting" and journalists serving communities by seeking the truth in their daily work.

The text states, "Public radio journalism aims to be impartial and independent; special care must be taken to ensure that those who seek to influence the news are not given special access. Journalists must act ethically to serve their audiences' best interest."

A six-page section deals with the "core values" of news programming, written in 2001. It includes information drawn from listener research ("Core public radio listeners draw a clear line local information they can get from other

sources ... and coverage that gives them knowledge, understanding and makes them think."); it stresses the importance of local newsrooms adhering to NPR's example ("There is no advantage in local origination if the presentation is below network standards.").

The section stresses accuracy, reliability, accountability, fairness, dignity and privacy ("This is especially important when it comes to reporting on tragedy and trauma."); it discusses the reliability of sources ("The very act of reporting a claim on public radio may confer upon it a sense of legitimacy. We should not broadcast information from untrustworthy sources ... While routine stories may occasionally be based on a single official source, significant or controversial stories should

See ETHICS, page 23 ►

**Company: MicroGen Electronics**  
**Product: TS9000 FM Broadcast Analyzer**



A cost-effective FM mod monitor that does its calculations on a PC, this product is made by MicroGen, based in London, and was exhibited by Broadcast Warehouse, its distributor.

It is an FM receiver and modulation analyser (that's how they spell it on the other side of The Pond) that runs from and is powered by a USB port, allowing on-site or mobile monitoring. It samples the multiplex signal at 240 kHz before passing info over USB to the PC, where measurements and calculations are performed in Windows software. It covers 87.5 to 108 MHz in 10 kHz steps, with an attenuator of -10/20/30 dB for high signal strength areas.

The unit can be used to inspect modulation level, pilot, RDS and SCA sub carriers. Transmitter RDS data streams can be analyzed and used as a source for debugging RDS encoder setup. Modulation histograms and other logging facilities are available so you can see changes over time.

The company says it's the first FM broadcast analyzer to show users the FFT of the complete composite multiplex signal out to 100 kHz. Features include antenna, MPX and IF inputs, and balanced XLR and headphone outputs. Click-and-drag tuning lets it be used as an on-air tuner or single-channel modulation analyzer. Retail price: \$1,800.

Scott Incz of Broadcast Warehouse Ltd. is pictured.

Info: (888) 866-1671 or [www.broadcastwarehouse.com](http://www.broadcastwarehouse.com).



## Attract and Keep Listeners.



WINNER 2001  
Radio World  
Cool Stuff Award

You won't keep 'em with all knobs set to '11.' But you won't get 'em with everything set to '3,' either!

When your program audio needs it, *Ariane's* intelligent adaptive control steps in, at '11' if need be, to take care of business. And when the programming sounds like it's *already* been processed at '11,' *Ariane* automatically dials back a few notches...

All the back way to '3,' or even '0' if need be. Powerfully, unobtrusively, intelligently.

We set 'em up... *You knock 'em down.*

TRANSLANTECH SOUND, LLC

Sound Processors and Broadcast Sound Consultation • <http://www.translantech.com> • email: [Sales@translantech.com](mailto:Sales@translantech.com) • New York: (212) 222-0330 • Europe: +49 2361 9049 649

©Copyright 2004 TransLanTech Sound, LLC

# OPTIMOD-FM 8300

new from the worldwide leader in broadcast audio processing



## ADVANCED FM AUDIO PROCESSING MADE AFFORDABLE

Optimod-FM 8300 uses technology from Orban's flagship 8400 to achieve competitive performance that's unexpected in a mid-priced FM processor. With the 8300, your signature sound is just a preset away.

An easy, one-knob Less/More adjustment allows you to customize any factory preset. Exceptional versatility allows you to adjust the processor's audio texture to brand your sound,

knowing that the resulting signature sound will remain consistent, cut to cut and source to source. Branding builds businesses and no other processor has the consistency to brand your sound like an Orban OPTIMOD.

For more detailed information please contact:



Southern Coastal  
Marketing Services, Inc.

10201 Rodney Blvd., Pineville, NC 28134  
Sales: +1 800 438-6040, Fax: +1 704 889-4540  
E-mail: sales@scmsinc.com

or we invite you to visit [www.scmsinc.com](http://www.scmsinc.com)



# Ethics

► Continued from page 21

be based on more than one source.”). And it deals with depth, context (“Public radio journalism should avoid oversimplification of stories.”) and conflict of interest, with seven bullet points and eight questions journalists should consider.

Two pages are devoted to online journalism, covering streaming audio, Web logs or “blogs,” links and online forums.

“We wanted to create a mindfulness about ethical decisions and journalism. Not that journalists in general ... are unethical, but we’re kind of ‘inethical.’ We don’t talk about it enough, and so it often doesn’t become a conscious ele-

ment in our decision-making process of how to do stories,” Dvorkin said.

Since publication, he’s received numerous phone calls and e-mails from journalists who’ve been reminded of situations that have occurred at their stations.

“We’re now able to help each other more,” Dvorkin said. “Everyone becomes kind of an ethical sounding board.”

WMFE’s Duggins agrees but adds that managers need to continue to assume responsibility for their on-air product, leading by example. He says he tries to ensure that reporters doublecheck their work for multiple sourcing and fairness.

The story’s important, he says, but so is the human element.

“Remember, you can ruin lives, you can ruin careers. Be very careful how you do this. The media can be a weapon, and you can really hurt people if you’re not

careful with it.”

Dvorkin was vice president of news for NPR for three years before becoming the organization’s ombudsman, its link to listeners. He said that being on the firing line is “mostly the most interesting journalistic job I’ve ever had. It’s the best job in journalism most of the time; a couple of days a month it’s the worst job in journalism.”

### Best and worst

The worst days include “being hammered by organized pressure groups ... and when we’ve made a mistake and deserve to take our knocks. People are very brittle and anxious and angry, and their tolerance of what that think of as ‘the wrong opinion,’ errors or what they think is a deliberate attempt to spin the news ... People have a low tolerance for

the ordinary mistakes of journalism. ... And that has made the pressure on journalists overall much more intense than I’ve experienced in more than 30 years in journalism.”

How about the conservative perception that NPR tilts to the left? Dvorkin says NPR and all journalists need to better communicate what journalism tries to accomplish. He believes some listeners confuse fact-based reporting with commentary or opinion, all of which are NPR staples. And he says NPR has to do a better job of differentiating reporting from commentary.

Dvorkin says he receives about 1,000 listener e-mails per week, positive and negative.

“People are more motivated to complain than praise, but we do get kudos from time to time.”

## In Pursuit of Fairness, Accuracy and Balance

The following is an excerpt from NPR’s “Independence and Integrity II: An Updated Ethics Guide for Public Radio Journalism.”

✓ Have the people affected or harmed by the story been given ample opportunity to reply? If harm is inevitable, have I sought to minimize it where possible?

✓ Have I provided listeners sufficient background context to understand the story fully? Are there major questions left unanswered? Is there anything I know that I am not telling my listeners, which, if they knew it, would change their view of the story?

✓ Might my personal feelings have affected my handling of this story in any way? Do I have relationships with sources or subjects that would compromise my ability to cover the story fairly, or allow someone to claim my ability was compromised?

✓ How confident am I about the credibility of this information? Do my sources have vested interests in getting this information out? Is there a disinterested, independent source of this information with whom I could check?

✓ If I am using anonymous sources, is there another possible source of the information? Can I make a compelling case to my listeners for using the anonymous source?

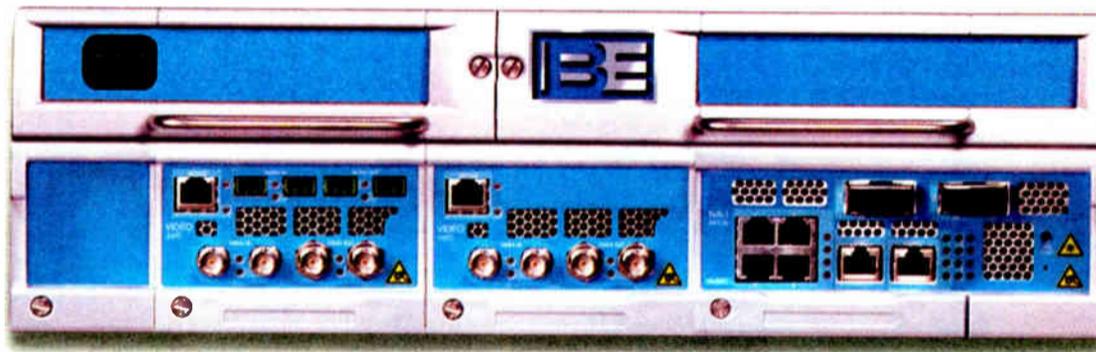
✓ Have I attributed, documented and double-checked all the basic facts of the story? Did my tape editing distort the essence of the actuality or of the event?

✓ Have I sought out all the relevant points of view of the story, and avoided creating “artificially polarized” sides? Have I edited the story so that all sides are heard, and in proportion to their importance to the story?

✓ Am I presenting the news and views of all segments of the community I serve? Do I continue to “round up the usual suspects” in choosing sources, or have I brought in new sources with new perspectives?

✓ Does the diversity of our staff match the diversity of the community?

✓ If broadcasting a “subjective” program with a point of view, have I let my listeners know?



## Big Pipe: This is not your father's STL.



Big Pipe is not just another studio-transmitter link. With scalable, bidirectional capabilities up to a whopping 45 Mb/s, you can interchange analog and digital audio, HD Radio data, Ethernet, serial data, video, and telephony via a wireless or wireline path. Scalable, flexible, and reliable, Big Pipe works just as well for studio facility interconnects and many other media transports needs. Because it comes from BE, you know that Big Pipe is designed for the realities of radio, including tight budgets and rock solid performance. Contact BE for details.



Broadcast Electronics, Inc. • 4100 North 24th Street, P.O. Box 3606, Quincy, Illinois 62305-3606 U.S.A.  
Telephone: (217) 224-9600 • Fax: (217) 224-9607 • E-Mail: [bdcast@bdcast.com](mailto:bdcast@bdcast.com)

Broadcast Electronics and the BE logo are registered trademarks of Broadcast Electronics, Inc. HD Radio is a registered trademark of iBiquity Digital Corporation

# Save on top sellers from



If you've called BSW before, you already know about our friendly, knowledgeable sales reps, many with dozens of years in the audio trenches. If not, find out today! Call 1-800-426-8434 and let us offer expert help with your equipment purchase.



## Profanity Delays: You Need 'Em, We Got 'Em!

The Eventide BD500-100 is an affordable solution for keeping profanities off the air. It features 20 seconds stereo delay time and Eventide's patented automatic catch-up circuitry. It also allows you to divide the total available delay time into several discrete segments to protect against multiple obscenities that occur in succession. Your station needs one today and BSW has them on sale!

BD500-100 List 3,395<sup>00</sup> **Call** **Eventide**



## Update Your Master Clock/Timers

Radio Systems clock/timers can run alone or connect as slaves to displays with optional built-in master clocks for studio synchronization. CT2002THIN and CT2002DESK can run stand-alone or as slaves and feature .56" high digits and are 7" wide x 2.5" tall. CT2002LARGE features 2.3" high digits and is 15" wide x 5.25" tall. All feature front mode switches for on-the-fly clock/timer selection.

CT2002THIN List 135<sup>00</sup> **119<sup>00</sup>** CT2002LARGE List 395<sup>00</sup> **349<sup>00</sup>**  
 CT2002DESK List 175<sup>00</sup> **149<sup>00</sup>**



It's almost summer here in the Pacific Northwest, and everyone starts kayaking to work around this time of year. Don't get too jealous - Seattle traffic is awful. It's not easy dodging those giant cargo containers and ferries across the Sound.



World Radio History

*Telos*

## Last Chance for Bundle Pricing - Order Now!

Telos' Xport/Xstream combination is a perfect, trouble-free way to cover any remote event that comes your way. By buying the rackmount Xstream studio codec and the POTS-only Xport field codec with BSW's limited-time special bundle pricing, you save over \$1800.00!

You'll get the best-selling Zephyr Xstream for your studio, and the satisfaction of knowing you can make CD-quality ISDN connections to virtually anywhere using industry-standard MPEG Layer 3 or AAC coding. And for your remote kit, the award-winning Xport has a built-in two-channel mixer - perfect for sponsored remotes, sporting events, interviews and live appearances. Just plug in to any POTS phone line for an aacPLUS link to your Xstream back in the studio, and you'll get stunning audio and rock-solid connections.

BSW has special pricing on this limited-time bundle! Call today and talk to your sales representative for more details and to get in on this fantastic deal. Offer expires June 30th, 2004.

XPORT-XSTREAM List 6,850<sup>00</sup> (if purchased separately)

**Call**



**SHURE**

**NEW**



## Shure SLX Series - Powerful and Affordable Wireless

Shure's rugged new SLX Wireless Systems can be set up quickly with innovative features such as Auto Frequency Scan and Auto Transmitter Setup. Exceptional wireless clarity and legendary Shure capsules make it a superior UHF wireless solution. Besides the Auto Frequency Scan, the receiver features 960 selectable frequencies across 24 MHz bandwidth, detachable 1/4 wave antennas, microprocessor-controlled diversity, RF presence LED and a 5-segment audio meter. With the included rack hardware it's ready to go right out of the box.

The popular SLX24/58 handheld system features the popular SM58 cardioid dynamic microphone capsule.

A lavalier/bodypack system is also available (SLX14/85).

SLX24/58 List 850<sup>00</sup> **599<sup>00</sup>**

SLX14/85 List 931<sup>00</sup> **659<sup>00</sup>**



**NEW**



## New Dual-Lens Vertical On-Air Light

This 'classic' dual-lens ON AIR warning light easily mounts next to studio doors and can be seen from either direction. Built using traditional sand casting methods, the attractive aluminum housing is then buffed to a bright finish. Behind the plexiglass "ON-AIR" windows is a long life lamp available in 120V AC (also available are 24V and 12V AC/DC). The whole unit can be easily installed on a standard 2 gang j-box.

ONAIR2 List 360<sup>00</sup> **319<sup>00</sup>**

SE

MD4  
FRE  
- Ex  
from

This re  
broadcast  
reproduct  
outstandi  
frequency  
kHz. Besi  
construct  
position b  
pattern. I  
shockmov  
your pure

MD42111



Comp  
Audio

Henry E  
can be inst  
personal c  
and meter  
production  
4 mixing c  
is a Proces  
and a prov  
in telecou  
standard F

STUDIODE

# Join your friends at BSW



Save Over \$1,800.00 in Bundle!

**BROADCAST tools inc.**

**JK Audio**

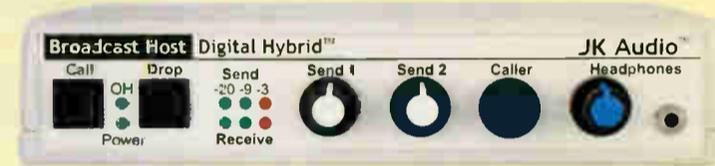
## Amazingly Affordable 6-Line Telephone System

Here are two products that create a complete 6-line telephone system: the Broadcast Tools TeleSwitch 6 call director and the JK Audio Broadcast Host digital telephone hybrid. Together, they provide everything you need for a high-quality talk show system. You also get free call screener software, TeleSwitch 6 connection cables and full instructions.

The TeleSwitch 6 interfaces up to six telephone lines. Lines can be answered, placed on hold, busied out and routed to a telephone set and/or the hybrid.

The Broadcast Host digital hybrid maintains excellent separation between your voice and the caller's. The stereo output provides your voice on one channel and the caller's voice on the other. The XLR output contains only the caller's voice.

**Special Bundle Pricing on the Pair!**



TS6-HOSTPKG List 1,554<sup>00</sup> **1,269<sup>00</sup>**

**SENNHEISER**

## MD421ii with E Shockmount Exclusively at BSW

Owned dynamic mic offers warm tonal balance of lows and strong high-end with a frequency response of 30 Hz to 17 kHz. Features the very rugged Sennheiser MD421ii features a five-position roll-off switch and cardioid pickup pattern. BSW also includes the MZS421 suspension mount (a \$50.00 value) and stand clamp FREE with purchase! Order today.



**FREE Shockmount**

List 485<sup>00</sup> **329<sup>95</sup>**

**ALESIS**



## Rackmountable 12-Channel Mixer at a Great Low Price!

Looking for a rugged rackmount mixer for production studio or remove truck? This Alesis MultiMix 12R is a 12-input, 2-buss analog mixer featuring 8 mic preamps with 2 stereo line channels, all in a compact, 3-U rackmount configuration. It offers a 2-band, fixed frequency EQ on each channel, 1 pre-fader aux send and

1 post-fader aux send per channel, and 60 mm faders for master level of each channel. The master section features an external stereo aux return level, stereo LED bar graph meters, stereo master L/R bus 60 mm fader, and a separate phones/monitor level control.

MULTIMIX12R List 399<sup>00</sup> **299<sup>00</sup>**



**HENRY HE ENGINEERING**

**NEW**

## Computer Stereo Interface

Henry Engineering's StudioDrive Audio Interface is designed to be installed in the drive bay of a computer to provide the control, mixing, monitoring and recording functions that are essential to a broadcast studio or recording suite. StudioDrive accepts up to 6 audio sources via 6 channels. The mic input is optimized for studio mics. There is an Insert jack to accommodate external mic processing, provision for an external "cough switch". There is also a built-in filter for recording audio (news feeds, actualities) from a radio OTS line, broadcast monitoring system and much more.



List 495<sup>00</sup> **539<sup>00</sup>**

**DENON**

## Cart-Style Broadcast CD Player

The DN961FA is a robust drawer-loading CD player. Once a CD is in the play mode the DN961FA's eject button is disabled, so no accidents occur while the unit is on the air. All the necessary features are there, including: instant cueing aided by a select dial; audition function; single or continuous play; digital display showing remaining or elapsed time in seconds and frames; end monitor feature allowing you to preview the ending of a cut; and complete remote accessibility.



DN961FA List 1,599<sup>00</sup> **Call**

BSW offers package pricing • Let us save you money on your next quote

**800 • 426 • 8434 or online @ www.bswusa.com**

Broadcast Supply Worldwide.  
Your Best Source for Professional Audio Products.



World Radio History

# Radio Boosts Homelessness Awareness

by Ken R.

He's just "Nobody." But "nobody" can do more than you might think.

This winter, some 80 non-commercial stations carried a live 14-hour marathon to promote awareness of the homeless in the country.

Organizer Jeremy Weir Alderson, who uses the name "Nobody" on the air, pulled the effort together with donations, cooperation and a lot of hot coffee.

"We held this seventh annual event in Cleveland this year, but it was broadcast nationally," Alderson said. "Our host station was WRUW(FM) at Case Western Reserve. There was also a Canadian marathon with its own stations and we linked up with them for an hour on the air."

This year's marathon, as in years past, featured voices of the homeless themselves. With a panel discussion called "Over Hill Over Dale, We Will Hit the Garbage Pail," and various selections of street poetry, it was not your typical public affairs program.

In the 14th hour, Keisha, a formerly homeless mother who's trying to help other women, said, "My heart aches when I have phone calls that I can't help the people that are on the streets with their kids. I get so many calls, if I can't help them and there's no shelter space, I sit and I pray with them on the phone, because that's all I can do."

## Lighting the fire

Alderson, who was himself homeless for a period, has a strong interest in the roots of this social condition.



Angelo Anderson, left, formerly homeless and now a counselor and outreach worker with the New Life Community in Cleveland, talks with organizer Jeremy Weir Alderson.

"We didn't have homeless people when I was growing up in Manhattan. It's tragic that this younger generation thinks this situation is normal. It's not normal," he said. "It's purely an economic issue. Cities have torn down low-cost housing to make stadiums, and they never wondered what would happen to these dispossessed people. Some of the homeless might be drunk or mentally ill, but at least they used to have somewhere to live. As a society we are not facing what we did, and we did plenty."

Remote broadcasts, especially nationally syndicated ones, cost money. Where

did those dollars come from?

"Money? We never know where it's coming from," said Alderson. "We work like crazy and somehow the money

shows up. We're getting a \$3,000 grant from The Cleveland Foundation, and WRUW was kind enough to help with some of the expenses. We sell recordings of the broadcasts to libraries, but it's all by hook or by crook. None of us are paid."

Alderson did not solicit money on the air.

"We are involved with consciousness raising, not fund raising," he stated.

The program was made available at no cost to stations via National Public Radio and Pacifica satellite feed, along with an Internet stream available to the public.

## Tech talk

Comrex Corp. and Telos Systems provided equipment and support, which helped to make the broadcast possible.

Cleveland contract engineer Mark Krieger oversaw the technical side of this marathon.

"The uplink to NPR's east coast facility was via ISDN on a Telos Zephyr Xstream ISDN Transceiver. We ran a Comrex Matrix audio codec to get feeds from other stations."

A list of stations that aired the program, and information about future events, can be found via [www.homelessnessmarathon.org](http://www.homelessnessmarathon.org) or e-mail [jlockha1@maine.rr.com](mailto:jlockha1@maine.rr.com).

## Company: ENCO Systems Product: Gardien Indecency System



What if you could install an automatic system that monitored your >bleeep< program material, and bleeped, muted or reversed specific offending words?

That's what Gardien does. ENCO was already using speech-recognition technology for a TV captioning product; a few weeks before NAB, it realized it could turn this into an automated >bleeep< removal device, and it was a definite buzz item at the show.

The system uses speaker-independent, neural network-based speech-recognition technology to monitor a program chain. It injects a short delay and identifies a set of indecent words or phrases that you define (cuss words, or your competitor's call letters!), replacing them with mute, bleep or reverse audio; then it logs the >bleeep< offending occurrence. Or it can log occurrences but take no action.

Gardien is meant to protect broadcasters from inadvertent >bleeep< by announcers, guests or phone callers without the program disruption of a traditional delay dump. Speech recognition is necessarily imperfect and dependent on many factors; but the company expects a 95 percent or above successful rate.

(We like the name Gardien, although we note that the company also has a site called [www.bleepinator.com](http://www.bleepinator.com).)

Retail price: \$9,995. Shown are Don Backus, Jon Earley and Roque Wood.

Info: (800) 362-6797 or [www.enco.com/gardien](http://www.enco.com/gardien).



## Company: DAWNco Product: Handymeter-Sat



This analyzer will help you find satellites and aim dishes, even when there are no analog channels.

It's a handheld, battery-operated satellite spectrum analyzer that handles 950-2150 MHz and costs \$1,500 retail. It includes a spectrum analyzer display with 50 dB dynamic range and a digital MPEG2 channel identifier.

It has built-in memory of satellites with their channel arrangements, which you can update. The unit weighs about two pounds. Options include a carrying case and PC software.

Info: (248) 391-9200 in Michigan or [www.dawnco.com](http://www.dawnco.com).



## STATION/STUDIO SERVICES

SUMMER SAFETY TIPS • FATHER'S DAY • INDEPENDENCE DAY ("FOUNDERS OF OUR AMERICAN REPUBLIC") • MORE!

WE PROVIDE *Ready-to-Air* Business Boosters. YOU PRESENT THEM TO CLIENTS....



...AND BUSINESS GETS BETTER!

Something New to Sell Every Month!  
HOLIDAYS • SEASONAL EVENTS • FRESH IDEAS!  
RETAIL SALES BOOSTERS • SAFETY CAMPAIGNS

:30- and :60-second features

GRACE BROADCAST SALES  
Toll-free 1-888-472-2388  
Sound Ideas for Building Business<sup>SM</sup>

FREE DEMOS & SALES TIPS!  
[www.gracebroadcast.com](http://www.gracebroadcast.com)

**SUPPORT OUR TROOPS**

**FREE SALUTES available now**

[www.gracebroadcast.com](http://www.gracebroadcast.com)

**100% Royalty-Free Commercial Production Music**

Buy any single CD for \$49.  
Get any 4 for \$149.  
Get 8 for \$249.  
Get all 16 for \$399.

Complete track listings and demos are online at [www.radio-mall.com](http://www.radio-mall.com) or call 1-800-759-4561

## ATTENTION PROVIDERS!

Promote your services to **Radio World's** readers. Reach Radio Station and Recording Studio owners/managers and engineers with your message.

For information on affordable advertising call **Simone** at 1-703-998-7600, ext. 154.

# It Tastes as Great as It Sounds

"As the spaceship touched down on Mars, I began to wonder: Do they have classic rock here? I tuned my dial to 96.5 FM and found it immediately. Cool!"

In just 10 seconds, we took a listener millions of miles into space, just so they could recall our dial position. Fantasy copy like this has a better likelihood of "printing." It gives us a fighting chance that the listener might actually write down that frequency in a diary.

This trip to Mars took 30 seconds to write and five minutes to produce, complete with effects. It cost almost nothing to make.

Over the last 10 years or so, the overall quality of recorded pieces, either promotional or those done for "stationarity," has improved dramatically. Even the smallest markets now often sound like the big boys. This has occurred because of the evolution of editing software and increased processing power of computers, not to mention the scores of talented people who have entered the business.

Creative services directors create incredibly complex pieces in just minutes instead of the hours it used to take, then often share work-parts of these pieces with others via e-mail.

This is all great, right? There's just one issue: This production, though full-sounding, often is dull. Why? Because so much of it is written poorly.

## Facts+emotion

Well-produced, poorly written production reminds me of food that looks delicious and tastes like cardboard. How can you tell if your station has fallen into this trap?

Play your promos for someone who isn't in radio. After they hear each piece a couple of times, ask them to write down what they remember about it. Below their recollection, ask them to describe how they feel about the piece emotionally.

If you don't receive solid answers in both areas, you've missed the mark.

The goal is to deliver the facts wrapped around some sort of emotion — happiness, sadness, greed, love, hate, even lust. If your test subjects say your spots sounded great but they can't recall much else, you're likely churning out material that few will remember. This is a big problem. We are measured by what listeners remember to write in diaries for Arbitron.

Attempt a new way to write. Try writing regularly with one or two other people. You may find this awkward at first, but the benefits become obvious after a few sessions. The others will pull you in directions you don't usually go. That in itself can be helpful.

One trick I like to use when I'm stuck is to pick something completely unrelated to the topic at hand and see where that may lead.

For example, let's say you're writing a promotional spot asking listeners to donate gloves to a homeless shelter. Pick something unrelated — like snow tires — and somehow make it fit in the copy.

"It was so cold outside they were burning old tires to stay warm ... rubbing their hands together ... none of them had gloves ..." Maybe not a keeper, but it got me started down a path I hadn't considered.

Scores of useful techniques exist to improve your writing skills or those of

your production team. The local library probably has many books about this subject. Not all of the suggested techniques work for writing radio copy, but many do.

## People power

If you'd like to cut right to the chase, several people in broadcasting have tackled the subject effectively. Roy Williams has made the rounds in our industry for a number of years; if you've never encountered his work, seek him out in print or in person. His material is inspirational.

I also recommend reading copy written for mail-order catalogues like Sharper Image or Sierra Trading Post. The copy for those sales mags is sharp and short. It

attempts to move a person to action — as copy for radio should.

I recently heard two creative service directors talking about production. They were nearly 20 years apart in age. The younger was asking the older how he had created flange sounds on voices prior to digital editing. Told how — and worse yet, how long it used to take — the younger said, "I don't know if I could've done this without a computer. How'd ya deal?"

The older guy scratched his chin and said, "Oh. I had a typewriter."

I'm not sure if the younger guy got it. Mark Lapidus is president of Lapidus Media; reach him at mark-lapidus@yahoo.com.

## Promo Power



by Mark Lapidus

Looking for a Digital Audio Logger? Why not try the Industry

# STANDARD

**iMediaLogger**

**Radio's #1 Selling Digital Logger!**

Industry Standards - OMT has been setting them for over 35 years. Our iMediaLogger Digital Logger, and our iMediaTouch Broadcast Automation, are proof of this.

Introduced in 2000, iMediaLogger set the bar for all other Digital Loggers. Used in all of the top ten US markets with more features than any other competitor, iMediaLogger has easily become the most popular Digital Logger in Radio.

With non-proprietary hardware, special Corporate Rates and the compatibility with the new ASI Tuner Card, there's no reason to look to any other software.

**ONE 94.5 KSOUL 97.9 THE BEAT**

"When we installed the iMediaLogger, we showed our PD what it could do for him. He responded by saying 'This is my newest favorite toy'. The ability to instantly listen to our stations or the competing stations 24 hours a day and preparing airchecks has greatly helped our Production and Sales Departments"

**Don Stevenson - Chief Engineer**  
Radio One Dallas- Dallas, TX

**iMediaLogger features:**

- This multi purpose tool can simultaneously perform 24/7 logging, Mic Skimming, Competition Monitoring and Back Ground Recording.
- On one record input, create four recordings (24/7 log, Mic Skim, Best of show and an internet stream). For example The 8 Channel iMediaLogger = 8X4 for a total of 32 recordings!
- Station personnel can then access any of their recordings remotely via LAN/WAN with its built-in Web browser Interface.

The Original. The Standard. The Innovator. **omt technologies**

To find out more, call us Toll Free 888 665 0501 ext.208 or visit [www.imediatouch.com](http://www.imediatouch.com)

**Company: AudioScience Inc.**  
**Product: ASI8702/03 Eight-Channel Tuner Adapter**



It's a sound card. It's a radio tuner. It's both!

The ASI8702 is a PCI sound card that contains eight AM/FM tuners. Each tuner may be set to an independent AM or FM radio station. The audio from each tuner is presented to the computer host as a mono or stereo record stream that can be accessed as a Windows or Linux sound device. This allows applications to record eight simultaneous stations off the air.



Uses include station logging, ad verification and content identification. It will be popular with system integrators, who now have to cobble together discrete programmable tuners and feed audio to a multichannel sound card for recording to PC. The ASI8703 is similar but it contains eight FM/TV audio tuners, allowing off-air or cable TV audio to be recorded. (TV? That's just radio with pictures, right?) Retail: \$2,995. Volume pricing is available. Shown, T.K. Pang, Tom Eckert and Eliot Blennerhassett get tuned in.  
 Info: (302) 324-5333 or www.audioscience.com.

**Company: Broadcast Tools**  
**Product: DMS-III Digital Monitor & Switcher**



Here's a company that knows how to make a problem-solver.

The DMS-III accepts and automatically or manually switches two AES signal sources when a digital error or analog silence are detected.



An auto control function switches to a backup source on failure of the main one. Switch functions can be triggered by loss of clock, digital error flags, front-panel transfer switch, external switch contact and/or the internal analog stereo silence sensor.

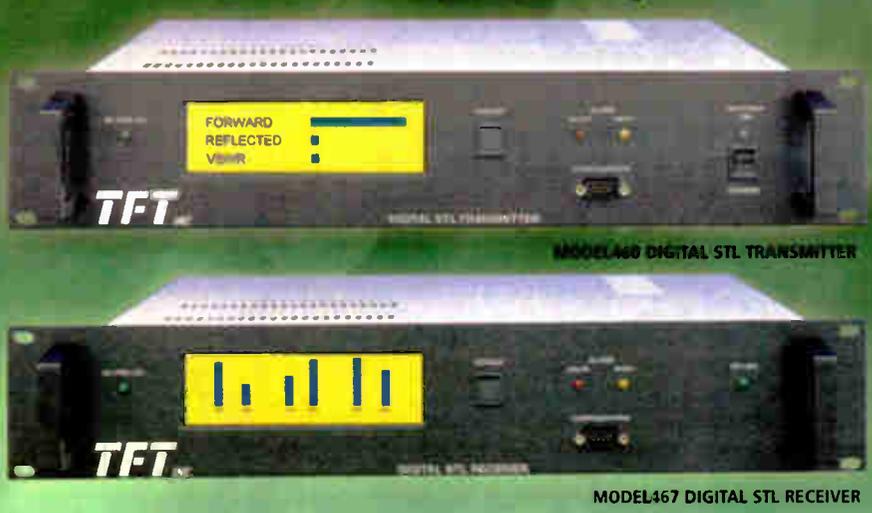
Lots of goodies built in including front-panel error status and sample-rate LED indicators; headphone jack and level control; balanced stereo monitor output; remote control; removable screw terminals; plug-and-play installation; dip-switch selection of time delay from 2 seconds to 85 minutes and restore timing delay from off to 10.2 minutes; defeatable sonalert aural alarm; SPDT status relays; SPDT one-second pulse relay.

Set it on a desktop, mount it on a wall or put three units in the rackable mounting shelf. Retail: \$499.

Don Winget and Connie Miller are pictured.

Info: (360) 854-9559 in Washington state, or www.broadcasttools.com.

## The Broadcast Industry's **FIRST** 6-channel UNcompressed Digital STL



**Advanced Technology, Only From TFT**

- 6 UNcompressed Program Channels, maximum
- PC Configurable from Front Panel for Frequency, I/O, Alarms, LCD
- Supports 48, 44.1, as well as 32 ks/s Sample Rates
- 256 QAM, 64 QAM, 16 QAM Modulation
- AES/EBU or Analog I/O - Built-In Sample Rate Converters
- Major/Minor Alarms on both Transmitter and Receiver
- 3.125 kHz Step Size

**TFT INC**

Phone: (+1)408-943-9323  
 FAX: (+1)408-432-9218  
 www.TFTInc.com e-mail: info@tftinc.com  
 1953 Concourse Drive. San Jose, CA 95131

## EXPECT MORE FROM YOUR AM TRANSMITTER



*Made in USA*

**Armstrong Transmitter X-1000B**  
 1KW HD Radio ready AM Transmitter for under \$10K

Built with dual hot-swappable 600 Watt RF modules capable of 150% modulation, X-1000B can bring that major market sound to your radio station. Engineered with the latest technological innovations, X-1000B offers high reliability, built-in redundancy and it is HD Radio ready.

Best of all, our customers tell us that the money they save running the X-1000B pays for itself with savings in electricity and maintenance costs over an older transmitter ...and as a bonus they get exceptional reliability and that major market sound for free.

But, don't take our word for it. Talk to our customers already on-the-air with the X-1000B. Call or email for a users list and decide for yourself why owning this transmitter is a no-brainer.

**ARMSTRONG**  
 TRANSMITTER CORPORATION

Tel 315-673-1269 / sales@armstrongtx.com / www.armstrongtx.com

HD Radio is a registered trade mark of iBiquity Digital Corporation.



The Interleaved Analog-Digital Antenna  
from Shively Labs

*The First and Still the Best!*

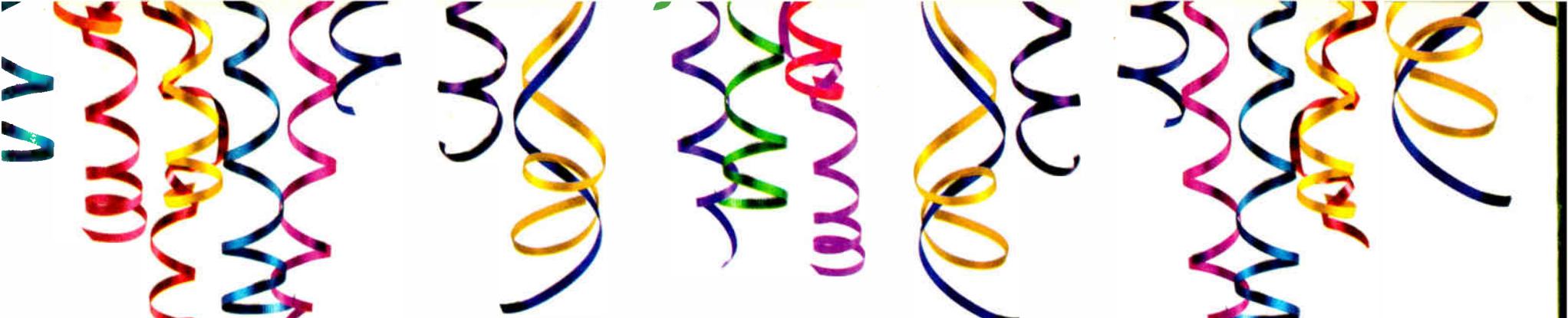
- Guarantees Identical Analog and Digital Coverage
- Fits in Same Aperture as Existing Analog Antenna
- Meets All FCC Requirements for Dual Antennas
- Simplifies Proofs of Performance for Directional Antennas
- Superior Analog/Digital Isolation

At **Shively Labs**,  
we understand ...

*It Pays to Be Heard!*

A Division of Howell Laboratories, Inc.  
P. O. Box 389, Bridgton, Maine 04009 USA  
(207) 647-3327      FAX (207) 647-8273  
1-888-SHIVELY      www.shively.com  
sale@shively.com

An Employee-Owned Company  
Certified to ISO-9001



# It's Zephyr's 10<sup>th</sup> birthday (But you get the present).



Get two award-winning codecs – Zephyr Xstream & Zephyr Xport POTS – for just \$4,995 US MSRP. Add ISDN capability (with G.722 and low delay MPEG AAC-LD coding) to your Xport for just \$399 more, or...



...Upgrade to the Ultimate Remote Bundle: a rack-mount Zephyr Xstream for the studio and a portable Zephyr Xstream MXP with 4-channel DSP mixer and onboard audio processing by Omnia, for only \$7,294 US MSRP.

When we first married MP3 with ISDN in 1993, we had no idea that their offspring would grow up to be the most-loved audio codec ever. But it has, and its popularity keeps growing – there are now **more than 10,000 Zephyr codecs** in radio stations and production studios around the globe.

A birthday this significant deserves a special present, so here it is: the Zephyr 10th Birthday Bundle, a complete codec package at a **once-in-a-decade price**.

You'll get the best-selling Zephyr Xstream for your studio, and the satisfaction of knowing you can make CD-quality ISDN connections to virtually anywhere using industry-standard MPEG Layer 3 or MPEG AAC coding. And for your remote kit, the award-winning Zephyr Xport with built-in two channel mixer — perfect for sponsored remotes, sporting events, interviews and live appearances. Just plug in to any POTS phone line for an *aacPlus*<sup>™</sup> link to your Zephyr Xstream; you'll get stunning audio and rock-solid connections.

Best of all, you'll receive your Zephyr 10th Birthday Bundle for the special price of just \$4,995 US MSRP – **over \$1,800 in savings**. (There are more special Zephyr bundles to fit specific needs; just ask your Telos dealer.) But don't delay — this special offer is only good through ~~February, 2004.~~

**JUNE 30TH, 2004!**



*Telos*  
AUDIO | NETWORKS



telos-systems.com

Telos, the Telos logo, Zephyr, Zephyr Xstream, Zephyr Xport are all registered trademarks of TLS Corporation, © 2003, TLS Corporation. All rights reserved. aacPlus (TM) Coding Technologies.

World Radio History



# Buyer's Guide

Radio World

Audio Processing

June 2, 2004

USER REPORT

## WOR Is Loud, Proud With Omnia 5-EX

by Thomas R. Ray III, CPBE  
Corporate Director  
of Engineering  
Buckley Broadcasting/WOR(AM)

**NEW YORK** WOR(AM), on the air since 1922, holds many distinctions among pioneering stations. We are the first AM HD Radio station in New York City. And as the self-proclaimed loudest analog AM signal on the dial in the state, we take our audio processing seriously.



The author says no one is going to take his new processor — no one.

With such a reputation to uphold, Frank Foti of **Omnia Audio** brought over each of the company's AM processors for us to sample, starting with the AM-3.

We put the AM-3 and the AM-4.5 on the air at WOR, and while the processors were clean, we couldn't seem to get the desired punch and density. The AM-4.5 was better than the AM-3, but it had a strange curve to its attack times that would cause two of our talent to distort when they took short pauses.

After hearing what was said about the AM-3 and AM-4.5, Frank called and reported that his new AM processor, the 5-EX, would be right for us, particularly because it had two outputs, one for the analog AM, and one for the HD signal that WOR has been running since October of 2002.

I arranged for Frank and Telos Sales Manager Kirk Harnack to meet with me at the WOR transmitter facility early one fine afternoon.

### Go digital, or stay analog

The Omnia 5-EX allows the user to adjust almost anything and has many neat features, such as the front-panel display that shows every parameter available in the unit. Additionally, it has an Ethernet jack on the back, so you can telnet into the unit — even from the Internet, if your router is set up properly. It outputs an

AES/EBU signal for the analog and digital sides of your HD Radio exciter, while allowing you to maintain an analog audio output for the analog AM just in case. The analog output can be set to output HD audio or AM audio, and its level is set independently from the AES output.

Further examination of the back of the unit shows a DB-25 connector that can be used for control of the 5-EX through Omnia Remote software, or for troubleshooting. A DB-9 connector allows

the Omnia 5-EX is stereo, and can easily feed a C-Quam AM Stereo exciter.

Once the analog output was set, we set the upper rolloff frequency to 6 kHz to meet the IBOC specifications. Frank then made a few magic tweaks on the processor, and it was time to turn the HD carriers back on.

On the analog processing side of the 5-EX, Frank first took the signal through a wide-band AGC and then a two-band AGC for further processing. At this point, the signal splits. One side of the splitter feeds the rest of the 5-EX's AM processing chain, which includes five-band processing and clippers. The other split goes into a special limiting section set up specifically for the HD codecs.

You can do what you wish to the AM signal, as it has its own processing section that manages to keep the HD audio as clean as possible — important when feeding a data-reduced codec. Violent clipping or aliasing through multi-band filters will produce artifacts that are tolerable through analog transmission paths.

Through an HD Radio codec, however, these artifacts multiply quickly and take on a life of their own. The 5-EX uses the two-band AGC as its spectral control and uses minimal limiting. It enabled us to make the HD-to-analog blend almost the same volume level, yet keep the HD audio clean.

The range of control you have over the audio with unit is phenomenal. There are

you to issue commands to the 5-EX from relays on your site controller. Grounding one of eight input pins enables eight scripts to run in changing configuration of your Omnia.

Because we feed the HD Radio exciter AES signals for analog and digital inputs, we set the 5-EX to its aggressive talk setting, and set the AM and HD AES outputs to the setting of the processors already on the air. After a quick transfer of XLR connectors, the Omnia was in action.

Our first order of business was to check the analog modulation with an oscilloscope. With the HD carriers off, we made sure the analog modulation was about -97 percent, with the positive peaks at +122 percent. It became evident while tweaking the analog output that Frank Foti listened to what my Chief Engineer Kerry Richards and I had to say about his previous Omnia AM processors. On the AM-3 and AM-4.5, you needed to adjust both the left and the right outputs to get the proper modulation levels for the analog signal. With the 5-EX, the left and right output gain controls are ganged together, allowing the balance to be adjusted as desired. What a pleasant surprise.

In my enthusiasm for the HD Radio aspects of this processor, I almost forgot to mention that the analog AM output of

### The World Of Processing

"Processing" is a term that can mean many things in radio.

For this issue of *Buyer's Guide*, Radio World presents information about on-air radio broadcast processors, as well as specialty devices such as profanity delays (a timely topic) and audio devices used in production studios.

As always, *User Reports* are written by radio professionals whom we ask to describe why they purchased a particular product; the writers are not paid for these articles. The stories are distinct from *Product Evaluation* articles, which appear elsewhere in Radio World and are written by paid writers to whom a product is shipped for review. *Tech Updates* are brief reports about new products.

All are intended to help you become a more informed buyer.

too many controls to list in this article, but suffice it to say, Foti and his team have thought of just about everything.

### Road trip

The real test was in the field, so we piled in the HD Radio-equipped Ford Explorer and went for a ride directly up Route 17 in New Jersey, WOR's major null.

Additionally, we parked about 2,000 feet from our direct competition's tower.

See OMNIA, page 41 ►

**www.mouser.com**

300,000+ Electronic Components  
Over 1,000,000 Cross References

SEMICONDUCTORS | PASSIVES | INTERCONNECTS | POWER | ELECTROMECHANICAL | TEST, TOOLS & SUPPLIES



New Products,  
New Suppliers,  
New Technologies,  
New Catalog Every 90 Days!

**MOUSER**   
ELECTRONICS

(800) 346-6873 [www.mouser.com](http://www.mouser.com)

Mouser® and Mouser Electronics® are trademarks of Mouser Electronics, Inc.

## USER REPORT

# KUSC(FM) Likes Diversity of FMX480

by **Pablo Garcia**  
**Director of Engineering**  
**and Operations**  
**KUSC(FM)**

**LOS ANGELES** This year, KUSC(FM) upgraded its four stations to HD Radio, bringing in HD Radio technology to the public radio audience in Southern California.

In our efforts to provide the best complete service, we also decided to expand our RDS capabilities. To achieve this goal efficiently, we needed to be able to access the RDS encoder at

the transmitter site from any point at anytime via the Internet, in order to make text and other changes a simple

The FMX480 uses DSP to create a nice stereo signal, and offers audio that is free of harmonics and filtering prob-



The FMX480 features an embedded Web server supported by network protocols, like TCP/IP.

task. The FMX480 digiplexer from Audemat-Aztec met each of our requirements.

lems. We chose the FMX480 multiplexer out of the three encoding products offered by Audemat-Aztec

because of its diversity. The single-RU unit offers the FMB80 RDS encoder, sound processor, digital stereo generator, DARC encoder and digital composite clipper.

We are using the RDS encoder section out of the FMX480, but as every broadcast engineer knows, you can

never have enough redundancy. So we have a spare stereo generator, audio processor and digital composite clipper. Additionally, we have the ability to encode DARC in case we need to do so in the future.

## TECH UPDATE

## Aphex Works Within Analog To Avoid Aliasing

The Aphex Model 2020 MkIII is a broadcast audio processor that promises average level control and an absolute peak ceiling while maintaining distortion-free sound.

It features five functions for FM, television or IBOC broadcast applications: leveling, multiband compression, limiting, pre-emphasis limiting with low-pass filtering and a PPDM stereo generator.

The 2020 MkIII is an incarnation of the original Model 2020. Because it processes within the analog domain, Aphex says, users avoid aliasing problems generated by some digital processors. Facilities that work in the digital domain can interface with



The multi-functional 2020 MkIII features a wave-dependent compressor and sticky leveler.

the 2020 MkIII by way of the optional AES/EBU digital interface, which uses drift stabilization.

Preset settings are customizable by each facility for its own sound. The unit is controllable by the front-panel controls or remotely by way of RS-232 and a modem. Features include frequency discriminate leveler; a dynamic verification gate; a sticky leveler; adjustable gain correction; wave dependent compressor and post-crossover multiband compression techniques.

Additional highlights include band-by-band release times; split-band clipping; automatic limit threshold; adjustable density and bass processing; and parallel path digital modulation.

For more information, including pricing, contact Aphex Systems in California at (818) 767-2929 or visit [www.aphex.com](http://www.aphex.com).

**T**he one-box aspect of the FMX480 is naturally better than separate encoders, and enables synchronization of subcarriers.

Not only does the FMX480 offer full remote access via its 10BaseT Ethernet port, it has an embedded Web server supported by most often used network protocols, such as TCP/IP, Telnet and FTP. This makes the transfer of music information data from our automation system over the Internet easy and efficient.

The one-box aspect of the FMX480 is naturally better than separate encoders, and enables synchronization of subcarriers. This lets you adjust their levels interactively for easy control of overall deviation through a graphical representation of the modulation level. It gives you a cleaner signal than separate units would because subcarriers are combined in a single digital operation.

Unlike with the use of separate units, noise build-up is a non-issue. There are no analog band-pass filters in the encoder to degrade audio quality, resulting in better performance and freedom from drift.

A possible configuration for using the FMX480 is when radio stations install a sound processor in the studio. The FMX480 would be installed on the transmitter site, where it would "clean" the audio signals that have been altered by the transport. It would then "clip" the composite signal using a predictive algorithm, which processes the signal at its source.

Not only has the FMX480 given us the results we were looking for, but the technical and customer support provided by Audemat-Aztec North America has been first class. The company is offering a 30-day trial of the FMX480.

For more information, including pricing, contact Audemat-Aztec in Miami at (305) 692-7555 or visit [www.audemat-aztec.com](http://www.audemat-aztec.com).



## DSPX Digital Audio Processor

for less than  
**\$3000**

- 18 x 24-bit DSP's providing 1 GIGA-MIPS of power
- Comprehensive BLUE audio metering and screen
- Digital and analog IO
- Wide and multi-band AGC's with intelligent gating
- Multi-band programme dependent limiting
- Look ahead limiter and distortion cancelled clipping
- DSP stereo encoder with composite clipping control
- Back-panel and rackroom (front panel) serial control
- LAN / Net webserver for remote control
- Full range of user presets with live A/B switching
- Software upgradeable

Version 1.0  
 now available



Available from top broadcast dealers or factory direct from  
[www.broadcastwarehouse.com](http://www.broadcastwarehouse.com)

See the DSPX at  
**Broadcast Asia 2004**

USER REPORT

# Eventide BD-500 Turns It Up to 40

by Jeff Smith CBT, CBNT  
 Director of Broadcast Systems  
 Nassau Broadcasting Partners LP

**PRINCETON, N.J.** Like most broadcasters, Nassau Broadcasting Partners has become concerned with the recent crackdowns by the FCC on indecency.

When our programming department requested profanity delays for all of our FM and AM stations, there was no doubt we were going to use an Eventide product. I had been using the BD-500 8-second delay with much success for years on stations that take live phone calls, and was thrilled to learn that the new BD-500 can delay up to 40 seconds. It has always been a reliable unit, performing like a workhorse without any failures.

Another reason I was quick to stick with the BD-500 was its audio performance. The unit is virtually seamless to the listener when building its delay or ramping to zero, an important feature for us when evaluating delays for our company. The algorithm used by Eventide to generate the delay is the best in the industry, and the BD-500 passes clean audio, with a frequency response better than 20 Hz to 20 kHz and a signal-to-noise ratio of better than 90 dB.

**The unit is virtually seamless to the listener when building its delay or ramping to zero.**

When the IRU units arrive, they are plug-and-play. But you can still program features to meet your needs, such as audio levels, delay time or how much time to cut, from the front panel. The configuration menu offers the choice to set power-up mode, delay length, safe time, rebuild time, dump amount and input and output levels. Front-panel configurations can be password-protected so they are inaccessible to others.

The flexible configuration allows me to adjust the audio level in and out of the unit, making the BD-500 work with any level coming from the console and out to the air chain. I like the options concerning delay times, such as the ability to configure the unit's safe time, the amount of delay the unit must have before it will light the dump button and become operational. This can be set from 1 second to the max of 20 or 40 seconds, depending on your unit. You can set the rebuild and ramp to zero time from 0 seconds to 720 seconds.

Another nice feature is the ability to set the dump amount from 1 to 20 seconds, allowing multiple levels of delay in one unit. If you have a 20-second delay and set the dump amount to 5 seconds, you are still left with 15 seconds of delay when you hit the dump button, keeping you protected without the expense of multiple delays in line.

All in all, I am impressed with the unit. However, Eventide has been having



trouble recently keeping up with demand for the BD-500. I have been waiting for more than three weeks for the delivery of recently ordered units.

Also, the levels in and out can be a little tricky to set up. Once you have them set, the unit is seamless when switched from bypass to active. But until you get them just right, you can notice a level difference when the unit is put in bypass.

Eventide BD-500 delays have been in use in our stations for several years and continue to perform like they were new. Making the decision to put them in all of our stations was easy, as they protect our stations and airwaves from

unwanted material.

For more information, including pricing, contact Eventide in New Jersey at (201) 641-1200 or visit [www.eventide.com](http://www.eventide.com).



The author appreciates the BD-500's extended delay and flexible dump amount when taking live phone calls.

## TS9000 FM Broadcast Analyser

microGen  
 electronics

New!

- The TS9000 is a high performance FM receiver and Modulation Analyser providing accurate broadcast measurement
- The USB port allows for on-site and mobile monitoring. The unit samples the Multiplex signal at 240kHz at 12bits precision, with all measurements and calculations performed by Windows software
- Modulation Power is calculated with 32bit floating-point precision. The band covered is 87.5 to 108MHz in 10kHz steps

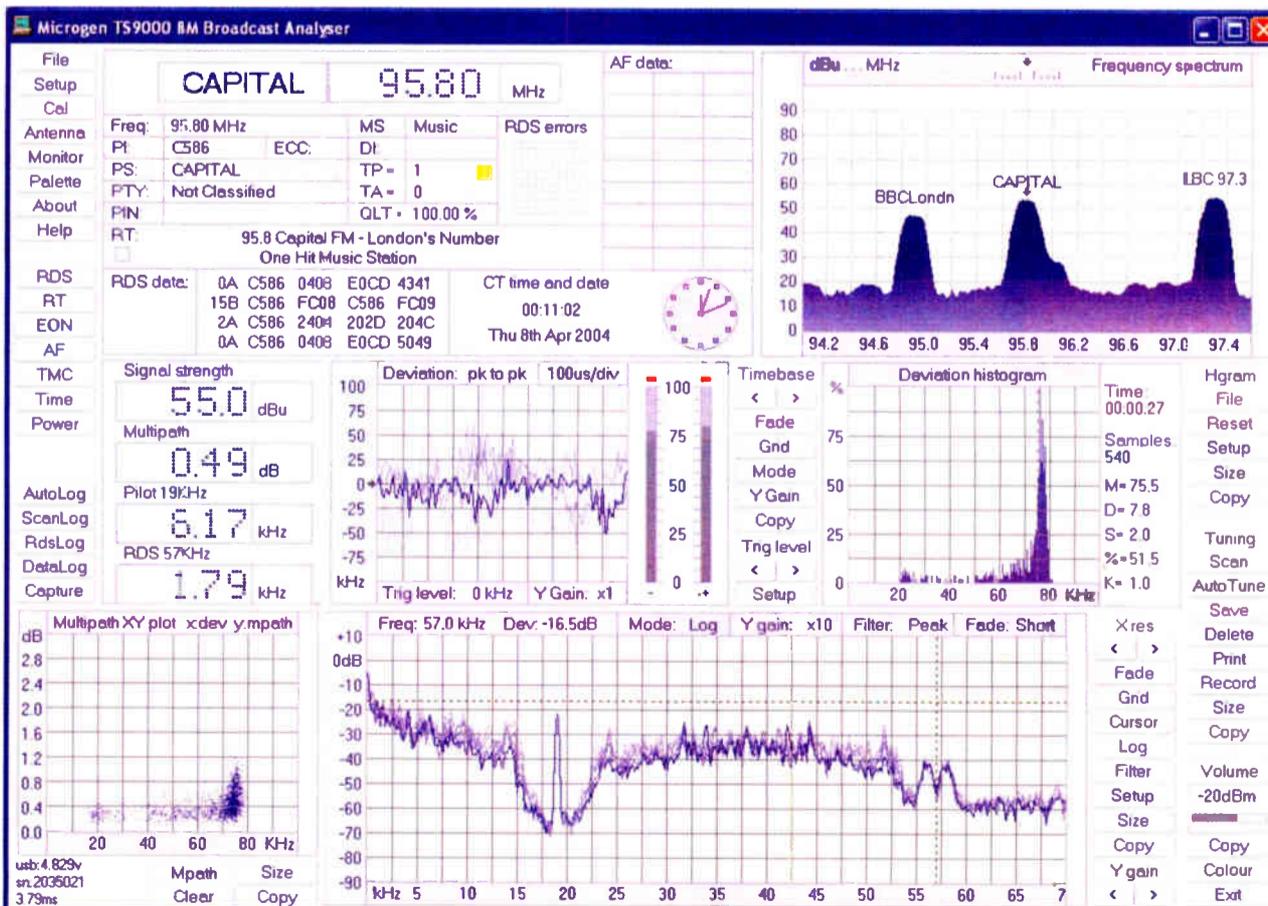
NAB 2004 Radio Magazine 'Pick Hit' Award Winner



NAB 2004 Radio World 'Cool Stuff Award' Winner

MSRP \$1800

- Drag or Click Tuning
- RDS Decoding
- MPX power Measurements
- Modulation Measurements
- RSSI Signal Strengths
- Multi-Path Measurements
- Pilot & SCA Measurements
- FFT Analysis
- Balanced and Phone Outs
- USB Powered
- Much Much More



Information: [www.microgenelectronics.com](http://www.microgenelectronics.com)

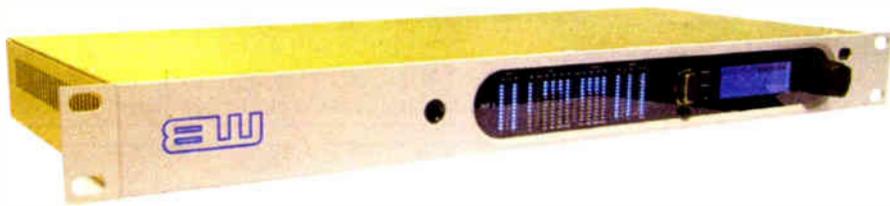
Sales: [www.broadcastwarehouse.com](http://www.broadcastwarehouse.com)

## TECH UPDATES

## BW DSPX Offers Dual Processing Paths

The DSPX multi-band digital audio signal processor from United Kingdom-based **Broadcast Warehouse** uses DSP technology. It is driven by an eight-bit microcontroller that handles several analog and digital circuits. These include 24-bit A/D and D/A converters, analog level control circuitry, 18x24-bit DSPs, an Ethernet port, a trigger port and 2 x RS232 ports. Additional features include 200 LEDs for metering, an LCD screen, two sample rate converters, a headphone jack and memory devices to hold the software and firmware.

After input selection, the 24-bit digital audio signal is passed through a wideband AGC processing block to normalize input levels. The output of the AGC feeds the EQ and audio-shaping sections before being split into four bands by linear phase time-aligned filters. The four bands are processed by an additional four AGCs before being fed to dynamic audio limiters on each band.



The DSPX uses DSP technology and features several AGCs.

Dual processing paths enable simultaneous processing for FM to digital radio. Limiting and distortion-canceling clipping ensure the signal is kept to a maximum while maintaining clear sound.

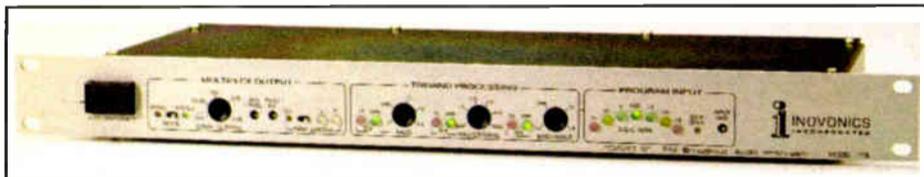
The DSPX's front-panel control system features the LED metering display, while control of processing parameters is available from the front panel and by remote (computer) control.

For more information, including pricing, contact Broadcasters General Store in Florida at (352) 622-7700 or visit [www.bgs.cc](http://www.bgs.cc).

## Inovonics Adds to FM Processor Line

Broadcast equipment manufacturer **Inovonics** introduced the first in its series of David (as in David and Goliath) FM processor/generators in 1992.

It recently updated the line with the third-generation David III. The unit has three-band feedforward pulse width modulation (PWM) processing, as well as polar independent peak processing, which enables full carrier deviation by program audio regardless of signal asymmetry. The PIPP limiter may be defeated with a front-panel switch. Digital synthesis of the multiplex baseband signal yields stereo separation of 60-70dB and adjustment-free operation.



In terms of noise, the company says David III offers better than 70dB below 100 percent modulation in decoded L/R audio. Individual digital noise components above 54 kHz are -70 dB or better. Additionally, the unit boasts a distortion of less than 0.5 percent in baseband and subcarrier at 95 percent modulation with PIPP limited defeated, and less than 1.5 percent at any level of modulation with PIPP limiter engaged.

Active-balanced, bridging XLR inputs accept nominal program line levels between -15dBu and +10dBu. Nonlinear crosstalk exceeds -50dB, and linear crosstalk (through processing and filters) exceeds -40dB. The unit's seven-pole, phase-corrected, active-elliptic low-pass filtering includes the company's overshoot compensation. Clipping is performed prior to pilot injection, and baseband clipping may be adjusted between 0 dB and 3 dB.

The 75-ohm unbalanced BNC output is variable between 1V p-p and 10V p-p with reference to 100 percent carrier modulation. Power requirements are 105-130 VAC or 210-255 VAC, 50/60 Hz; and 15 W.

For more information, including pricing, contact Inovonics in California at (831) 458-0552 or visit [www.inovon.com](http://www.inovon.com).

### Product Showcase



#### Model AFS-3 Audio Fallsafe

- silence sensor—balanced or unbalanced audio
- provides contact closure on loss of audio
- adjustable from 30 seconds to 5 minutes
- dry relay contacts or logic level voltage
- front panel alarm indicator and audible alert
- optional audio detect mode

**Sine Systems** inc.

615.228.3500

more information: [www.sinesystems.com](http://www.sinesystems.com)

## Waves Debuts Sampling Reverb

**Waves Inc.** offers digital audio processing systems for professional audio applications, and recently began shipping its IR-1 convolution-based (sampling) software reverb, which enables control of primary reverberation parameters.

The system comes with a library of over 60 sampled impulse responses from concert halls, hardware-based reverb devices, rooms and other spaces, such as Rome's Santa Cecilia auditorium to and Nashville's Bluebird Café. All sample parameters can be controlled from the front panel.

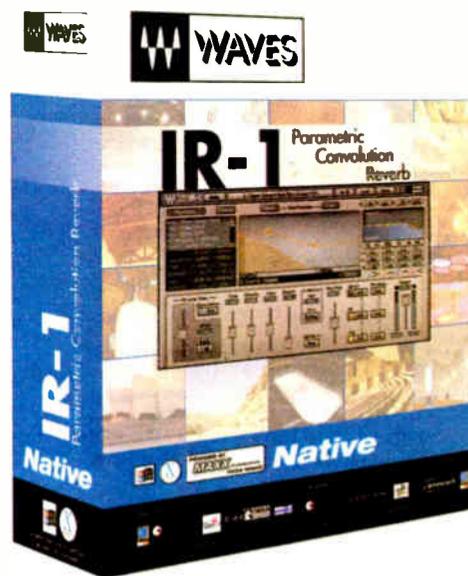
Conventional reverb devices have been popular because of their control and easily varied parameters to set room size, RT60 and filtering.

Convolution-based or "sampling" reverbs offer the sound of real spaces, but in the past have been unable to offer the same degree of control as conventional digital reverberation units. IR-1's parameters are variable and the control is from 0.25 to four times the natural parameter value.

The user can vary the RT60 reverberation time of an actual sampled space and change the size of the space without losing its character. Graphical breakpoint envelopes enable the decay shape to be modified to suit the application. The system also can change the reverb density, analyze the frequency response and derive room nodes, use de-correlation to optimize the stereophonic character of the reverb and add gain and pre-delay to each portion of the reverb curve. Damping is controlled by IR-1's filtering, and a Waves 4-band parametric EQ controls the color of the reverberation.

The company offers a 14-day free demo of the IR-1, which is supported on Mac and PC programs via RTAS, HTDM (Mac), AudioSuite, VST, DirectX (Win), MAS (Mac) and Audio Units (Mac).

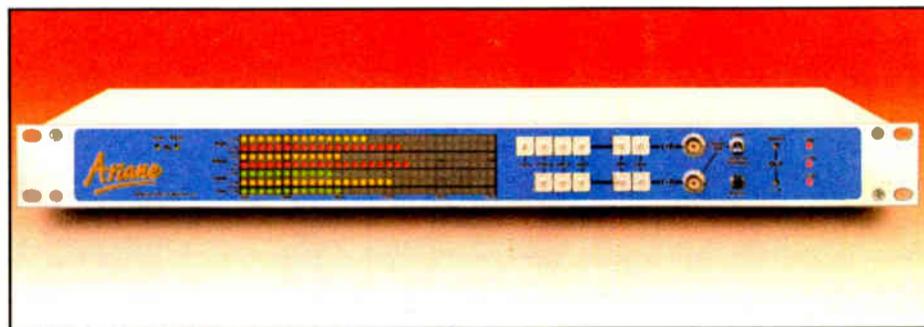
For more information, including pricing, contact Waves in Tennessee at (865) 546-6115 or visit [www.waves.com](http://www.waves.com)



IR-1's parameters are variable, with control from 0.25 to four times the natural parameter value.

## TransLanTech's Ariane Promises Consistent Output

At NAB2004 **TransLanTech Sound** demonstrated its Ariane stereo audio leveler, an RMS AGC that operates in seven frequency bands. The processor adjusts levels, spectral balance and stereo content to maintain a consistent output for recording, live dialog, STL protection and, the company says, putting the audio in the sweet spot for final processing going to the transmitter.



The Ariane has an adjustable dynamic range window that enables it to discern between processed and unprocessed audio.

Ariane operates in the sum and difference mode, with incoming audio passing through a sum and difference matrix to produce two new signals: the combination of and the difference between the left and right. These two signals are independently multiband processed to control the audio amplitude and stereo content.

The adjustable dynamic range window, called "IDR" for Instantaneous Dynamic Range, enables the Ariane to discern between audio that has been processed and needs to be processed, leaving already processed audio alone.

When Ariane is placed in front of existing processors, the supplier says, the combination produces advantages to FM broadcasters, such as a more consistent stereo stage through a maximized FM transmission medium with sum-referenced control on the difference signal; adjustable multiband crossover points for equal energy in all bands; removal of low-frequency components from the difference signal; RMS detection for control that mimics human hearing audio power sensitivities; and a single pole (6 dB per octave) phase-coherent subtractive filter for natural sound.

For more information, including pricing, contact TransLanTech Sound in New York City at (212) 222-0330 or visit [www.translantech.com](http://www.translantech.com).

TECH UPDATES

## Crown Features Omnia Processor Option

Crown Broadcast has partnered with Omnia, a Telos company, to offer an Omnia processor option for Crown's line of transmitters.

The Crown/Omnia DP3, a winner of Radio World's "Cool Stuff" Award at NAB2003, has provisions through a 10/100 Base-T Ethernet port on the rear panel to choose among 15 preset format settings, five of which can be user-defined. Software for the remote entails using a Web browser for the operating system, enabling flexibility among computer platforms. Standard I/O configurations are provided through this port as well.

Crown offers a front panel option called the FMX, which allows the user to change some of the parameters of the DP3 (under password protection) via the front display, including changing format presets, input/output levels, processing gain levels and other parameters.

Stereo signal-to-noise readings typically are better than -80 dB, and stereo separation typically is better than -65 dB. Crosstalk readings from main-to-sub and sub-to-main channels typically are better than -75 dB. Amplitude changes are minimized from 50 to 15K at +/- 0.2 dB, keeping the audio response as true to the settings as desirable.

The DP3 has automatic detection for AES/EBU input signals with an automatic rate converter that accepts 32 kHz, 44.1 kHz, or 48 kHz rates.

For more information, including pricing, contact Crown Broadcast in Indiana at (866) 262-8972 or visit [www.crownbroadcast.com](http://www.crownbroadcast.com).

## XM Uses Neural SEE for 5.1 Broadcast

The Spatial Environment Engine from Neural Audio is a decoder processor system that the company says enables a surround-sound experience in automotive and home audio from a digital two-channel broadcast source.

Using watermark embedment from the Neural broadcast processor, SEE derives spatial cues to intelligently render the spatial image, whether 5.1 original, 5.1 produced or original stereo.

XM Satellite Radio has been using Neural Audio broadcast processors in its Washington broadcast center, and will use SEE to provide the first public showcase of 5.1 surround sound from this broadcast source. Tony Masiello, senior vice president of operations at XM Satellite Radio, said that prior to its launch, XM implemented a customized audio processing solution using Neural Audio's broadcast processor that provides sound remarkably close to compact disc.

SEE completes the loop at the receiving end. Neural said it lets listeners enjoy the potential of surround content comparable to the sound quality of multi-channel audio.

Used in an automotive audio system, SEE expands the listening "sweet spot" to include the entire passenger compartment. Neural's SEE is backward-compatible and can be integrated with existing decoders from providers such as Dolby, SRS, Lexicon and DTS.

Neural SEE is available as licensable software, or as a stand-alone hardware module that can be integrated with existing car and home audio systems. The product is marketed to OEM partners with price dependent on volume.

For more information, including pricing, contact Neural Audio in Seattle at (206) 417-4700 or visit [www.neuralaudio.com](http://www.neuralaudio.com).



Because the DP3 offers auto detection of AES/EBU signals, the user does not need to configure it; units in the field can be retrofitted.

**Recommended Daily Allowances**

Seattle WA: 800.735.7051  
 Northing CA: 800.737.7321  
 Santa Barbara CA: 800.346.6484  
 Killeen City MO: 800.467.7373  
 Richmond VA: 888.968.1990  
 Edinburg PA: 814.472.2000  
 Mechanicsville PA: 888.412.7373  
 Southampton PA: 888.260.9258  
 New Ipswich NH: 800.485.6584  
 Vero Beach FL: 800.478.0243  
 Amarillo TX: 800.537.1801  
 Ft. Worth TX: 888.839.7373

**RF Specialties Group**

RF is good for you...and so is Orban.

[www.rfspecialties.com](http://www.rfspecialties.com)

## TECH UPDATES

## SPL De-Esser Drops the Hiss, Keeps the Voice

The SPL auto-dynamic De-Esser removes undesired sibilant frequencies. The company says it does this without compromising the timbre and natural characteristics of a voice, by monitoring the S-frequency spectrum and detecting such frequencies. The de-ess bandwidth is set narrowly around the range of the sibilance, so that neighboring frequencies remain unaffected.

Input processed via this frequency

band is mixed back into the main signal phase-inverted, so that only the S-sounds are cancelled where the S-reduction controller determines the intensity of the phase-cancelled mix. The result is a neutral, unobtrusive de-essing process, which is touted as having a negligible effect on the character and timbre of the voice even at high S-reduction values.

Features include an automatic threshold-adjusting function, which compensates for differences in the input level caused by the varying distance to the mic. This ensures even de-essing independent of signal level, so any necessary compression may be applied post the de-esser.

For more information, including pricing, contact SPL-USA in California at (909) 272-3465 or visit [www.spl-usa.com](http://www.spl-usa.com).

## ENCO's Gardien Defends Against Fines

ENCO Systems introduced Gardien at NAB2004 and won several industry awards including the Radio World "Cool Stuff" Award and the NAB Award for Innovation in Media.

The 2 RU Gardien box takes audio, delays it briefly, monitors the words spoken within the audio to detect indecent words or phrases, then automatically mutes, beeps or reverses them in the outgoing audio.

The supplier says the system uses a speaker-independent, neural network-based speech recognition engine to inspect the audio. Then, with a user-defined list of indecent words and phrases, the unit "surgically" eliminates those words from an air chain, substituting with a bleep, silence or even the reversed audio clip itself.

Guardien then logs the event, and retains a user-definable segment of audio containing the offending material for reference.

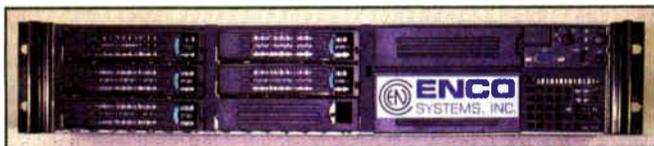
Additionally, the system maintains a separate list of words and phrases that remain logged, without affecting the audio output. This audio segment also is saved to Gardien.

Guardien has balanced analog and AES/EBU inputs and outputs. Words are added to Gardien via a Web-browser interface from any PC.

A failsafe feature is included. If the unit should fail, audio is routed through so there is no interruption on-air. Features include 24-bit analog-to-digital converters operating at 32 kHz, 44.1kHz or 48 kHz, -100dB S/N and 0.002 percent THD+N.

Guardien works with an existing digital delay. Contact closures are provided for control of external devices. The number of words to be deleted or monitored is user-defined; they can be edited easily.

For more information, including pricing, contact ENCO Systems in Michigan at (248) 827-4440 or visit [www.enco.com](http://www.enco.com).

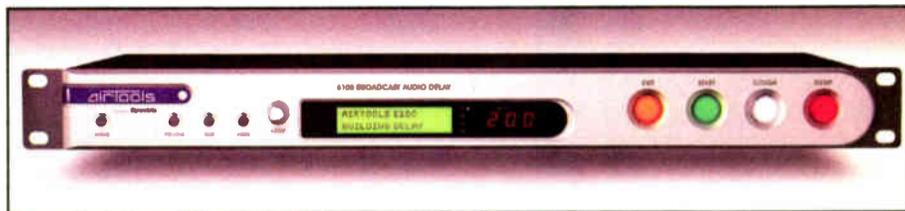


Guardien employs a speech recognition engine and user-defined list of words.

## Symetrix Delay Is Part Of AirTools Line

The 6100 broadcast audio profanity delay from Symetrix Inc. was the first product in the company's AirTools line of audio processing equipment. Based on a predecessor, the 610, the 6100 includes user controls and new features.

The 24-bit digital delay unit for live broadcast prevents profanity or unwanted comments from reaching the airwaves. As a program begins, the 6100 gradually and unobtrusively delays, or stretches out, the program until up to 20 seconds of full-bandwidth stereo is stored in memory. Users prevent offensive material from broadcasting by dumping the unit's buffer, effectively removing the material.



The 24-bit 6100 'stretches out' the program until up to 20 seconds of stereo is stored.

Additionally, the 6100 features automation interface for network broadcasts.

Symetrix also offers the 6200 digital voice processor, a dual-channel unit with two audio pathways capable of processing microphone or line-level sources, independently or as a stereo pair. Signals are converted to 24-bit, 48 kHz digital after passing through the analog input stages. The user can define specific signal processing modules and their order in the signal chain. Creation of voice programs and signal processing parameters may be done from the 6200 front panel or from 6200 Designer, a Windows application. The 6200's security scheme ensures that only authorized personnel may modify programs the station engineer has created.

Featured modules include: high-pass, low-pass and shelving filters; de-esser; downward expander; comp-limiter/AGC-leveler; four-band parametric EQ; and voice symmetry.

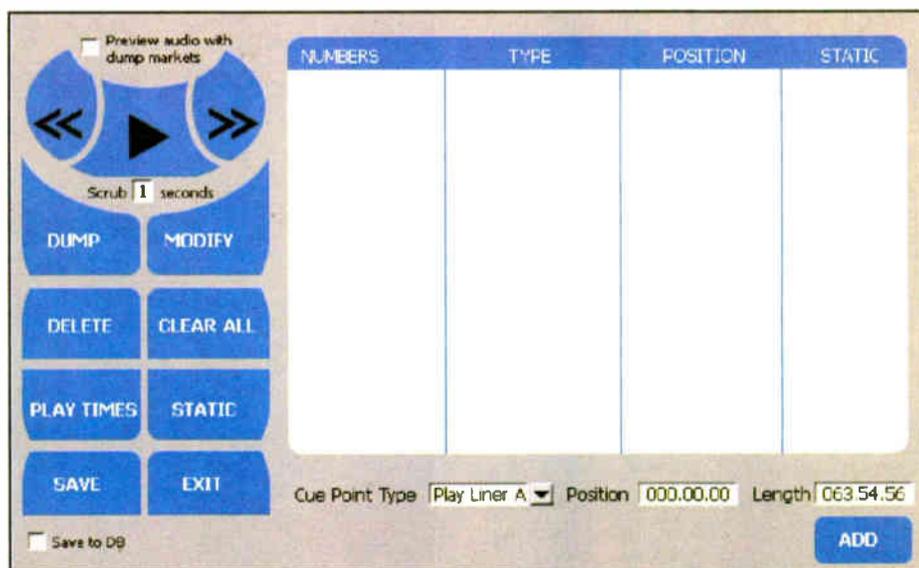
For more information, including pricing, contact Symetrix Inc. in Washington at (425) 778-7728 or visit [www.symetrixaudio.com](http://www.symetrixaudio.com).

## PSI ContentCheck Offers Delay Flexibility

ContentCheck from Prophet Systems Innovations is a content delay system with more than 60 minutes of delay time, enabling stations to record, review and edit programs while they are happening, and tailor programs to the audience market or timeslot.

Audio is recorded, and its output is then delayed for a time determined by the station. During this time and up until the point of airing, any length of audio can be dropped out of the program.

The system is configurable for uncompressed or compressed operation, and digital audio specifications feature configurable audio storage, with sampling rates of 32, 44.1 and 48 kHz using MPEG-1, Layer II or linear PCM uncompressed data formats. While compressed delayed audio is an option, the company says uncompressed operation gives the best delayed-audio performance.



ContentCheck records audio and delays output time for a station-determined time.

Computer speed of PIII 600 or greater with 256 MB RAM is required for ContentCheck, and operating platforms can be Windows 2000 or XP.

The system also can be used to log and archive delayed and non-delayed dayparts. The logging capabilities can be configured for compressed or uncompressed operation; compressed operation at bit rates of 128 kbps or less is recommended for storage efficiency. Depending on the audio card hardware, simultaneous AES/EBU and analog outputs are supplied.

For more information, including pricing, contact Prophet Systems in Nebraska at (308) 284-3007 or visit [www.prophetsys.com](http://www.prophetsys.com).

# High Voltage Rectifiers

Nobody Knows Them Better Than We Do

Once again, HV Components/CKE brings you a reliable retrofit rectifier package for your transmitter that saves you money and delivers the performance and reliability you've come to expect from us. Our Model 51016 shown here is a three-phase full wave bridge designed to easily drop into your AM, FM or television transmitter. Conservatively rated for power supplies of up to 12 KV and 9 amps output, this retrofit package fills the bill for most any application.

**WE HAVE CCA RECTIFIERS**

Quick, Cost-Effective & Expert Solutions

**CKE** [www.rectifiers.com](http://www.rectifiers.com)  
800-649-6370

## TECH UPDATES

## 25-Seven's ATM Manages, Adds Time

The Audio Time Manager from 25-Seven accommodates unexpected events that can disrupt a broadcast schedule by allowing a delayed start of live programs and shortening their duration in real time.

The company says its time compression technology enables an addition of about three minutes per hour to the schedule, or more than double that amount depending on the program source. Acceptable broadcast spoken language quality is maintained.

ATM does not remove important content, change pitch, damage inflection or create annoying artifacts, the company said. It integrates into digital and analog radio facilities for smooth content insertions, network rejoins and broadcast delays.

25-Seven touts benefits for radio stations such as increased program flexibility and the use of its Time/Rate Management Calculator, a software algorithm that evaluates available time and calculates the time compression needed to maximize content; the ability to air live "out-of-schedule" events; and additional time for scheduled insertions.

Additionally, ATM eases the rigidity of back-timed events, enabling an announcer to complete the lead-in to a network feed without having to rush each word. If an important news conference does not have a hard start time, the ATM can capture the actual start, introduce the conference, join the event and catch up to the feed.

There are two modes of operation: assisted mode, in which the user enters a preset and controls ATM using the front-panel transport buttons, browser interface or interconnected studio device; and manual mode, described as an easy interface for one-time applications, and also serving as a failsafe when unexpected events require intervention and total operator control. Presets can be created and recalled, and buttons featuring lighted status indication are included. A large-format LCD offers live feedback on the current program.

For more information, including pricing, contact 25-Seven in Massachusetts at (888) 257-2578 or visit [www.25-seven.com](http://www.25-seven.com).



ATM uses time compression technology that adds three minutes per hour or more to a schedule.

### Dan Dugan D-3 Features Digital I/O

The D-3 automatic mixing controller from Dan Dugan Sound Design is similar to its D-2, introduced in 2002, but offers digital instead of analog I/O.

Dugan controllers are used with multiple live mics and unscripted dialogue for applications such as talk shows, game shows, conference sound reinforcement, dramatic dialogue, wireless mics in theaters and teleconferencing. The controllers typically are connected in the insert points of a console's mic inputs. Each unit handles eight channels, and the units can be linked to accommodate 64 mic channels.



D-3 units handle eight channels individually, up to 64 linked together.

In operation, the mixer leaves the faders up, and the controller takes care of bringing up the mic when a person is talking, and potting down the other mics. Dugan functions are not gating; when no one is speaking, all channel gains are up but pulled back just enough so the total gain is equal to one mic.

When a person speaks, the gain goes to that mic and the others instantly cross-fade down. This algorithm keeps studio noise and PA feedback at the theoretical minimum, but keeps the total gain constant so the room tone stays constant, according to Dugan.

The D-3's inputs and outputs are AES digital audio. The bit depth is 24 and the sample rate is 48 kHz. The inputs have sample-rate converters that can handle from 32 to 96 kHz. Audio can be synchronized to an internal oscillator, any AES input pair, a DARS input or word clock.

For more information, including pricing, contact Dan Dugan Sound Design in San Francisco at (415) 821-9776 or visit [www.dandugan.com](http://www.dandugan.com).

"State of the art technology  
in digital consoles and routers  
for radio and TV"



#### BC2000 D Digital Console

- Cost effective and flexible design
- Multipoint intercommunication and easy multi-studio management capabilities.
- Flexible inputs and outputs allocated to faders.
- Design adaptable to digital and analog environments with all basic broadcasting functions built-in.
- Enhanced interconnectivity between engines through MADI multi-channel links.
- Modular surface control with motorized faders; positions stored on pages.



#### BC2000 D Router

The same router used by the BC 2000D console works as a stand alone router, with 2048 inputs and outputs, summing and processing, with a scalable and modular architecture.

For more information on the BC 2000D Digital Console visit our Web Page

#### AEQ also offers excellent communications and audio equipment

- Stationary and portable ISDN audio codecs and telephone hybrids.
- Advanced multi-channel talk show system.
- Multiplexers, analogue mixing consoles, AD converters, monitors and digital commentary system for large sport events.

#### AEQ

Phone: 866-817-9745  
954-581-7999

Fax: 954-581-7733  
e-mail: [sales@aeqbroadcast.com](mailto:sales@aeqbroadcast.com)  
url: [www.aeqbroadcast.com](http://www.aeqbroadcast.com)

# Products & Services SHOWCASE

## Digital and Analog Switching /Distribution Transmitter Audio Solutions ...



The AES-302 Digital Audio Switcher DA/D to A



The CDS-302 Automatic Composite Audio Switcher/DA



The CDS-300 Composite Audio Switcher/DA

We are proud to introduce the next generation of composite base band and digital audio switchers from bdi. These new designs provide interface, switching and distribution solutions for your transmitter site. Use these quality products for confidence monitoring and switching functions made necessary by today's competitive environment. Eliminate embarrassing off the air outages caused by path losses. Visit our web site or call us for complete information about these versatile transmitter audio solutions which will provide complete confidence in your signal integrity and reliability.

**Broadcast Devices, Inc.**

Tel. (914) 737-5032 Fax. (914) 736-6916  
www.Broadcast-Devices.com

**bdi**

## Telephone Solutions by CircuitWerkes



**The HC-3 hybrid telephone autocooupler**  
The HC-3 is ideal for many tasks like listen & concert lines, remote broadcasting, IFB interfaces, & More.

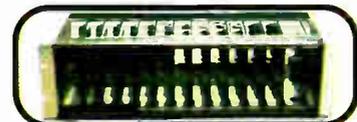


**The New Telco-6, six line, incoming, ring detector**  
Is someone calling? Find out with the new Telco-6! The telco-6 detects telephone ring signals from one to six lines and provides a dry relay output for each line.

*More Features.  
Better Price.*



**CP-1 & CP-2 call progress decoders**  
Did you ever connect a telephone coupler to a phone line or PBX only to discover that it won't hang up? CircuitWerkes' call progress decoders can save the day on most systems. They listen for dial-tone or busy signals and, when present, force your couplers offline.



**The AC-12 telco autocooupler bank**  
Get up to a dozen, full featured, telephone autocoouplers in just 5.25" of rack space. The coupler bay features a common power supply and two audio busses for easy mass feeds. Individual couplers can be used for sending or receiving separately from the rest - perfect for IFBs. Newly updated design improves audio performance and overall reliability to a new standard of excellence!

CircuitWerkes - (352) 335-6555 Fax 380-0230 <http://www.circuitwerkes.com> 2805 NW 6th Street, Gainesville, FL 32609

## Hear Every Nuance

**MatchMaker™**  
High Definition Audio  
RCA to XLR and XLR to RCA  
Level / Impedance Converters

New Proprietary UniQ™ Technology



No Compromise Sound Quality with Transformer Isolation  
+28dB Headroom THD and IMD <0.005% SNR > 105dB

Hear why more Engineers and Sound Professionals are specifying ATI.  
For your nearest Dealer call 1-800-922-8001 or visit our new webpage at [www.ATIaudio.com](http://www.ATIaudio.com)

# \$999

## VoxPro PC

Fast, Simple, 2 Track  
voice/phone Editing,  
Networking: Instantly share files  
room to room, user to user!

**MP3**  
Import-Edit  
WAV WMA TOO

206.842.5202 x204  
[www.audionlabs.com](http://www.audionlabs.com)

## RECEIVERS

**OUTSTANDING** specifications and pricing on professional quality receivers for **EAS**, monitoring and translators.

The **AFC3** is a three receiver rack mount that is configured to your **EAS** or monitoring specific application. Each receiver has internal frequency selection (PLL) switches, front panel controls and indicators, and rear panel connections.



**Price: Approximately \$1200** (depending on receiver choice)

Select three receivers from our FM or FM/SCA, NOAA Weather, Public Service and/or AM Monitor/Receivers. All receivers are PLL (synthesized) designs using the latest state of the art components and are available as stand alone receivers as well as in AFC3 combinations.

**DAYTON INDUSTRIAL CORPORATION**

2237 Industrial Blvd., Sarasota, FL 34234 Tel. (941) 351-4454  
Email: SCARadio@aol.com WebSite: [www.DaytonIndustrial.com](http://www.DaytonIndustrial.com)

Quality Receivers Designed and Manufactured in the USA since 1980



**PRE-OWNED  
BROADCAST EQUIPMENT**

**Buy with  
confidence!**

All equipment is sold with documentation and  
a 30-day Limited Warranty.

We also repair and refurbish PR&E  
consoles, modules and accessories.  
We speak BMX-I, II, III, AMX,  
ABX, Newsmixer,  
Stereomixer & Radiomixer.

Visit our web site for available equipment  
and news updates.

[www.mooretronix.com](http://www.mooretronix.com)



**800-300-0733**

TECH UPDATES

### OMT Develops Profanity Tool

OMT's digital profanity and indecency elimination tool, iMediaLogger, enables a radio station to time shift and delay broadcasts, auto-record "best of" shows without spots and archive historical content. The unit works with automation systems, switchers, satellite receivers, external closure devices and silence alarms, replacing traditional recording systems that tend to require maintenance.

It records up to 12 stereo/mono audio sources simultaneously, and supports multiple compression formats, such as MP2, MP3, Windows Media Audio, Real Audio and PCM. Four recordings can be made on one record input, and the system can be remotely configured and managed on LAN/WAN. Features include the ability to split each source into four streams, as well as multiple recording modes like Digital Logger, Mic Skinner, Reverse Skinner and Time-Shift Recorder.

iMediaLogger's hardware requirements include an Intel Pentium III 700Mhz or higher; 128 MB of RAM (256 MB recommended); 50 GB free hard disk and CD-ROM drive; Windows-compatible 32-bit sound card; 1024x768 video resolution; and an additional hard disk for audio storage.

For more information, including pricing, contact OMT in Canada at (204) 786-3994 or visit [www.omt.net](http://www.omt.net).



iMediaLogger records up to 12 stereo/mono audio sources simultaneously, and supports multiple compression formats.

### Orban Optimod-FM 2300 Enhances Stereo

Orban made available its 1 RU Optimod-FM 2300 audio processor. It is based on the Optimod-FM 2200 and includes features such as stereo enhancement based on the company's 222 standalone model, Ethernet and RS232 serial connectivity, remote control through Windows 2000 or XP PC and AES/EBU digital input/output. Also featured is a multiplex power controller for countries required to meet the ITU-R BS412 standard.

Additionally, Orban touts the inclusion of its "Half-Cosine Interpolation" composite limiter, which protects stereo imaging and prevents interference to the stereo pilot tone and subcarriers.

The 2300 is targeted at small- and medium-market broadcasters. The company says the unit is useful for radio networks where a higher-end processor conditions the audio feed at the network origination point, while each transmitter uses a 2300 to eliminate STL-induced overshoots, ensure legal modulation and process locally inserted material.



The unit features a 'Half-Cosine Interpolation' composite limiter.

Optimod-FM 2300's processing chain features an AGC, equalizer, program-adaptive high-frequency enhancer, distortion-canceling clipper, overshoot compensator and stereo encoder with composite limiting. The main clippers and overshoot compensator operate at 256 kHz sample rate and are anti-aliased. The two-band compressor operates with phase rotation or in constant-delay mode, which Orban says lets the user choose processing for loudness or quieter, "purist" processing.

Unlike the 2200, switching between these styles occurs with no audio mutes, making the unit suitable for the mixed formats used by many non-commercial and educational broadcasters. The 2300's stereo enhancer detects attack transients in the L+R signal and uses these to trigger expansion of the L-R signal, increasing the apparent width and detail of the signal without exacerbating multipath distortion.

Additional features include dual-band technology with window gating, enabling the AGC to correct gain riding errors quickly without increasing the density of material that is already well controlled in level, useful for processing highly-compressed CDs.

For more information, including pricing, contact Orban in California at (510) 351-3500 or visit [www.orban.com](http://www.orban.com).

## Products & Services SHOWCASE

### NEW! StudioDrive makes your PC a studio-in-a-box!

Shown actual size! It mounts in your PC!



- Mic input w/ remote
- 4 stereo Line inputs
- Telephone coupler
- Mix-minus built in
- Monitor system w/ automatic muting
- AIR Monitor input
- Mic Tally controls
- On The Air lights
- Headphone output

StudioDrive is a 6-input stereo mixer that makes your PC a self contained fully integrated studio! Perfect for radio automation, newsrooms, PC edit suites, emergency studios, remotes, LPFM.

Only \$595! Datasheet at [www.henryeng.com](http://www.henryeng.com). Call 626-355-3656 or any Henry dealer.



# Products & Services SHOWCASE

Buy simplicity,  
reliability and service

## EAS

Price \$1750.00

Equipment is in stock for  
immediate delivery!

**GORMAN-REDLICH MFG. CO.**  
257 W. Union St. Athens, Ohio 45701

Phone 740-593-3150  
FAX 740-592-3898

Now available  
with optional DTMF  
control via a phone line.



- 5 two-way RS-232 inputs/outputs for computer, remote signboard & character generator
- 6 audio inputs on standard models. All audio inputs & outputs are transformer isolated from encoder-decoder board
- Automatic interruption of program audio for unattended operation
- 4 line 40 character LCD display with LED backlighting
- 20 key keypad to program unit, set modulation level, set input levels
- Will handshake with automation equipment [jimg@gorman-redlich.com](mailto:jimg@gorman-redlich.com) Web Site: [www.gorman-redlich.com](http://www.gorman-redlich.com)
- 2 year warranty
- 2 minutes of digital audio storage
- 25 pin parallel printer port for external printer
- 52 terminals on the rear to interface with other equipment by removable plugs
- BNC fitting with 600ohm balanced audio out for second transmitter

◆ Also available: weather radios, antennas for weather radios, crystal controlled synthesized FM digitally tuned radios, remote signboards, cables for interconnection, character generators.

**SIX MILLION  
THUNDERSTORMS HIT  
PLANET EARTH EVERY YEAR!  
IT TAKES ONLY ONE TO  
PUT YOU OFF THE AIR!**



The STATI-CAT LIGHTNING PREVENTION SYSTEM provides a continuous, low-resistance discharge path for the static electric charge on tall structures. Dissipation points are 1/8" stainless steel rods.

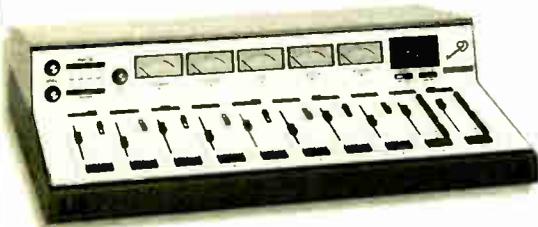
This affordable and rugged system has proven itself in the field for over 20 years.

**Cortana**  
Corporation Inc.

Write or call for a free brochure and design  
P.O. Box 2548, Farmington, N.J. 87499-2548  
Toll Free: 888-325-5336 • Fax: 505-326-2337 • [www.cortanacorporation.com](http://www.cortanacorporation.com)

Looking for Reliability, and Affordability?

Have you forgotten about the  
"CLASSIC"  
PACEMAKER 1032?



**AUTOGRAM**  
800-327-6901  
[www.autogramcorp.com](http://www.autogramcorp.com)

## SHOCK & AWE!

Avoid any unnecessary shock to your equipment. The next time you ship your rack mountable equipment insist on a shock absorbing and secure environment. Our shock-protected shipping cases have an inner rack shell, surrounded with shock absorbing foam for superb shock-isolation while in transit.

8 RU 24" Deep - only \$ 629  
12 RU 24" Deep - only \$ 699

For other sizes, configurations and options

Shop Star Case Online  
[www.starcase.com](http://www.starcase.com)  
[info@starcase.com](mailto:info@starcase.com)

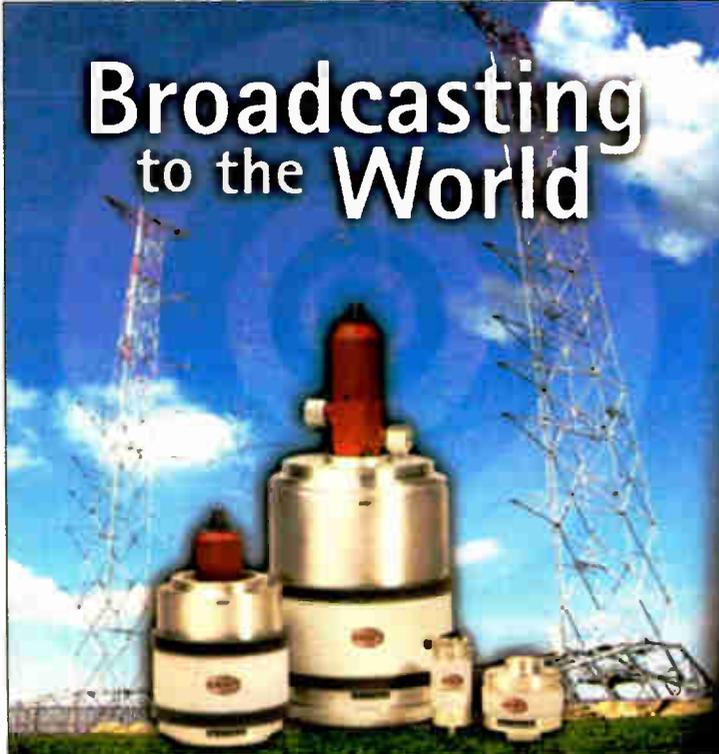
Toll Free 800-822-STAR (7827)  
Toll Free 800-782-CASE (2273)



**SHOCK  
PROTECTED**

8 Rack Unit (14") High, 24" Deep  
2" Foam-Isolated Inner Rack Shell  
Front & Rear Lids & Tapped Rails  
3 1/2" Swivel & Locking Casters

## Broadcasting to the World



**COMET NORTH AMERICA**

421 Wards Corner Road  
Cincinnati, Ohio 45140  
Ph: (513) 831-5000  
Fax: (513) 831-7889  
[www.cometna.com](http://www.cometna.com)

- Full range of antenna capabilities for Broadcasting
  - Fixed and Portable
  - All Band/VHF/Coded
- Standard equipment in all major AM & SW transmitters
- Professional HV test equipment to regularly test repairs
- Teamed in North America with Kintronic Labs to provide engineering expertise to broadcasters



Kintronic Labs, Inc.  
144 Parkside Drive Road  
Burlingame, CA 94010  
Ph: 415-339-3141  
Fax: 415-339-4224  
[www.kintronic.com](http://www.kintronic.com)



- ✓ Competitive Prices
- ✓ Extensive Rental Fleet (RF Coders Test Equipment, Audio)
- ✓ Experienced Staff
- ✓ Used Trade-Ins Welcomed
- ✓ New and Rebuilt RF and Audio
- ✓ Custom Studio Design and Furniture
- ✓ Representing Over 600 Quality Manufacturers
- ✓ Turnkey Installations Available

**You Know We Know Radio**

800-438-6040 • [www.scmsinc.com](http://www.scmsinc.com) • Fax 704-889-4540

TECH UPDATES

## Yamaha Has Mixing Engines In DME Processor Series

Yamaha Commercial Audio introduced two additions to its DME series of programmable DSP processors. The company says the DME24N and DME64N digital mixing engines have improved DME programming and control software, more DSP power and the ability to control the system from Ethernet, USB, RS232/422 or MIDI.

The DME24N offers up to 24 channels of I/O, including eight analog I/O. Inputs accept mic/line level, and additional digital and analog I/O are available by way of an MY mini-YGDAI card slot. Remote connections include eight Euroblock-type GPI connectors.



The DME24N and DME64N offer four control-panel options, including Ethernet-equipped ICP1 digital display.

The DME64N features up to 64 channels of I/O, with four mini-YGDAI slots that accept a range of eight- or 16-channel digital and analog I/O cards. A cascade connection enables up to eight DME64N units to work in tandem, or to connect to Yamaha's PM5D mixing console.

Both units include a headphone output for direct monitoring, and the choice of four control-panel options: the GPI-equipped CP4SF (four-button/four-fader); CP4SW (four-button); CP1SF (single-button/single-fader); and the Ethernet-equipped ICP1 digital display with LCD readout, six buttons and parameter wheel.

The company suggests the inclusion of its PM5D console and 16-channel MY16-C CobraNet YGDAI expansion card for a complete system. The MY16-C features primary and secondary Cobranet ports, and enables a smooth audio connection with a Cobranet network.

Additionally, it provides integrated control between the DME and PM5D. Using direct control, the PM5D can use the DME24N or DME64N as a matrix expander (max. 40 x 60 matrix with DME64N); speaker controller (crossovers, EQ and delay); and an effects expander (graphic EQ and multi-effects).

For more information, including pricing, contact Yamaha Commercial Audio in California at (714) 522-9011 or visit [www.yamaha.com/proaudio](http://www.yamaha.com/proaudio).

## Omnia

► Continued from page 31

With 50,000 watts 2,000 feet from the car, the RF ACG in the radio should have been begging for mercy. We set the radio to analog-only and punched up the competition. Then we hit the WOR button — and almost blew the doors off the car.

Sitting right in front of the competition, we were louder and the signal had oomph. Switching to the HD audio, we found it cleaner than with our processor.

My only complaint was the analog was too boomy. Frank loves his bass, and the Omnia 5-EX can deliver. We decided to leave well enough alone for the evening.

Driving in the next morning, the analog signal was loud and the HD Radio sounded clean. But I thought the analog audio was still too boomy. So at the office, I logged into the unit from my desk over IP, used the remote software to make a few adjustments, and had WOR sounding just the way it should — loud, but not fatiguing.

I did note a unique phenomenon on the HD Radio side. I live about 50 miles north-northwest of the transmitter in the null, and

I have never been able to get the HD signal in the morning until I hit the New York/New Jersey line on Route 17. That first morning, imagine my surprise when sitting at a traffic light in Monroe, N.Y., the radio pops into HD Radio mode in a place where the HD signal shouldn't exist.

I thought it must be a fluke and dialed into the remote control to check antenna parameters. They were fine. It appears using the 5-EX may have slightly increased our HD coverage. The unit's analog audio sounds smoother than our previous processing, and the high-frequency rolloff does not seem to have a "splash" to it. I wonder if the splashing I was hearing interfered with the HD carriers. The extended HD coverage continued, so it was not a fluke.

Do we like the Omnia 5-EX on WOR? Definitely. This processor is configurable, and should enable the user to get the desired sound on any format. Foti hit a home run with this processor. I put it into the rack with a spot welder, and if he thinks he's going to get this one back, he's sorely mistaken.

For more information, including pricing, contact Omnia Audio in Cleveland at (216) 241-3343 or visit [www.omniaaudio.com](http://www.omniaaudio.com).

Company: Ward-Beck Systems Ltd.  
Product: ALFA Audio Leveller for Audiophiles



ALFA helps you maintain a target level.

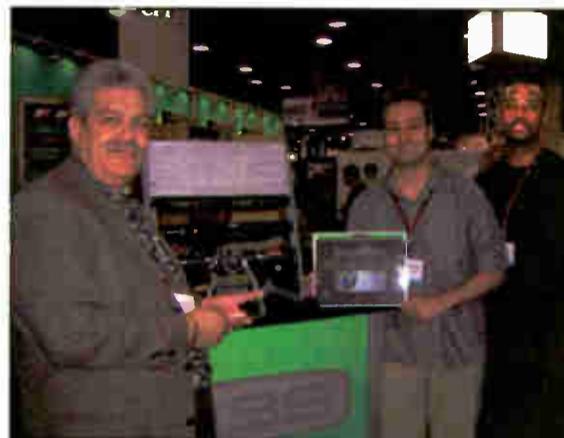
It can be used at the input or output point to maintain a constant program level. It compensates for miscalibrated incoming signals or hot CDs, and allows you to deliver level-controlled signals to other parties who may be operating at different plant levels.

Signal processing takes place in the digital domain; no conversion artifacts are introduced. It's a card-based system so it's small and can be outfitted as you need it; the box can handle up to eight AES channels of control in a 1RU frame and 20 channels of control in a 2RU frame.

Control can be automatic, or adjusted via a control panel. Unlike a compressor/expander, ALFA responds slowly in order to minimize the potential to change the dynamics of the signal; instead it acts to adjust the long-term average level of the signal.

Retail price ranges from \$2,000 for two AES channels to \$8,600 for 20 AES channels; larger systems are priced individually.

Eugene Johnson, Michael Jordan and Tim Clarke are ALFA males. Info: (800) 771-2556 in Toronto, Ontario, or [www.ward-beck.com](http://www.ward-beck.com).



## WE GIVE YOU WIRE

Name: Guy Wire

Occupation: Holding up radio towers, and reporting on the industry that uses and maintains them.

Certifications and industry honors: Nothin' yet. I don't think they give honors to masked men.

Your mentor or hero: Paul McLane. And Randy Michaels, who started as an engineer and rose to rule a radio empire.

Favorite station growing up: KHJ, KYA, WLW, WLS, KOMA, WABC, WPGC, WIBG and sooooo many more!

Other: Keeping up with all the changes in radio leaves little time to use my hot soldering gun. But it's still fun to pull the trigger.



Radio World's pages are home to the finest writers and columnists in the industry. Like Guy Wire. Just one more reason we're the newspaper for radio managers and engineers.

## You can measure... with the best monitor and the most accurate test set.



The FMM-2/FMS-2 series monitors provide an even greater degree of measurement than ever before. You can measure S/N below 90 dB. You can measure crosstalk below 85 dB. You can measure separations of better than 70 dB. You can measure frequency response to better than 0.25 dB. You can measure distortions to lower than 0.01%, and much more... Our uncluttered panels and auto-ranging voltmeters make these measurements a dream.



**BELAR**  
ELECTRONICS LABORATORY, INC.  
118 LANCASTER AVENUE • RD. BOX 76 • DEVON, PA 15333-0076 USA  
(610) 887-5500 • FAX (610) 887-2388 • [WWW.BELAR.COM](http://WWW.BELAR.COM)

Call, write or FAX for more information on Belar AM, FM, Stereo, SCA and TV monitors.

# BROADCAST

## Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

### ACOUSTICS

#### Want to Sell



Full product line for sound control & noise elimination.

[www.acousticsfirst.com](http://www.acousticsfirst.com)

### AMPLIFIERS

#### Want to Sell

AudioClassics.com Buys - Sells - Trades - Repairs Vintage & High-End Audio Equipment. 800-321-2834 or [steve@audioclassics.com](mailto:steve@audioclassics.com).

Gates M5575 tube type monitor amplifier. Al Sargent, KRWS, 310 North Center Ave, Hardin MT 59034. 406-665-1832.

### ANTENNAS/TOWERS/CABLES

#### Want to Sell

#### AM Ground Systems

Reliable, On-time Installation  
Quality Workmanship  
Ground System Evaluation  
and Repair  
[www.amgroundsystems.com](http://www.amgroundsystems.com)  
1-877-766-2999

Andrews Coax HCC-300. 900' already on the spool waiting to be picked up by buyer. This line was installed in 1982 and removed from service back in November. Just like the antenna I listed it is located in Alert, NC awaiting it's new owner. Asking \$2500. Email [Mraley@bbnradio.org](mailto:Mraley@bbnradio.org) for pictures.



Shively Labs 6810-6R-DA antenna. This antenna is tuned to 92.5FM with a gain of 6.09 and db of 7.85. This was originally installed in 1986 and removed from service back in November. System also included radoms for ice protection and is 20 dbk max. Pictures are available so e-mail [Mraley@bbnradio.org](mailto:Mraley@bbnradio.org) for the full scoop. Asking \$20,000. buyer responsible for pick-up and delivery. This system is located in Alert, NC.

**Why Buy a Used Antenna. When you can Buy a New Antenna for about the Same Price**  
contact **Benny Springer 800/696-7919**  
**Superior Broadcast Products**  
**Factory Direct Prices to you**

Myat 601-001, 6-1/8" 50 ohm rigid line, (80) 20' sections with hangers, \$300 each. Neal Peden, ABC Radio, Dallas, 2221 East Lamar, S300, Arlington TX 76006. 817-695-0831.

Rohn 190' communication tower, buy wires included, \$4950/BO. Joseph Rateau, KGOY, 8264 S Cody St, Littleton CO 80128. 303-972-6269.

Utility tower, 190', UTC type 480 pipe FM, \$8750/BO. Joseph Rateau, KGOY, 8264 S Cody St, Littleton CO 80128. 303-972-6269.

### AUDIO PRODUCTION

#### Want to Sell

Arrakis 500SC analog mixer, 8 stereo channels, ideal for small on-air production or new studio, like new, well maintained, \$800. A. Martin, Seque Services, 2751B County Road 3, Merrifield MN 56465. 218-765-4321.

### AUTOMATION EQUIPMENT

#### Want to Sell

Smartcaster Live Assist/CD, comes with 8 Pioneer 18-disc CD players, computer, new rack. Can run 24/7. Runs great. \$2500. John Wilsbach, WMSS, 214 Race St., Middletown PA 17057. 717-948-9136.

### CART MACHINES

#### Want to Sell

AudiCord R/P stereo cart machine. Al Sargent, KRWS, 310 North Center Ave, Hardin MT 59034. 406-665-1832.

ITC R/P stereo cart machine. Al Sargent, KRWS, 310 North Center Ave, Hardin MT 59034. 406-665-1832.

### COMPLETE FACILITIES

**NEW OR USED COMPLETE PACKAGES**  
STUDIO/STL/TRANSMITTER/ANTENNA OR ANY COMBINATION OF ABOVE.  
-LEASE OPTIONS-  
-EMERGENCY RENTALS-  
-REMOTE BROADCAST RENTALS-  
SCMS, Inc. (800) 438-6040  
"You Know We Know Radio"

### CONSOLES

#### Want to Sell

Gates Diplomat, solid state, 10 pot mono audio console. Al Sargent, KRWS, 310 North Center Ave, Hardin MT 59034. 406-665-1832.

Ramko DC38-5S stereo audio console. Al Sargent, KRWS, 310 North Center Ave, Hardin MT 59034. 406-665-1832.

### LIMITERS/AUDIO PROCESSING

#### Want to Sell

Inovonics Model 222 "NRSC" (AM) audio processor with instruction, maintenance, operating manual, \$500. Don De Rosa, WAMF, 315-593-1300, email: [WAMF1300@alltel.net](mailto:WAMF1300@alltel.net).

### Want to Buy

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

Inovonics 222, must be in good working order. Michael Cardillo, 151 Morgan St., Cranston RI 02920. 401-942-8341.

Used AM processor, \$250, must be in good working order. Michael Cardillo, 151 Morgan St., Cranston RI 02920. 401-942-8341.

### MICROPHONES

#### Want to Buy

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

### MISCELLANEOUS

#### Want to Sell

ROTRON BLOWERS AND FLATE BLOCKERS new & rebuilt for Elcom, Harris, CCA, CSI, McMartin, Goodrich Ent. 11435 Manderson St. Omaha, NE 68164 402 493 1886 FAX 402 493 6821

Proteck 20 MHZ Spec. analyzer (A-3502). Make a decent offer. Call Michael Raley (704) 523-5555 or e-mail [Mraley@rrb.org](mailto:Mraley@rrb.org).

### MONITORS

#### Want to Sell

Belar AMM-1 frequency & modulation monitor with instruction book, \$500. Don De Rosa, WAMF, 315-593-1300, email: [WAMF1300@alltel.net](mailto:WAMF1300@alltel.net).

Belar FM mod monitors (2), \$900 +shpg; Belar FMS 2 stereo mod monitor, \$1000 +shpg. Curt Marker, Gospel Opportunities, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

### RECORDERS

#### Want to Sell

Revox B-77 stereo r-r tape recorder, \$800. Don De Rosa, WAMF, 315-593-1300, email: [WAMF1300@alltel.net](mailto:WAMF1300@alltel.net).

Scully type 270 r-r, PB only. Al Sargent, KRWS, 310 North Center Ave, Hardin MT 59034. 406-665-1832.

Tascam F32, rack mounted, \$800/BO +shpg. Curt Marker, Gospel Opportunities, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.



### REMOTE & MICROWAVE

#### Want to Sell

**WE RENT FOR LESS**  
Blueboxes FM Exciters  
Zephyrs FM Power Amps  
POTS Codecs STL's  
RF/Audio Gear Test Equipment  
If we don't have it, we will get it!  
SCMS, INC. (800) 438-6040  
"You Know We Know Radio"

1987 WIL Trailer, 30' broadcast trailer complete, Marti unit stereo console, JBL speakers, & more, pics available, \$12,750/BO. Joseph Rateau, KGOY, 8264 S Cody St, Littleton CO 80128. 303-972-6269.

1995 Winnebago Adventurer, 35' with less than 5000 actual miles, Allison auto trans, 2 Onon 6KW gen sets, 2 AC's, 25' awning, exterior lights, would make great remote vehicle or conversion, pic available, \$34,500/BO. Joseph Rateau, KGOY, 8264 S Cody St, Littleton CO 80128. 303-972-6269.

### SATELLITE EQUIPMENT

#### Want to Sell

MPEG-2 Satellite Receivers, LNBs, C & Ku Band Equipment. [www.daveswebshop.com](http://www.daveswebshop.com), 479-997-2230.

Wegner DN 86 Digital Audio Receiver 3944.1 MHZ - \$100.00 "as is" plus shipping and handling - Call Michael Raley @ (704) 523-5555 for more information or e-mail [Mraley@rrb.org](mailto:Mraley@rrb.org) for a picture.

Zephus 4 card #304 satellite mainframe, excel cond, BO +shpg. Curt Marker, Gospel Opportunities, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

### STATIONS

#### Want to Sell

1000 Watt Full Time AM in Northeast Mississippi. Will sell with financing. 662-423-9919.

W254AJ (98.7FM) in Erie, Pennsylvania. This is a 200 watt translator at 204 feet above the ground in the center of Erie. Great coverage no interference problems. Asking \$75,000 plus assume five year lease renewing June of 2007. Currently paying \$365.77 per month. Equipment included. Please contact Michael Raley at 704-523-5555 or email at [Mraley@bbnradio.org](mailto:Mraley@bbnradio.org).

#### Want to Buy

Looking for AM and/or FM stations in Florida. Michael Cardillo, 151 Morgan St., Cranston RI 02920. 401-942-8341.

Radio Station C.P., AM or FM, in RI area. Will pay highest price. Call after 6PM EST, M-F. Michael Cardillo, 151 Morgan St., Cranston RI 02920. 401-942-8341.

Radio stations AMs, FMs, translators, in RI area. Will consider partnership. Call after 6PM EST. Michael Cardillo, 151 Morgan St., Cranston RI 02920. 401-942-8341.

### STEREO GENERATORS

#### Want to Sell

Moseley type accepted composite STL 6010 transmitter, S.N. 77968-9820 + PCL 606 receiver S.N. 61040, as new, 948.000 MHZ, \$4995. James Phillip, WOOO FM, 2125 Ginter, Defiance OH 419-782-8592.

**VSoft COMMUNICATIONS**  
R.F. Communications Software and Engineering Consulting

**The Leader in Broadcast Engineering Software**

Professional Software packages for FCC applications and predicting coverage.

- Create stunning "real-world" coverage maps and interference studies using Longley-Rice, PTP, Okamura/Hata and FCC with Probe 3™.
- Search for FM channels under spacings and contour to contour protection using FMCont™.
- Prepare AM skywave and groundwave allocations studies and map FCC contours with AM-Pro™.
- Plot STL paths over 3D terrain with Terrain-3D™.

Quality custom mapping and FCC engineering consulting available.  
[www.v-soft.com](http://www.v-soft.com) (800)743-3684

100 KW driven by 6 cyl Detroit industrial engine, low hours, former IMTS unit for AT&T, \$24,500/BO. Joseph Rateau, KGOY, 8264 S Cody St, Littleton CO 80128. 303-972-6269.

Onan 15 KW air cooled gas, 3 phase, totally rebuilt, low hours, can be converted to propane, \$12,500/BO. Joseph Rateau, KGOY, 8264 S Cody St, Littleton CO 80128. 303-972-6269.

### STUDIO EQUIPMENT

#### Want to Sell

ATI Audio Distribution Amplifier 2016-1. We have about 10 of these as a result of studio renovations. They cost over \$1,100.00 new but will let these go for \$160.00 each plus S&H. Contact Michael Raley at (704) 523-5555 for more information or e-mail [Mraley@rrb.org](mailto:Mraley@rrb.org) for a picture.

Audio Cord Cart machines. We have about Several "E" series playbacks at \$20.00 each, 10 "DL" series playbacks and two "A" series playbacks at \$20.00 each. Most of them have been refurbished. We also have one "A" series P/R mono, two "E" series p/r mono and two "DL" series p/r mono. Call Michael Raley @ (704) 523-5555 or e-mail [Mraley@bbnradio.org](mailto:Mraley@bbnradio.org) for more information. No connectors are available. Will sell "as is". Shipping and handling charges apply. Call Michael Raley @ (704) 523-5555 or e-mail [Mraley@rrb.org](mailto:Mraley@rrb.org) for some pictures.

Enberg BA - 6 Annunciator. Have several of them in great condition with no more than eight years of use in them. Original cost was \$359.00 each but we will sell them for \$150.00 each "as is" plus s/h. Call Mike R at (704) 523-5555 or e-mail [Mraley@rrb.org](mailto:Mraley@rrb.org) for more information.

Ten Nidec motors for Audio-cord "E" series. 117v 6H 3.1w 0.2amp 12p and 600rpms. Will sell "as is" for \$5.00 each. Working condition just somewhat noisy. Call Michael Raley (704) 523-5555 or e-mail [Mraley@rrb.org](mailto:Mraley@rrb.org) for pictures.

TFT 713 AM Frequency and Modulation Monitor. Cost \$3,400.00 new but will sell for \$1000.00 plus S&H. Needs re-calibration. Call Michael Raley at (704) 523-5555 or e-mail [Mraley@rrb.org](mailto:Mraley@rrb.org) for a picture.

Two Denon DNM 1050R Professional Mini-disc Rec/PB Deck. Both units manufactured in 2001 and were used on our test bench in our downlink room. Has low impedance and headphone jack. We are asking \$475.00 for each unit plus shipping and handling. I can e-mail two pictures and the "Main Features" portion of the manual. Please contact Mike Raley or Ron Muffley at (704) 523-5555 for more information or e-mail [Mraley@rrb.org](mailto:Mraley@rrb.org) for pictures.

Two RTS 416 Distribution Amplifiers. Has slight problem pushing +4. Cost \$1,173.00 new but will take \$300.00 for each unit plus S&H. Call Michael Raley at (704) 523-5555 or e-mail [Mraley@rrb.org](mailto:Mraley@rrb.org) for a picture.

**PROMOTE YOUR BUSINESS!**  
**ADVERTISE!**  
For more information, call **Simone Fewell at 703.998.7600, ext. 154.**

### TAX DEDUCTIBLE EQUIP

A non-profit 501(c)(3) Christian Ministry, seeks tax deductible donations of working professional grade live/post radio production equipment of studio automation systems, modulation monitors, DAT, CD players, mikes, turntables, mixing boards, and other radio production equipment. Also, need transmitters, translators, transmission lines, and antennas to be used in our Youth Radio Ministry Training Program. All donations will receive a tax deductible receipt and God's blessings for their donations. Minister Dr. R. Hodges, 916-721-3285 or [info@lwcr.org](mailto:info@lwcr.org).

## TRANSMITTERS

### Want to Sell

(5) Five KW FM's; (5) 10 KW AM's; CSI T-25-F 25 KW (GG) FM; (5) 5KW AM Harris MW-5-B. Continental Comm., 314-664-4497, ContComm@sbcglobal.net.

CCA FM25000DS with 802A Exciter. New tubes and spares. \$12,500. 812-587-5637 bob53bob@hotmail.com.

McMartin BF-5K, 5kW FM. Factory rebuilt in perfect, like new condition, includes new tubes, tested & tuned on your frequency. Guaranteed, fully adjustable from 0 to 5.5 kW. Goodrich Enterprises Inc, 402-493-1886.

QEI FMQ series 6.0 to 9.6FM. This xmitter did a tour of duty in Argentina but some goofy laws in this country made it impossible to permit the station to operate at this power. To make a long story short it was only in operation no more than four months. Will let this go for \$18 ,000.00. Call Mike Raley at (704) 523-5555 or E-mail [Mraley@rbt.org](mailto:Mraley@rbt.org) for pictures.

**BEXT**  
From the tall to the small  
[WWW.BEXT.COM](http://WWW.BEXT.COM)  
**888 239 8462**  
Transmitters & Antennas

**BESCO** World Leader in AM - FM Transmitters  
"Now in our 34th year"  
**AM & FM Pre-Owned Units In Stock**  
All Powers • Manufacture • Instruction Books • Spares & All Complete  
Visit our Website:  
[www.besco-int.com](http://www.besco-int.com)  
Or Call Rob Malary, National/Int'l Sales at **321-960-4001**

Gates 250 watt FM transmitter with TE-3 exciter. Al Sargent, KRWS, 310 North Center Ave, Hardin MT 59034. 406-655-1832.

Harris/Gates BC-500G, 500/250 watt, \$1800. Laurie Foster, X-Star, 422 1<sup>st</sup> St., Manister MI 49660. 231-723-9433.

**OFF THE AIR? Emergency Back-up Rentals**  
FM Exciters - STLs - FM Pwr Amps - Antennas - Studio & Test Equipment  
**SCMS Inc (800) 438-6040**  
"You Know We Know Radio"

Nautek ND-1, 1 KW AM transmitter, excellent condition, \$8500. Laurie Foster, X-Star, 422 1<sup>st</sup> St., Manister MI 49660. 231-723-9433.

**Why Buy a Used Transmitter. When you can Buy a New Transmitter for about the Same Price contact Benny Springer 800/696-7919 Superior Broadcast Products Factory Direct Prices to you**

QEI 675 FM exciter 5-20 watts, freq agile, \$1500 +shpg; QEI Quantum "E" 300 watt xmtr & exciter combo, freq agile, \$4000. Curt Marker, Gospel Opportunities, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

Tepeco J540 translator completely gone through by factory will be shipped from there, \$2282 +shpg. Curt Marker, Gospel Opportunities, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

RCA BTA1S 1000/500 watt bdct xmtr with new matched pair of 400-C power tubes plus spares. AM crystal oscillator at 1300 with manuals, \$3000. Don De Rosa, WAMF, 315-593-1300, email: [WAMF1300@alltel.net](mailto:WAMF1300@alltel.net).

**Radio World**  
Broadcast Equipment Exchange  
To advertise, call 703-998-7600, ext. 154

## CONSULTANTS

**Consulting Communications Engineers EMC Test Lab**  
• FCC Applications and Field Engineering  
• Frequency Searches and Coordination  
• AM-FM-CATV-ITFS-LPTV  
• EMC Test Lab-FCC and European (IEC)  
**OWL ENGINEERING, INC.**  
E-mail: [info@owleng.com](mailto:info@owleng.com) **651-784-7445** Fax (651) 784-7541  
5644 Hamline Ave. N., Shoreview, MN 55126 \*Member AFCEE\*

**FASTER... MORE ACCURATE RADIO COVERAGE**  
• Real Time 3-D Displays  
• Interference calculations  
• Cost effective mapping  
• Fully integrated databases  
• Used by the FCC  
• Latest standards built-in  
**RADIO SOFT**  
Visit us on the web at [www.radiosoft.com](http://www.radiosoft.com)  
101 Demarest Sq. #E, Demorest GA - 706-798-6811

**System One Communications**  
Broadcast Constructors & Consultants  
Houston, Texas  
**832-825-5649**  
➤ AM-FM Site Construction Specialists  
➤ Complete Tower Service  
➤ Antenna & Transmission Line Diagnostics

**EVANS ASSOCIATES** Consulting Communications Engineers  
FCC Applications • Design • Field Engineering • Tower Detuning Upgrade & Relocation Studies • AM Directional Array Tuning & Proof  
**EXPERTS IN:**  
TV • DTV Transition • FM • Directional Antennas • RF Exposure  
210 S. Main St., Thiensville, WI 53092, (262) 242-6000, FAX (262) 242-6045  
<http://www.evansassoc.com> Member AFCEE

**ERI**  
Electronics Research, Inc.  
7777 Gardner Road  
Chandler, IN 47610  
(812) 925-6000  
[www.ERInc.com](http://www.ERInc.com)

**REGISTERED PROFESSIONAL ENGINEERS**  
**STRUCTURAL ANALYSIS**  
ERI Incorporated 1943  
**TOWER REINFORCING**

**GRAHAM BROCK, INC.**  
BROADCAST TECHNICAL CONSULTANTS  
Full Service From Allocation to Operation AM/FM/TV/AUX Services:  
Field Work, Antenna and Facilities Design  
Over 35 years engineering and consulting experience  
**912-638-8028**  
**202-393-5133**  
[www.grahambrock.com](http://www.grahambrock.com)

**M Celenza**  
Communications Consultants  
FM-AM-TV-LPTV-LPFM Applications, Amendments, Upgrades, Frequency Searches, Directional Antennas Field Work (Station Inspections)  
**631-928-0077**  
**Fax: 631-928-1905**  
41 Kathleen Crescent, Coram N.Y. 11727

**dataworld**  
Market Analysis  
Engineering Software  
Ethnic/Demographic Data  
Custom Full-color Mapping  
Sales Marketing Packages  
[www.dataworld.com](http://www.dataworld.com) **800-368-5754**  
[info@dataworld.com](mailto:info@dataworld.com) fax: 301-656-5341

**MULLANEY ENGINEERING, INC.** Consulting Engineers  
• Design & Optimization of AM Directional Arrays  
• Analysis for New Allocation, Site Relocation, and Upgrades AM-FM TV LPTV Wireless Cable (MDS/MMDS/ITFS/OFS)  
• Environmental Radiation Analysis  
• Field Work  
• Expert Testimony  
9049 Shady Grove Court  
Gaithersburg, MD 20877  
Phone: (301) 921-0115  
Fax: (301) 590-9757  
email: [mullengr@aol.com](mailto:mullengr@aol.com)

**Communications Technologies, Inc.**  
Radio Frequency / Broadcast Engineering Consultants  
AM FM TV LPTV Cellular/PCS Site Analysis  
P.O. Box 1130 / Marlton, NJ 08053  
Tel: 856/985-0077  
Fax: 856/985-8124  
web: [commtechrf.com](http://commtechrf.com)  
Clarence M. Beverage  
Laura M. Mizrahi

**Doug Vernier** Telecommunication Consultants  
Broadcast Engineering Consulting AM/FM/TV/LPTV/DTV Custom mapping service Frequency searches Propagation prediction FCC application preparation  
**V-Soft** Software for your PC  
**(800) 743-3684**  
[www.v-soft.com](http://www.v-soft.com)

**R. MORGAN BURROW, P.E. & ASSOCIATES, P.C.**  
ALLOCATION STUDIES AM, FM, TV, LPTV New facilities, site relocation, FM upgrade, digital  
**FIELD WORK A SPECIALTY**  
• AM Directional antenna adjustment, measurement & proof  
• RADHAZ measurements, RADation HAZard evaluation  
• FM & TV field intensity & other measurements  
• Facility inspections for purchase/insurance purposes  
• CATV Leakage Testing  
**ELECTROACOUSTICS** OSHA measurements  
304-258-7921 Fax 304-258-7927

**SPACE IS AVAILABLE!**  
To advertise, call Simone 703-998-7600, ext. 154.

**TRANSKOM CORP.**  
Serving the Broadcast Industry Since 1978  
Fine Used AM & FM Transmitters and Also New Equipment

USED FM TRANSMITTERS		NEW TV TRANSMITTERS	
1.5kw	1987 BE FM1.5A	VHF AND UHF, 10 w TO 10kw	TV STL
2.5kw	1978 Collins 83102	TV Antennas	
3.5kw	1988 BE FM3.5A	<b>CALL US FOR A QUOTE!</b>	
5kw	1992 Harris HT3.5	<b>USED TV TRANSMITTERS</b>	
10kw	1983 Harris FM5K	1kw UHF 1992 Acrodyne	
10kw	1980 Harris FM 10K	10kw UHF 2000 Itelco T614C	
10kw	2000 Harris ZD10GD	<i>(Like new-60 hrs. of use)</i>	
20kw	1978 Collins 831G2	<b>USED MISC. EQUIPMENT</b>	
20kw	1982 Harris FM20K	Audio Amplifiers:	
20kw	2000 Harris ZD20GD	BGW 85	
25kw	1980 CSI T-25-FA (Amplifier Only)	Crown D-75	
25kw	1982 Harris FM25K	Audiometrics Stereo Distribution Amp	
30kw	1986 BE FM30A	Continental 802B Exciter	
50kw	1982 Harris Combiner w/audio exciter-transmitter switcher	Belar AMM3 Mod. Monitor	
<b>USED AM TRANSMITTERS</b>		Harris AMS-G1 AM Stereo Generator	
1kw	1982 Continental 314R-1	Inovonics AM Stereo P Audio Processor	
1kw	1987 Harris SX1A	Kintronics 50kw AM RF Switch	
5kw	1982 Harris MW5A	Polomac Phase Monitor AM1901, 2 Tower	
5/10kw	1982 Continental 316F	Sola Voltage Regulator 60Hz 1KVA	
10kw	1986 Harris MW10B		
50kw	1982 Continental 317C2		
50KW	1986 Harris MW50C3		
50kw	1986 Nautek AMPFET 50		

2655 Philmont Ave #200, Huntingdon Valley, PA 19006  
**800-441-8454 • 215-938-7304 • FAX No. 215-938-7361**  
**VISIT OUR NEW INTERNET SITE: [www.fmamtv.com](http://www.fmamtv.com)**  
**SEND YOUR E-MAIL REQUESTS TO: [transcom@fmamtv.com](mailto:transcom@fmamtv.com)**

**DISTRIBUTOR DIRECTORY**  
The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

<p><b>CORNELL-DUBILIER MICA CAPACITORS</b> FROM STOCK</p> <p><b>JENNINGS VACUUM CAPACITORS</b> FROM STOCK</p> <p><b>JENNINGS VACUUM RELAYS</b></p> <p><b>SURCOM ASSOCIATES</b> 2215 Faraday Ave., Suite A Carlsbad, California 92008 (760) 438-4420 Fax: (760) 438-4759 e-mail: <a href="mailto:link@surcom.com">link@surcom.com</a> web: <a href="http://www.surcom.com">www.surcom.com</a></p>	<p>...country, top 40, news, urban, talk, jazz, the classics, mixed bag...</p> <p><b>RADIO! The beat goes on!</b> <b>CROUSE-KIMZEY OF ANNAPOLIS</b> tops in broadcast equipment <b>1-800-955-6800</b> ask for Kathleen <a href="mailto:kkaras@proaudio.com">kkaras@proaudio.com</a></p>
--	---

**Are You a Distributor?**  
**ADVERTISE HERE!** Space is available.  
Call 703-998-7600, ext. 154.



**NEW**

**ECONCO NEW TUBES**

New tubes are now manufactured by **ECONCO** at our award winning facility in Woodland California! Of course, we continue our 34 year tradition of high quality power tube rebuilding.

TEL: 800-532-6626  
 INTL: +1-530-662-7553  
 FAX: +1-530-666-7760  
 www.econco.com  
 SE HABLE ESPAÑOL



**TUBES**  
 Want to Sell

**FOR THE BEST PRICE**  
 & 24 Hr service on transmitting tubes & sockets/parts, new & rebuilt call Goodrich Ent. at 402-493-1886 day or night, www.goodrichenterprises.com.

**RF PARTS COMPANY** • Broadcast • Industrial Communications

• EIMAC • TAYLOR • ECONCO • SVETLANA

Also  
 Motorola • Toshiba • SGE-Thomson & Mitsubishi Semiconductors

Catalog: www.rfparts.com  
 Se Habla Español • We Export

760-744-0700 • 800-737-2787  
 Fax: 760-744-1943 E-mail: rfp@rfparts.com

**BEST PRICE AND WARRANTY**  
 New USA manufactured tubes 3CX and 4CX series 3000 hr. full no hassle warranty (starts at installation)  
 800-870-9233  
 www.rjbbroadcast.com  
 (check us out, we are more than tubes!)

Buying or selling used equipment? You're in the right place!  
**Radio World**  
 Broadcast Equipment Exchange

**D And C Electronics**  
 An International Distributor of RF Components Tubes  
 NEW & REBUILT

TRANSMITTERS, STUDIO EQUIPMENT, STLS, ANTENNAS, RADIO DATA SYSTEM (FOR CAR RADIO DISPLAY) EXCITERS-TRANSMITTERS, TRANSLATORS, MIXERS-CONSOLES, RADIO LINK RPU, MOSFETS, VACUUM CAPACITORS, SOCKETS

**Eimac** **Pro-Tek**  
**SVETLANA** **EEV**

**OMB BROADCASTING USA DISTRIBUTOR**

**BEST PRICES** To Order: 1-800-881-2374 FROM OUR STOCK  
 Outside U.S. (352) 688-2374  
 Se Habla Español

3089 Deltona Blvd. Spring Hill, FL 34609 352-688-2374 Fax 352-683-9595  
 BEST SERVICE Website: www.dandcelectronics.com

**EMPLOYMENT**

**POSITIONS WANTED**

**ABS graduate** ready to spin your CDs! All types of music or talk radio. Tina, 817-913-1086.

**ABS graduate**, dedicated, creative and excited to join your team. Amanda, 405-681-2888 or ahotella79@aol.com.

**ABS graduate**, two years experience, very valuable! Write copy, production, board shifts, news and weather. Michael Lee, 405-209-5954 or evelmike2524@swbell.net.

**Friendly, eager to work**, IS CET Certified, Commercial FCC License with radar, NABER Certified two way radio technician, amateur radio extra, seeks CE, asst. CE, FT, PT, Contract, AM/FM, Cable, TV. Mitchell Rakoff, mitchellrakoff@yahoo.com. 718-969-5224. or write to: 110-64 Queens Blvd, PMB# 494, Forest Hills, NY 11375-6347.

**Full of energy**, trained and ready to experience the world of broadcasting. Call John, 405-275-4392 or 245-0866.

**Have mic, will travel.** Just graduated and ready for any challenge. Top notch production skills and excellent on-air ability. James, 405-912-7575.

**Not everyone knows his purpose** in life. I do though. I was put here to write good commercials. Rocky, 405-607-4102.

**Recent graduate** from broadcasting school. Excited to get on-air, into sales or copywriting positions. Very open to location. Humorous and willing to learn. Open to anything. Jimmy Rick, 214-316-1625.

**Recent graduate** of ABS seeking on-air positions for sports, AC or country stations. Call Ron Yoshida at 214-563-9221 or email at pnutiny426@hotmail.com. Willing to relocate.

**Sweet, energetic** personality searching for a station to call home. Very creative and reliable. Willing to relocate. Rachel, 405-990-0587.

**Unique, outgoing, creative** rookie. Ready to fill your on-air needs anywhere in the U.S. and Canada. Tara Ewell is right for you. 817-312-5761 or taraewell@aol.com.

**Voice Talent:** Los Angeles voiceover talent with years of experience. Trained at Weist-Barron-Hill in Burbank & by MG "Machinegun" Kelly. Delivery available by MP3, CD and DAT overnight. Online demos available at www.voiceoverforyou.com. Reasonable rates, rapid turnaround and custom demos available. Contact Brian Haymond through the web site or in Los Angeles at 818-400-0502.

**Want to rock your radio station?** Highly energetic young female wants to come boost your ratings! Contact Kea Kei, 469-877-9589.

**With more talents than just one.** Ready to create that vibe and quench the thirst your station is looking for to increase it's ratings. Lavoy, 405-634-0052 or 209-1392.

Buying used equipment?  
 Selling used equipment?  
**YOU'RE IN THE RIGHT PLACE!**  
**Radio World**  
 Broadcast Equipment Exchange  
 For more information, call Simone Fewell at 703-998-7600, ext. 154

**RW online**

**SPACE IS AVAILABLE!**  
 To advertise, call Simone 703-998-7600, ext. 154.

**Radio World**  
 5827 Columbia Pike, 3rd Floor Falls Church, VA 22041  
 PHONE: 703-998-7600 ■ FAX: 703-671-7409

**Classified Advertising Rates Effective January 1, 2004**

	1x	6x	13x	26x
1-9 col inch (per inch)	\$105	100	95	90
10-19 col inch (per inch)	\$90	80	70	60
Distributor Directory	\$130	125	120	115
Professional Card	\$100	95	90	85
Station/Studio Services	\$195	165	140	119
Classified Line Ad	\$2/word			
Blind Box Ad	\$15 additional			

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.  
**www.rwonline.com**

**You're Here!**

...and so are the potential buyers for your products and services.

Radio World's Classifieds section is a great place to find things for your business, and a great place for prospects to find you!

To advertise, call 703-998-7600, ext. 154 or e-mail: sfewell@imaspub.com.

# 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:

Contact Name \_\_\_\_\_  
 Title \_\_\_\_\_  
 Company/Station \_\_\_\_\_  
 Address \_\_\_\_\_  
 City/State \_\_\_\_\_  
 Zip Code \_\_\_\_\_  
 Telephone \_\_\_\_\_

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a paid basis. Line ad listings & display advertising are available on a per word or per inch basis.

WTS  WTB  Category: \_\_\_\_\_  
 Make: \_\_\_\_\_ Model: \_\_\_\_\_  
 Brief Description: \_\_\_\_\_  
 Price: \_\_\_\_\_

WTS  WTB  Category: \_\_\_\_\_  
 Make: \_\_\_\_\_ Model: \_\_\_\_\_  
 Brief Description: \_\_\_\_\_  
 Price: \_\_\_\_\_

WTS  WTB  Category: \_\_\_\_\_  
 Make: \_\_\_\_\_ Model: \_\_\_\_\_  
 Brief Description: \_\_\_\_\_  
 Price: \_\_\_\_\_

\*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

PO BOX 1214, Falls Church, VA 22041 • Tel: 703-998-7600 • Fax: 703-998-2966

# ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEB SITE URL
37	AEQ	www.aeqbroadcast.com
38	ATI	www.ataudio.com
5	Audemat-Aztec Inc.	www.audemat-aztec.com
38	Audion Labs	www.voxpro.net
20	AudioScience	www.audioscience.com
40	Autogram Corporation	www.autogramcorp.com
41	Belar	www.belar.com
38	Broadcast Devices, Inc.	www.broadcast-devices.com
23	Broadcast Electronics	www.bdcast.com
18	Broadcast Tools	www.broadcasttools.com
32	Broadcast Warehouse	www.broacastwarehouse.com
33	Broadcast Warehouse	www.broadcastwarehouse.com
24, 25	BSW	www.bswusa.com
4	Burk Technology	www.burk.com
38	Circuit Werkes	www.circuitwerkes.com
36	CKE/HVCA	www.rectifiers.com
40	Comet North America	www.cometna.com
6	Comrex	www.comrex.com
7	Comrex	www.comrex.com
1	Continental Electronics	www.contelec.com
40	Cortana	www.cortanacorporation.com
11	D&M Professional	www.d-mpro.com
38	Dayton Industrial	www.daytonindustrial.com
3	Electronics Research Inc.	www.eriinc.com
40	Gorman-Redlich Mfg. Co.	www.gorman-redlich.com
26	Grace Broadcast Sales	www.gracebroadcast.com
19	Harris	www.broadcast.harris.com
39	Henry Engineering	www.henryeng.com
17	Inovonics	www.inovon.com
16	JK Audio	www.jkaudio.com
14	Kintronic Labs	www.kintronic.com
10	Logitek	www.logitekaudio.com
38	Mooretronix	www.mooretronix.com
31	Mouser Electronics	www.mouser.com
12	Neumann/Sennheiser Electronics	www.neumannusa.com
13	Omnia, a Telos Company	www.omniaaudio.com
8	Omnirax	www.omnirax.com
27	OMT Technologies	www.imediatouch.com
22	Orban	www.orban.com
35	RF Specialties	www.rfspecialties.com
40	S.C.M.S.	www.scmsinc.com
29	Shively Labs	www.shively.com
34	Sine Systems	www.sinesystems.com
40	Star Case Mfg. Co, Inc.	www.starcase.com
9	Telos Systems	www.telos-systems.com
30	Telos Systems	www.telos-systems.com
28	TFT	www.tftinc.com
21	TransLanTech Sound, LLC	www.translantech.com
15	Ward-Beck	www.ward-beck.com
2	Wheatstone	www.wheatstone.com
47	Wheatstone	www.wheatstone.com
48	Wheatstone	www.wheatstone.com
26	www.radio-mall.com	www.radio-mall.com

## Radio World

The Newspaper for Radio Managers and Engineers

**Our readers have something to say**

*"Workbench lets us engineers share ideas that no one else appreciates. I enjoy the product reviews; and you have more classifieds and for-sale ads than anyone else. I truly look forward to receiving it in the mail."*

Aaron T. Winski  
 Chief Engineer  
 WPW Broadcasting Inc.  
 Monmouth, Ill.

## GUEST COMMENTARY

# A Modest Proposal To Improve the Show

by Neil Glassman

**T**wenty-two consecutive NABs. (What year was it the McMartin transmitter caught fire?)

For most of them, I had exhibit management duties and always focused on the radio/audio hall. Even before NAB2004 ended, I started to think about what could help make the show better in the future.

Obviously, everyone likes a crowd. If you look down an aisle on the show floor and see mostly carpet, you are less likely to stroll down that aisle. The more action, the greater the probability that exhibitors and attendees alike will return in future years — and recommend the show to others.

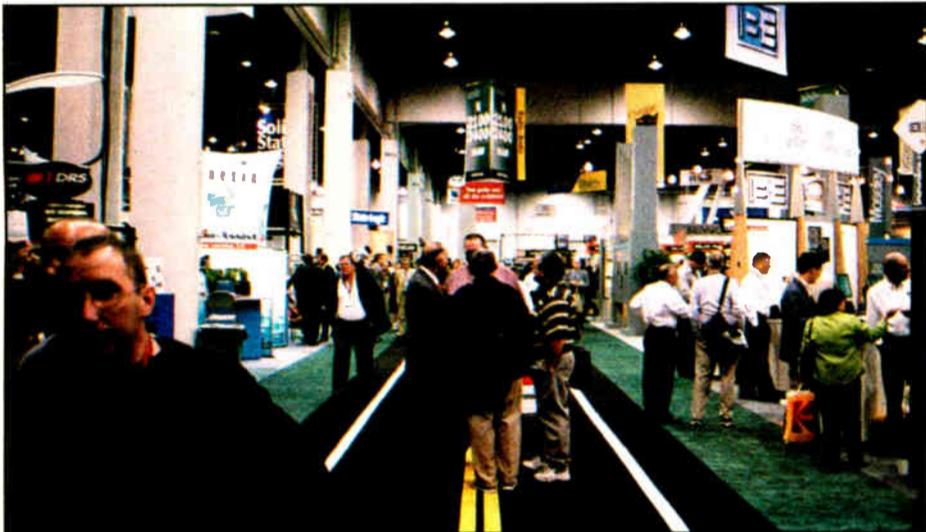
The good news this year is that crowds in the radio/audio hall were larger than 2002 and 2003. Many theories were proposed: the economy is coming back; the show is no longer split between the LVCC and the Sands; HD Radio is increasing its

When one spends most of his or her time in the radio/audio hall, the overall attendance figures are less meaningful because most attendees don't enter our galaxy. And while NAB has the tools to more accurately estimate show attendance based on lead-card swipe statistics, they continue to boast the inflated registration numbers that few hold credible.

For my first two decades of NAB, I was convinced that the radio and audio industries benefited from having a unique and mostly separate section. After all, how many video-post editors care about the latest FM exciter? And personally, I don't attend NAB to buy cameras.

But times have changed, and we must change with them.

The overall space allocation of the NAB spring show ignores the consolidation of interests at the customer and technology-provider levels. Sore feet probably conquered curiosity if one was shopping for microphones, connectors



The author wishes the North Hall 'expressway' would bring traffic to radio/audio booths — not serve as a mere shortcut to the Central Hall.

traction; stations are ready for the next-generation digital products, etc.

Whatever your favorite theory, a busier radio/audio hall is a good thing. But it was not all good news.

Look at the NAB program directory and you find that many companies involved in radio and/or audio were exhibiting in other halls. During the third and fourth exhibit days, the North radio/audio hall had far fewer attendees than other parts of the show.

and the like, which were spread all over the show. Many attendees probably missed out on many "you guys make exactly what I need" experiences because they had no reason to traverse the radio/audio hall.

And many who did pass through our territory followed the absurd "expressway" carpet that helped blind their peripheral vision as they moved from the Central Hall to the Hilton.

I am not so bold as to propose the total

## Nick Berg

We didn't know Nick Berg personally, although he sometimes worked in the Washington area. And we can only begin to imagine the horror felt by his friends and family when they learned of his death in Iraq last month.

But the cowardly execution of this 26-year-old Pennsylvanian, who made his living climbing towers, brought a distant conflict home. For some of us, the news served as a sudden and uncomfortable reminder of the chaotic, violent situation that we've come to call "Iraq" — made more real because Berg was of "our" world.

Some on the technical side of radio first learned about Berg and his disappearance through a news release distributed by his family, asking anyone with information to help if they could. Just a few days later, the world learned he was dead and the terrible details of his killing.

In a story for the Washington Post, friends recalled a high-school freshman at band camp who impishly used scraps of aluminum foil and a Walkman to build an alarm system for his cabin to startle classmates; the type of guy who "found a niche among the science kids," who enjoyed physics and could be seen cracking jokes on a home video at a science fair.

Like so many technically oriented people, he wanted to start his own company; and he did so, Prometheus Methods Tower Service Inc. Unlike most of us, he also spoke of going to Iraq, where he would fix communications towers and put American flags on top.

A colleague, Ed Bukont, told Radio World, "Nick served the needs of many stations in this area and helped establish low-power FM stations in various communities in Africa. ... A real prince, one of the nicest, decent guys you could ever meet."

A photo of Berg appeared in national newspapers showing him working at a local broadcast convention.

This was someone we could have come across at any convention, SBE meeting or tower site. A reader of Radio World would have had something to talk about with Nick Berg.

He was from "our" world.

There's no lesson to be learned from his senseless, cruel death. Just an empty sadness. Our thoughts are with his family, his business associates and his friends.

— RW

dissolution of a primarily radio/audio section of the show. The "restaurant row" concept comes into play: When there is only one restaurant, your decision is whether or not to dine out. When there are two or more, you decide where to eat. A smart exhibiting company wants to be near its competitors.

A practical redesign of the NAB show floor is required. Perhaps designate an area as "radio and audio focused" and put it in the middle of the action.

### Redirecting traffic

A simple solution would be to populate the vacant half of the North Hall adjacent to the radio/audio hall. For many companies, this area is bound to be much more interesting than the outlands at the back of the South Halls. Just one large television or video anchor exhibitor could facilitate the flow of traffic from the North Hall to other exhibit areas.

Some of us old-timers recall when the Central Hall was home to the radio exhibitors — not an unrealistic notion for the future. We radio and audio folks can certainly live without the overly wide aisles and the "filler" booths.

Does NAB really need a "Sound

Technology for Worship" pavilion three weeks after NSCA, also in Las Vegas? A "radio and audio focused" Central Hall would draw many companies whose products cross over between markets to exhibit closer to their radio and audio roots.

Whether or not you agree with the above ideas, it is apparent that the post-dot-com NAB needs to enhance the experiences of the exhibitors and attendees with an increased focus on why so many people attend: to see the new toys. There is no denying that great sessions also are a key part of the show, but what is the ratio of those on the exhibit floor to those in the meeting rooms at any given hour?

For those who have been attending and exhibiting for years, a better show is what attracts new participants. Redesigning the exhibit space to increase random traffic past the radio and audio exhibitors costs nothing, risks little and has the potential to benefit NAB and all of the audiences it seeks to serve.

Neil Glassman is managing director of Cowan Communications, advising companies in the broadcast and pro audio industries. Reach him at [nlglassman@cowan-communications.com](mailto:nlglassman@cowan-communications.com).

### —EDITORIAL STAFF—

Paul J. McLane	ext. 117	Editor
Leslie Stimson	ext. 129	News Editor/Wash. Bureau Chief
Kelly Brooks	ext. 136	Associate Editor
Thomas R. McGinley	—	Technical Adviser
Alan Peterson	—	Technical Adviser
John Bisset	—	Contributing Editor
Skip Pizzi	—	Contributing Editor
T. Carter Ross	ext. 120	Editor-in-Chief (International)
Marguerite Clark	—	Editor (International), Milan
Rogelio Ocampo	ext. 121	Latin America Editor in Chief
Karina Gerardi	ext. 137	Latin America Editor
Teresa Geary	ext. 126	Assistant Editor (International)
Terry Hanley	ext. 130	Editorial Assistant & Listings Coordinator
Peter Finch	—	Editorial Assistant, Milan

### —EDITORIAL CONTRIBUTORS—

W.C. Alexander, Bruce Bartlett, Frank Beacham, Naina N. Chernoff, Harry Cole, Troy Conner, Vince D'Ingo, Mark Durenberger, Charles Fitch, Ty Ford, Scott Fybus, Harold Hallikainen, Jeff Johnson, Craig Johnston, Paul Kaminski, Peter King, Mark Lapidus, Mark Persons, Sharon Rae Pettigrew, Michael LeClair, Carl Lindemann, Frank R. Montero, Ted Nahil, Tom Osenkowsky, Ken R., Rich Rarey, Randy Stine, Travis the VIO Guy, Barry Umansky, Tom Vernon.

## Radio World

Vol. 28, No. 12 June 2, 2004

Telephone: (703) 998-7600 • Business Fax: (703) 998-2966 • Editorial Fax: (703) 820-3245  
E-mail: [radioworld@imaspub.com](mailto:radioworld@imaspub.com) • Web site: [www.rwonline.com](http://www.rwonline.com)

### —ADVERTISING SALES REPRESENTATIVES—

US East: John Casey	330-342-8361	Fax: 330-342-8362	e-mail: <a href="mailto:jcasey@imaspub.com">jcasey@imaspub.com</a>
US West: Dale Tucker	916-721-3410	Fax: 815-352-1698	e-mail: <a href="mailto:dtucker@imaspub.com">dtucker@imaspub.com</a>
Product Showcase & Classified Ads: Simone Fewell	703-998-7600 x154	Fax: 703-671-7409	e-mail: <a href="mailto:stewell@imaspub.com">stewell@imaspub.com</a>
European Sales Mgr., Africa, Middle East: Raffaella Calabrese	+39-02-7030-0310	Fax: +39-02-7030-0211	e-mail: <a href="mailto:rcalabrese@imaspub.com">rcalabrese@imaspub.com</a>
Japan: Eiji Yoshikawa	+81-3-3327-2688	Fax: +81-3-3327-3010	e-mail: <a href="mailto:callms@msn.com">callms@msn.com</a>
Asia/Pacific: Wengong Wang	+86-755-5785161	Fax: +86-755-5785160	e-mail: <a href="mailto:wwg@imaschina.com">wwg@imaschina.com</a>
Latin America: Alan Carter	703-998-7600 x111	Fax: 703-671-7409	e-mail: <a href="mailto:acarter@imaspub.com">acarter@imaspub.com</a>

### NEXT ISSUE OF RADIO WORLD JUNE 16, 2004

For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.

### —ADMINISTRATION & PRODUCTION—

Stevan B. Dana	.....	President/CEO
Carmel King	.....	VPI/Group Publisher
Marlene Lane	.....	Editorial Director/COO
Chuck Indriedden	.....	CFO
Eric Trabb	.....	Sales & Marketing Director
John Casey	.....	Associate Publisher
Annette Linn	.....	Production Director
Melissa SE Robertson	.....	Production Publication Coordinator
Kathy Jackson	.....	Ad Traffic Manager
Milagros Castañeda	.....	Classified/Product Showcase Layout
Robert Green	.....	Circulation Manager



Radio World (ISSN: 0274-8541) is published bi-weekly by IMAS Publishing (USA), Inc., P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church VA 22041. REPRINTS: Reprints of all articles in this issue are available. Call or write Joanne Munroe, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 998-2966. Copyright 2004 by IMAS Publishing (USA), Inc. All rights reserved.

—Printed in the USA—

# D-8000

## Digital Radio Console

**ADVANCED TECHNOLOGY!** WHEATSTONE'S fourth generation digital console has what you need: dual-domain input modules that accept both analog and digital sources; built-in router integration with 8-character displays; a choice of features like auxiliary sends, equalization, dynamics control and event memory/recall—all without the aid of an external computer. The D-8000 is an all-modular design with no active components mounted inside. And best of all, it uses Wheatstone's exclusive VDIP® setup software, letting you easily configure individual console modules, logic modes and automatic functions. **Contact Wheatstone—the digital audio people!**



sales@wheatstone.com  
tel 252-638-7000

www.wheatstone.com  
copyright © 2004 by Wheatstone Corporation

# GENERATION-8: The On-Air Control Surface for High-Traffic Studios



Quality is Easy to Identify with stainless steel construction, easy servicing, and a clean yet compact layout.

## The POWER of a Network Surface with the FEEL of a Traditional Console!

ONE CAT-5 WIRE conveys all the control from this surface to Wheatstone's Bridge System. You can bring any system source (inputs or mixes) to any console fader or monitor pot (source visibility software controlled). You can set destinations for mixes, aux sends and MXMs to anywhere in your facility. For example, you could allow (or software disallow) your news console to go to your on-air chain, or feed any mix desired to a talent or remote position.

THIS MAJOR MARKET CONSOLE can handle all the call-ins and remotes you'll encounter. Four faders dedicated specifically to phone segments provide errorfree interface to four callers or remotes, each with independent caller and fader feeds, user

selectable talkback communication and adjacent channel linking. A dedicated LCD display screen keeps the operator informed and in control.

YOU CAN STORE AND NAME switch and fader settings for each operator's task and recall them by simply spinning an encoder and hitting a TAKE button. And like our larger G-9, the G-8 has 12 user programmable switches for salvos and intercoms plus additional programmable TALK buttons for IFB functions. And with full color LCD display screens the operator will know for certain that his signal is clean, his sources correct, and his preset signal is ready and waiting. *The G-8 has the layout and features to let your operators work fast and accurately!*

 **Wheatstone**

the digital audio leaders

600 Industrial Drive, New Bern, North Carolina, USA 28562  
tel 252-638-7000 / fax 252-635-4857 / sales@wheatstone.com



Made in USA

[www.wheatstone.com](http://www.wheatstone.com)

Copyright © 2004 by Wheatstone Corporation