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ON THE COVER:
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Congressman Intros Bill on Audio Broadcast Flag
New Jersey Congressman Mike Ferguson says that the Audio Broadcast Flag Licensing Act of 2006 will protect the property rights owners, but it will not interfere with the HD Radio rollout.

Nielsen Exits PPM Research Program
The TV ratings company will not participate in the deployment of the Arbitron Portable People Meter, but Arbitron sees the split as a chance to focus on its own goals and timetable.

Nautel Hires Conlon as CEO
Peter Conlon joins Nautel after many years of working in the telecommunications industry. He is the former CFO of Positron Fiber Systems.

HD Digital Radio Alliance Launches Promotional Campaign
The 12 owners that comprise the HD Digital Radio Alliance have kicked off the first phase of a promised $200 million advertising campaign to educate and motivate consumers toward adoption of HD Radio technology.

Kahn Files Suit Against Ibiquity, Others
Kahn claims that Ibiquity, Lucent Technologies, Clear Channel and others have suppressed competition and monopolized AM and FM radio. This sounds like the AM stereo battle of 20 years ago.

FCC Issues NAL Against Behringer for $1 Million
The FCC claims that its equipment authorization rules were violated when Behringer marketed at least 50 different digital audio devices.

AWRT Awards Trembly as Engineer of the Year
The award was created in a partnership with the SBE. Cristy Trembly has worked in TV for 30 years and currently works as studio manager/engineer-in-charge for CBS Television City in Los Angeles.

Site Features
Find that article
Each issue of Radio magazine is available online, and each article can be found in several different ways. Search by issue, topic, department or use the convenient search window on every page.

Do you remember?
After 13 years and more than 120 issues, Radio magazine has quite a collection of magazine covers. You can view them all online in the Cover Gallery. How many do you remember? The Gallery also recaps all the Pick Hit Award winners since 1994.

Industry Events Calendar
A list of all the conferences, conventions, seminars and other industry events is updated regularly on the Radio magazine website. Look on the lower left side of each page.
Eventide Broadcast Delays are designed to keep profanity off your air, and angry listeners, embarrassed advertisers, and the FCC off your back. We invented the obscenity delay and have a solution for stations large and small that provides up to 80 seconds of the highest quality revenue and license-protecting delay.

Our new HD compatible BD600, 24-bit delay, comes standard with AES/EBU, and provides up to 80 seconds of memory — twice as much as other delays. There are fully adjustable Delay and Dump functions, and a Sneeze function which "edits" audio entering the delay, allowing the host to sneeze, cough, or make a short comment without being heard on air.

The BD600 offers two different methods of delay buildup and reduction: Eventide's catch-up and catch-down system, and an exclusive fast-entry-and-exit feature which allows starting a broadcast with the delay already built up to a safe amount and ending it with a rapid reduction of delay.

For HD, the BD600 offers MicroPrecision Delay™ mode which allows up to 10 seconds of delay to be adjusted in real-time in 100 nanosecond increments. This is useful for synchronizing analog and digital signals while on-air, without audible artifacts, to maintain a seamless user experience.

Whatever your size, whatever your format, you can't expect to protect the integrity of your air and the foundation of your business without an Eventide Broadcast Delay in your rack.
Much ado

So the HD Radio rollout has begun. In the February Viewpoint I discussed the obvious absence of HD Radio on the convention floor of the CES convention. In January, I noted that the creation of the HD Digital Radio Alliance was a nice try, but that the effort may be too little and too late.

Then, at the beginning of February, I started seeing some consumer attention to HD Radio. I began seeing articles in newspapers and magazines around the country. The first batch touted that stations in a particular market were getting a second digital channel. The next round detailed the $200M marketing campaign that radio stations were launching (which is still funny money, but at least it's getting attention). Now, it's a mix of these topics with a little touch of terrestrial fights back satellite.

I admit that I was impressed with the new attention. Maybe this alliance effort can pull it off after all.

Unfortunately, the high feeling that HD Radio was getting some attention was lost rather quickly. On Feb. 28, I received the latest Crutchfield catalog. Crutchfield has been one of the few havens to find something about HD Radio, so I jumped right in.

The 148-page catalog is full of consumer products, and when I happened to flip it open to page 23 (the first page I saw when I opened the catalog) I saw a JVC car stereo with an LED readout that says HD RADIO. Could it be that this was the moment that so many people have dreamed about? I quickly went back to page one to see how the new-found interest in HD Radio was going to be presented.

I should have stayed on page 23. I went through the entire catalog and the only other HD Radio product I found was the Boston Acoustics Recepter Radio HD on page 142. (The BA also had the old list price of nearly of $500.)

I will give Crutchfield some credit; both receivers have a box that encourages reader to visit the company's website for more info about HD Radio.

After my initial thrill of seeing the JVC and its display, I then noticed the ironic touch that has haunted HD Radio for so long. Next to the JVC radio is a box that says "Sat Radio Ready." So much for making an impact.

In fact, nearly every car stereo in the catalog says that it is Sat Radio Ready. Going a step further, there is an eight-page section all about satellite radio that is subtitled "It's a Radio Revolution."

Satellite radio is all over the place. HD Radio got two mentions.

I realize that the alliance is just getting started on its work, so maybe the next catalog will have something more prominent on HD Radio. Maybe I'll start seeing more HD Radio mentions in the Sunday newspaper ad flyers. Maybe I'll even see portable HD Radio products that will appeal to the younger listeners. But to do this, the alliance needs to promote HD Radio outside the familiar (and no-cost) confines of unsold radio inventory.

Meanwhile, DRE and Kahn have been quiet. Maybe they're planning something big for NAB2006. We'll see soon enough.

Chriss Scherer, editor
cscherer@prismb2b.com
This Is How You Feel When You Can’t Get ISDN.

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Engineering assistance
By John Battison, P.E., technical editor, RF

When general computer usage was still in its infancy, handling data was far less easy and accurate. As time progressed, consulting engineers began to develop their own engineering programs. Some engineers would sell their computer programs, but computer-assisted engineering was not widely available in the form of companies specializing in computerized engineering programming. Most of the work was performed manually on a calculator, sometimes even on a slide rule.

One of the problems of that period was assurance that the database used was accurate. The FCC's database frequently proved to be incorrect. Unfortunately, today the same problem with the Commission's database still occurs sometimes, and the resulting accuracy of any programming always depends on accurate data. For this reason, many of the engineering programming services prefer to use their own databases.

CMBE
Specializing in radio broadcasting, CMBE audio and RF services with an emphasis on audio processing and signal coverage. Typical work involves digital and analog audio, audio production quality assurance, signal measurements and tuning, antenna systems design/troubleshooting, remote monitoring/control and signal coverage mapping.

A division of CMBE, RealCoverage.com is a Web-based mapping service that provides rapid e-mail delivery of letter-sized coverage maps and RF planning studies for any frequency from 540kHz to 100GHz including AM, FM and TV stations.

Dataworld
Dataworld's engineering services are Web-based. Customized mapping of coverage patterns for commercial, non-commercial radio and TV stations is available. Maps are based on FCC-predicted contours or Longley-Rice calculations, and provide several data layers such as boundaries, ethnic population densities and multiple demographic breakout.

FM Explorer is a what-if planning tool for FM allocation analysis. A current allocation can be viewed, and then criteria can be changed and the results can be seen in the study and on the map. FM/TV/LPTV technical engineering studies are offered on a subscription basis.

Radiosoft
Radiosoft offers several software programs and services such as Radio Compass, a browser-based mapping system. Radio Compass Online Maps create maps with FCC station data and choose map characteristics, including layers for...
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RF Engineering

detailed map features. This is suited for those who require the sophistication and complexity of a radio propagation and geospatial information system. Comstudy 2.2, offers a contour calculator, integrated 3D viewer and propagation engine, terrain-based interference analysis, shadow matrix, frequency finder online coordination tool and an optimized database engine for serving transmitter data.

RF Software
RF Software develops and markets tools for broadcast consulting engineers, and its related company, RF Engineers, offers engineering services. Services include maximum possible exposure, radio frequency radiation and field measurement services; what-if situations and similar white/gray studies; collocation and interference studies and multiple transmitter facilities studies; and propagation analyses using Longley-Rice and point-to-point methods. The company also provides one-on-one training and seminars on RF area exposure modeling and the use of advanced engineering software.

Softwright
Softwright developed the Terrain Analysis Package (TAP) for Windows. It evaluates existing or proposed transmitter sites, coverage predictions, intermodulation studies and transmitter site administration. The TAP software is written by engineers for engineers and technicians. All the equations, calculations and methodology are traceable to published documentation including IEEE published papers, technical manuals and textbooks.

V-soft Communications
V-soft Communications offers programs for AM, FM and TV. FM Commander uses the FCC database for all FM frequency searches and allocation work, and it integrates the U.S. Census, terrain elevation databases, a polygon-based USGS mapping engine, the FCC’s tower registration database, the AM database, airport and TV databases. AM-Pro performs daytime ground-wave and nighttime skywave allocation studies, AM contour mapping provides a antenna pattern editor that allows drag-and-drop editing of a directional pattern using a mouse. The company also offers a free, online AM and FM ZIP Code/signal program that will produce a table of all ZIP Codes and signal strengths within a station’s 50dBu contour.

E-mail Battison at batcom@bright.net.

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Ed Schwartz, VP, Broadcast Engineering
XM Satellite Radio

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Thomas Ray, VP, Director of Engineering
WOR, Buckley Broadcasting, New York

"See this? Genius! Genius! So, the StudioHub, is really a good thing. And it means if you've got this, you can just plug into anything. It's really incredible. So, thank you Radio Systems. Thank you StudioHub!"

Rick Adams, Director
Interactive Children's Entertainment, AOL Kids
FCC Update

FCC begins review of Katrina impact
By Harry Martin

The FCC has established an independent panel to review the impact of Hurricane Katrina on communications networks. Twenty-four members from various sectors of the telecommunications and media industries have been appointed to serve on the panel. The vice presidents of engineering from Clear Channel and Entercom have been designated to represent broadcasters on the panel. Other sectors represented are public safety organizations, wireline telecommunications providers, wireless telecommunications providers, cable providers, satellite providers, equipment providers, utilities and unlicensed telecommunications providers.

The panel has been given the tasks of 1) reviewing the impact of Hurricane Katrina on telecommunications and media infrastructure in the affected area and 2) submitting recommendations to the FCC for improving disaster preparedness, network reliability and communications among first responders. A report from the panel is due June 15, 2006.

Despite the botched governmental response before and after Katrina struck, there is a perception in many circles that the FCC's performance was praiseworthy. Press reports described Commission staffers working long hours—seven days a week, making themselves available to resolve problems, responding to requests and generally providing relief where needed. The positive PR for the agency and its staff was considerable, particularly in contrast to the unrelenting criticism to which other agencies (FEMA) were subject.

While in retrospect the FCC might be second-guessed on some aspects of its post-Katrina approach, (for example, why did the FCC insist on having licensees seek individual STAs for emergency facilities when the agency could presumably have simply granted a blanket STA to all licensees in the storm-affected areas) the overall take-home message has been that the FCC went beyond the call of duty in facilitating emergency communications to Katrina-ravaged areas.

Presumably with that positive image in mind, the Commission is seeking to reconfirm its role as an effective force for good. The panel is seeking input from all interested members of the public. Written statements may be submitted at any time. In addition, short oral presentations from the public were solicited for the panel's next meeting.

The panel convened its inaugural meeting in Washington in January, but it plans to hold its next meeting in Jackson, MS, on March 6. Requests to make oral presentations were invited by public notice that was issued in February. It is not clear whether there will be additional opportunities to make direct, oral presentations to the panel at the March 6 meeting, but presumably such opportunities will arise in connection with future meetings.

Written and oral presentations to the panel during the March 6 meeting are to focus on 1) the impact of Hurricane Katrina on telecommunications and media infrastructure and public safety communications, 2) the sufficiency and effectiveness of the recovery effort with respect to this infrastructure and 3) ways to improve disaster preparedness, network reliability and communications among first responders.

Panel meetings are open to the public and may also be viewed on the FCC's website.

Renewal cycle ends

The renewal cycle for radio stations, LPFMs and FM translators which began on June 1, 2003, with the filing of renewals for stations in DC, Maryland, Virginia and West Virginia, ended on April 1 with the filing of renewals for stations in Delaware and Pennsylvania. Radio station license renewals are now issued for eight years. Thus, radio stations whose renewals were filed on April 1 will, in most cases, be granted for a term ending Aug. 1, 2014. The next radio renewal cycle will begin June 1, 2011, for stations in DC, Maryland, Virginia and West Virginia.

Martin is immediate past president of the Federal Communications Bar Association and a member of Fletcher, Heald & Hildreth, Arlington, VA. E-mail martin@fhlaw.com.

Dateline:

Radio stations in Michigan and Ohio must file biennial ownership reports on or before June 1, 2006.

June 1 also is the deadline for radio stations in Arizona, DC, Idaho, Maryland, Michigan, New Mexico, Nevada, Ohio, Utah, Virginia, West Virginia and Wyoming to place their annual EEO reports in their public files and post them on their websites.
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Welcome to the Radio magazine NAB2006 preview. The NAB convention is the largest broadcasting event of the year, and this year's convention is expected to be another record-attendance event. Digital technologies are maturing, radio ad sales continue to show increases and consumer interest in media is as high as it has ever been. The discussions on the convention floor will likely cover the various forms of digital terrestrial radio and its associated technology.

Our convention preview provides many elements to help you prepare for the show. This issue of Radio magazine is packed with useful information to help you navigate the floor. The exhibit hall is the center of activity and overflows with new product introductions. Look for many of the new products in the NAB Extra!

The FASTtrack—a Radio magazine exclusive—organizes the exhibitors into product categories, and then sorts them according to booth number. This is done so that you can plot the shortest course—the fastest track—between exhibitors showing the products you seek.

The convention floor covers a lot of space, and most of the radio-specific exhibits are in the North Hall. Our pull-out map will help you find your way.

When you need a break from the exhibit halls, take in a session. The session timetable outlines all the events of the Broadcast Engineering Conference and more.

And be sure to take the FASTtrack with you on your PDA. Download the Radio magazine FASTtrack, Exhibitor Directory and BEC Session Guide to your Palm or Pocket PC today. The files are on the Radio magazine website. Look for the FASTtrack for PDA link.

See you in Las Vegas.

Chriss Scherer, editor
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Get a preview of some of the most innovative products debuting at NAB2006 with the NAB Extra! This section provides access to products long before you get to the show, so you can plan which booths to visit. With booth numbers included, the NAB Extra! will help you find exactly what you are looking for.

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Booth numbers from the NAB are current as of March 15.
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— Thomas R. Ray III, CPBE, Vice President / Corporate Director of Engineering, Buckley Radio

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— Ethan Torrey, Chief of Research & Development, Minnesota Public Radio

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— Jorge Garza, Chief Engineer, Univision Radio, McAllen, Texas

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— Rudy Agus, Chief Engineer, Hi-Favor Broadcasting, Los Angeles, California

"The announcers tell us how much they love working with the Axia consoles... It's great to be able to setup and save multiple configurations that can be recalled at a moment's notice. I don't know why we hadn't gone this route earlier. Where we're installing new equipment, we're onboard with Axia."

— Owen Martin, Director of Engineering, Newcap Radio, Alberta, Canada

"The jocks took to the new Axia consoles like fish to water. Show Profiles are their favorite part, because they can all have custom board set-ups. Since the first studio was installed, we've added a new production and interview studio, and we plan on building three more studios. It'll be all Axia, all the way to the transmitter."

— Marc Johnson, Chief Engineer, WEGL-FM, Auburn University, Auburn, Alabama

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25kW transmitter

Broadcast Electronics
Booth N1808
4MX 25: Based on patent-pending 4MX medium-wave digital transmission technology, which is a method of modulating the duty cycle of the radio frequency directly to produce a more linear output waveform, the 25kW transmitter is DRM-compatible and capable of linear audio reproduction. The transmitter comes with a separate audio input to pass the full frequency range possible of digital transmission. The modulation scheme uses a breakthrough technique to apply a signal to all PA modules in parallel. This design maintains audio quality and efficiency during full power daytime and reduced power nighttime modes.
217-224-9600; fax 217-224-9607
www.bdcast.com; bdcast@bdcast.com

Podcast module
Prophet Systems Innovations
Booths N3522, C4431
XLR8R: With this system, users can create and post podcasts 10 times faster than conventional means. The Nexgen podcast module is user friendly and is integrated into the workflow at a radio station. The module helps users to craft compelling, original and experimental programming.
877-774-1010; fax 308-284-4181
www.prophetsys.com; sales@prophetsys.com

Digital recorder
Marantz
Booth N600
PMD560: Offering more than 35 hours of recording time on a 1GB CF memory card, this compact rack-mount digital recorder is a solid-state recorder with recording to Compact Flash media cards or Microdrives. Uncompressed WAV files can be recorded at 44.1kHz or 48kHz, and MP3 files can be recorded in mono (at 64kb/s) or in stereo (at 128kb/s). Using a standard 1GB Compact Flash card, the unit can record more than 1.5 hours of stereo and more than three hours of mono uncompressed audio, more than 17 hours of stereo MP3 and more than 35 hours of mono MP3 audio. The recorder features RCA input and output jacks, two remote jacks as well as an RS-232C connection port. The front panel offers a headphone jack with volume level and a built-in USB interface.
830-741-0330; fax 830-741-0652
www.d-mpro.com; info@d-mpro.com
IP codec
Prosys
Booth N4519

Prontonet: The Prontonet is a multiformat audio codec with capabilities such as dual codec (two independent encoders and decoders) supporting G711, G722, MPEG1/2 Layer II, MPEG1/2 Layer III, MPEG2/4 AAC LC and MPEG4 LD as well as APT-x among its standard coding algorithms and bi-directional uncompressed linear audio transmission over IP through its Ethernet 10/100 port. The Prontonet can also establish a back-up link using ISDN at 64kb/s or 128kb/s under communication loss of X21 or IP links.
973-559-0555; fax 973-559-9555
www.ataaudio.com; sales@ataudio.com

Audio logger
Energy-Onix
Booth N3335

Documentor: This audio logger permits a station to select previous programs by the minute, hour, day and month. The unit can drive 10 terminals simultaneously via LAN or Internet connections.
888-324-6649; fax 518-758-1476
www.energy-onix.com; energy-onix@energy-onix.com

Automation, scheduling, management system
Enco Systems
Booths N617, C2507F

Streamline: Enco partnered with Wicks Broadcast Solutions and Powergold to create Streamline, an integrated automation, music scheduling and traffic system. Streamline integrates DAD’s library/playlist functions with VisualTraffic spot entry/log management and Powergold music scheduling/analysis, simplifying a workflow. The system runs on standard PCs with Windows 2000 or Windows XP Pro operating systems.
800-362-6797; fax 248-827-4441; www.enco.com; sales@enco.com

Audio converter
Symetrix
Booth N2414

Lucid 88192: This audio converter supports eight channels of A/D/D/A conversion at sampling frequencies up to 192kHz. The multi-format unit offers simultaneous connectivity for analog, AES/EBU digital audio and SMUX2 ADAT optical digital audio. An option port is included for future adoption of additional formats.
425-787-3222; fax 425-787-3211
www.symetrixaudio.com; symetrix@symetrixaudio.com

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Digital telephone hybrid
Sonifex
Booth N4507

DHY-03: This DSP-based digital telephone hybrid is a redesign of the DHY-02 and offers 75dB typical line balance rejection. The hybrid's feature-set includes universal line compatibility, input and output gain adjustment, input and output metering, conferencing, RS-232 serial control, local and remote line hold switching, integrated auto-answer, automatic call disconnection, auto-duking, DTMF tone recognition, a balanced mic/line input and balanced line output.

207-173-2424; fax 207-773-2422
www.independentaudio.com; info@independentaudio.com

Translator remote control
Crown Broadcast
Booth N3912

Airsis TM2000:
This system offers full command and control of the translator and transmitter fleet via the Internet. No phone lines or satellite dishes are required—just a whip antenna. The system comes standard with a two-way RS-232 data port for connection to a satellite receiver, tower light controller or other on-site equipment. Data retrieved can be e-mailed or displayed on the AirsisVision website. Log on to the AirsisVision secure website to calibrate, monitor and control the translator. The online database stores translator readings and other site information providing logs.
800-262-8919
www.crownbroadcast.com; fmsales@irec1.com

Enclosure
APW Mayville
Booth SL2132

Stantron Broadcast Rack: Available in a variety of heights and depths, this rack offers a low profile with a powder coat finish. Horizontal lacing brackets simplify the management of cables by spreading them from front to back. The integrator can tie cables in strategic areas to accommodate a narrower space. Thin profile powerstrips provide space savings in high-density wiring applications. Top and rear mountable fan panels assist airflow through the rack system and keep terminal gear within its proper operating temperature range.
800-558-1291; fax 920-387-7196
www.stantronracks.com

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info@logitekaudio.com

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Three-phase UPS
Staco Energy Products
Booth C107

Firstline UPS: This online, double-conversion UPS provides computer-grade power with a standard battery run-time of more than eight minutes. A user-friendly control panel located on the front of the freestanding NEMA 1 enclosure includes an alarm and remote monitoring through an RS-232 connection. Firstline models are available for 10, 15 and 20kVA applications with input voltage of 208, 220 and 480Vac and a range of +10/-20 percent (166 to 229Vac). Input frequency is 60Hz ±5 percent. Full load walk-in from 25 percent to 100 percent of rated load in 10 seconds. Inverter output distortion is equal to five percent THD for non-linear loads and equal to two percent THD for linear loads. Output voltage is regulated to ±1 percent of nominal at full load.

Exciter
Harris
Booth N1522,
C807, SU2929

Flexstar HDX-FM: This exciter provides real-time adaptive correction technology, which offers noise reduction and transmitter and antenna linearity to provide a clear, crisp signal to the end user's receiver. The unit also features adaptive group delay equalization; secondary auto-switching of AES-3 and composite inputs; and hybrid/straight FM outputs for the split-level combining method, which enables a power-efficient implementation of FM HD Radio using a station's existing FM transmitter and antenna and offers a 10 percent reduction in operational costs over high-level combining.

TCP/IP codec
Audio Processing Technology
Booth N1217

Worldnet Chicago Lite: The Worldnet Chicago Lite features Enhanced APT-x to provide a low-delay audio path via IP for AM, FM, DAB and HD Radio. It is scalable in bandwidth, with contact and optocouple closures for remote status and alarms. The unit occupies 1RU. A GUI is provided to adjust all parameters.

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John Sebastian, PD
WJMK-FM, Chicago
CBS Radio
Audio processor, controller
Junger Audio Studiotechnik
Booth N3200

Level Magic, Level Magic Surround: Level Magic uses an adaptive level control algorithm to equalize audio levels from any source at any time. The range incorporates automated gain control, plus transient processing and peak limiting for continuous unattended control of any program material. Level Magic Surround is designed to support eight-channel audio processing.

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For a FREE Digital Studio Cable Guide or a FREE cable sample, call: Belden CDT Electronics Division 1-888-BELDEN-4 Or, go to Belden's Web site at: www.belden.com/radio

G37: These 12-channel DT12 connectors feature an anodized aluminum backshell that locks in place with two set-screws into a series of castellations. The set screws and castellation prevent accidental loosening of the connector shell thereby extending the operating life. The male connector shell is constructed from stainless steel to prevent damage and wear. The crack-proof neoprene insulator features a bonded and scalloped design that prevents rotation. The pins and sockets feature a three-micron, mil-spec gold plating for improved solder and tarnish resistance. For strain relief, the connectors feature an oversized nut and rubber gland seal with an optional keelam cord grip and heat shrink.

800-966-0069; fax 847-796-8770
www.gepco.com; gepco@gepco.com

Rubi-T: This mini Rubicon broadcast console is 6" high and features any number of input modules, monitor modules and talkback modules. This console is useful for news booths, edit booths, voice booths, voice tracking and mini secondary effects mixer in on-air studios. Features include full-length 100mm P&G fader and four programmable source select or bus assignment buttons.

818-840-6748; fax 818-840-6751
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- The parametric EQ takes care of any frequency anomalies with surgical precision.
- Post-processing insert point, -10dBV and +4dBu analog outputs, 24/96 digital outputs on AES3, S/PDIF and Optical, word clock I/O, and a cough switch with soft mute allow the Model 230 to be easily interfaced into any system.

So if you are looking to touch your listeners, you should be looking at the Aphex Model 230.

www.aphex.com

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Illustration by Jesse Caswell. Aural Exciter, Big Bottoms, EasyRider, RPA, and Logic Assisted Gate are trademarks of Aphex Systems.
DJ headphones

Denon Electronics
Booth N600

DN-HP1000: Using a closed-back design for isolation, these headphones employ a large speaker driver (53mm) and feature rich bass with a frequency response from 5kHz to 33kHz. The headphones' soft padded ear cups swivel 180°. They use a folding design, dual nickel-plated adapter (1/4" and 1/8") and semi-coiled soft insulated cord with reinforced cable strain.

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STL
Broadcast Electronics

Big Pipe LT: This series offers a data capacity starting at 10Mb/s for transporting AES and analog audio as well as multiple channels of HD Radio audio and data. This version has been optimized for point-to-point connectivity between a studio and a transmitter site. It is capable of transporting main channel audio at 32kHz, 44.1kHz or 48kHz sampling rate, plus several channels of HD Radio coded audio for HD2 Multicasting, as well as channels of advanced data services while still providing Ethernet connectivity and RS232 serial data to the studio or remote site.

217-224-9600; fax 217-224-9807
www.bdcast.com; bdcast@bdcast.com

Low-power FM transmitter

Harris

ZX: Based on Harris' Z-Series of transmitters, the ZX low-power transmitter is available in 500W, 1,000W and 2,000W power levels for analog broadcasting. Upgrades to HD Radio are achieved when driven by the Flexstar HDX-FM exciter, as a hybrid analog/digital system or in digital-only mode.

800-822-0022; fax 513-459-3890
www.broadcast.harris.com; broadcast@harris.com

PAD management system

Enco Systems

Padapult: This system enables real-time manual sending of data to HD Radio, RDS, websites (up to six locations) from a control room, while also integrating data output from the automation system or satellite provider. A stand-alone application, it can be used with any radio automation system. There's also a text stream embedded in the carrier wave. Text scrolls across the front of the receiver's LCD panel.

800-362-6797; fax 248-827-4441
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34 March 2006

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From the beginning, ERI has been a leader in the research and development of IBOC FM technologies. Join us as we continue to work toward developing new products for this exciting technology.

**LYNX™ Dual Input Side Mount FM Antenna for IBOC Operations**

The Electronics Research LYNX™ Dual Input Side Mount FM Antenna is designed specifically for FM IBOC applications. This new antenna is capable of transmitting both the analog and digital FM signals without requiring a high loss hybrid combiner and maintains high isolation between the digital and analog transmitters. The design meets the current Federal Communications Commission requirement for informal notification of IBOC implementation.

**MASK-960 IBOC Spectral Compliance Filter**

ERI has developed a compact arrangement of our famous FM 970 band pass filter cavities to address the specific needs of FM IBOC broadcasting. ERI's mask filter configuration can provide the right response for any requirement.

**iBOX™ Low/Medium/ High Power Hybrid Combiners**

The quality and reliability of ERI's standard quarter wave hybrids have been adapted for use as an IBOC Hybrid Combiner. The iBOX™ 10 dB Hybrid Combiner is available in two versions:

- Low/medium power version for analog FM power levels up to 30 kW
- High power version which is rated to handle up to 80 kW of analog FM power.
Digital audio software programs
Netia Digital Audio
Booth N3208

Radio Assist 7.5 Modules: The short message service module for the Radio-Assist 7.5 range of digital audio software programs uses mobile phone platforms as a new way to communicate interactively, allowing on-air talent to play interactive SMS and voting games with listeners. The Air-DDO module is spread over two monitor screens. The GUI simultaneously displays four broadcast channels and offers access to help and preparation tools, including a cue, on-air monitoring, playlist modification, recording and production. The statistics tool allows users to measure and monitor the effectiveness of various elements of their daily broadcasts, including the number of times an audio clip has been played. This new tool automatically displays results per day/month or the user's period of choice. Multitrack XT is an editing tool for multitrack digital audio recording and editing. It offers time stretching, pitch shifting, noise reduction, noise gating, synchronization, stereo and multitrack broadcasting, support for CD audio engraving programs and import/export MP3 files.

866-638-4222; fax 973-575-7812
www.netia.net; j.martin@netia.net

Manifold combiner
Dielectric
Booth C2020

DFM series: The unit is similar in appearance to a traditional branch-style combiner, but the output manifold, which is comprised of one coaxial line, has a separate tee junction for each input frequency and a short circuit stub on the end farthest from the output. As with all combiners, each input to the manifold combiner requires a band-pass filter tuned for the input frequency. This filter rejects all other frequencies in the manifold.

800-341-9678; fax 207-655-7120; www.dielectric.com; dcsales@dielectric.com

Mixing console
Audioarts Engineering
Booth N1815

D-75N: This digital audio mixing console can be modified with the Net-75 panel to provide a fully integrated network system with the option of autonomous console operation when needed. Four output buses along with eight digital inputs and outputs are provided within each panel. Six faders within the D-75N provide access to thousands of analog and digital system resources. Input modules are equipped with eight character LED displays, rotary source selectors and take buttons.

252-638-7000; fax 252-635-48547; www.wheatstone.com; sales@wheatstone.com

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888-665-0501; fax 204-783-5805
www.ami.net; amt@ami.net

All-hazards digital alert system
Global Security Systems
Booth N4208
GSSNet: This alert and notification system uses the existing nationwide FM broadcast infrastructure to provide messaging coverage and a proprietary messaging system that allows secured and encrypted data with layered and targeted messaging to personnel. Command and control centers are installed with full redundancy. Messages are transmitted from an FM radio tower to multiple receivers in the coverage area. Fixed-wireless substation receivers and wireless receivers are made available to be distributed to all counties and other jurisdictions throughout the state as defined by the authorities.

www.gssnetlu; info@gssnetlu

AES/EBU surround format
D.A.V.I.D.
Booth N3034
RF-64: D.A.V.I.D. has implemented the newly standardized RF-64 surround sound format. In cooperation with broadcasters, the IRT and EBU staff, D.A.V.I.D. engineers developed this new specification. It is available as an upgrade to all customers. The file format is designed to meet the requirements for multichannel sound in broadcasting and audio archiving. It is based on the Microsoft RIFF/WAV format and WAV Format Extensible for multichannel parameters. Additions are made to the basic specification to allow for more than 4GB file sizes when needed. The format is transparent to the BWF and all its chunks.

888-374-3040; www.latitude-edition.com; info@digasystem.com

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Booths SL3732, SL186-MR

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800-833-6687; fax 408-537-6000; www.adobe.com

Signal processor
Vorsis
Booth N1815

AP-1000: This multiband, dual path FM plus HD processor features an interactive user interface that provides remote monitoring and control. The unit simultaneously provides outputs to FM or AM transmitter and HD Radio signal chain. Other features include multi-band processing, embedded graphic control, Ethernet interface, front panel USB ports and remote monitoring using interactive GUI software.

252-638-7000; fax 252-635-4857; www.vorsis.com; sales@vorsis.com

Telephone hybrid remote interface
JK Audio
Booth N4215

RIU-IP: This remote control interface for the company's Innkeeper 2 and Innkeeper 4 digital hybrids contains a Web server that allows the user to send and receive control data through his Web browser. The unit features an RJ-45 Ethernet port along with several remote control capabilities such as indication of incoming rings per line; the phone line can be taken off-hook or on-hook; users can set it for auto-answer and ring count; start and stop conference (Innkeeper 2); and adjustment of transmission and receive level per line. The unit always provides test tone start and stop per line and address book upload and download. RS-232 remote control port uses ASCII protocol and no external power is required.

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Booth N4215

RIU-IP: This remote control interface for the company's Innkeeper 2 and Innkeeper 4 digital hybrids contains a Web server that allows the user to send and receive control data through his Web browser. The unit features an RJ-45 Ethernet port along with several remote control capabilities such as indication of incoming rings per line; the phone line can be taken off-hook or on-hook; users can set it for auto-answer and ring count; start and stop conference (Innkeeper 2); and adjustment of transmission and receive level per line. The unit always provides test tone start and stop per line and address book upload and download. RS-232 remote control port uses ASCII protocol and no external power is required.

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N - North Hall
C - Central Hall
SU - South Hall upper level
SL - South Hall lower level
OE - Outdoor exhibits between the Central and South Halls
R - RTNDA exhibits in the Hilton
Lobby - Booths in the lobby areas. The lower booth numbers are in front of Banners restaurant outside the North Hall. The higher booth numbers, such as the SBE in Lobby 28, are near the Broadcast Engineering Conference session rooms 5220 through 5227.

Once you have identified the hall where a booth is located, you then have to navigate the floor to find it. In general, the booth number follows a grid. The first digits represent an aisle (or column), the last two digits represent a row. In the North Hall, this is easy to follow. When you stand at the hall entrance near Banners Restaurant, N400 is in the front to the right and N4538 is in the back and to the left.

The Central Hall is also simple. The aisles start from the front. When standing at the entrance with the bus loading area behind you, C101 is in the front on the left, C11547 is in the back on the right.

The South Halls can be confusing because the grid system is divided into the front and rear portions of the halls. Standing at the entrance with the Monorail behind you, the lower aisle numbers are on the left and they increase as you move right. The confusing part is that the odd-numbered aisles are toward the front and even-numbered aisles are in the back. Both levels are split at about the midway point.

While it seems that SU107 should be across the aisle from SU207, it is not. SU107 would be across the aisle from SU307. SU207 is halfway back and on the left across the aisle from SU407.

Note: the booth numbers provided are for illustrative use only and may not be actual booth numbers.

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Top technology highlights technical sessions

The Broadcast Engineering Conference is packed with presentations about radio technology. Now in its 60th year, the technical sessions cover all aspects of radio broadcasting, but this year's topics lean toward issues covering RF and HD Radio.

The sessions begin on Sunday, April 22, with the SBE Ennes Workshop. This year's topic of "Everything RF" jumps right into the RF theme of the conference. The workshop divides the time between radio and TV topics, so unless your interest covers both, you'll be able to take a break from the day-long session.

The Broadcast Engineering Conference opening keynote address will be delivered on Sunday, April 23, in room S219/220. This year's keynote will be delivered by Tomlinson Holman, a professor of cinema-television and electrical engineering at the University of Southern California, and an innovator in audio technology. His address will discuss consumer expectations of high-quality audio and video and how broadcasters can best compete with this demand.

The Radio Luncheon will be held on Tuesday, April 25, in the Hilton Barron room. A ticket is required to attend. During the lunch, Dick Purtan of the WOMC Detroit morning show will be inducted into the NAB Broadcasting Hall of Fame, and Walt Mossberg, technology columnist for The Wall Street Journal, will deliver the keynote address. The NAB Crystal Radio Awards will also be presented during the luncheon.

On Wednesday, April 26, the Technology Luncheon will feature a keynote address from Chris Anderson, the editor-in-chief of Wired magazine. During the luncheon, the NAB's Television Engineering Achievement Award winner, S. Merrill Weiss, and the Radio Engineering Achievement Award winners, Benjamin Dawson and Ronald Rackley, will be honored. A ticket is required to attend the luncheon.

The annual Amateur Radio Reception will be held on Wednesday, April 26, at 6 p.m. This popular event draws a large crowd every year, and the event sponsors provide many door prizes.

The schedule grid on the next page shows the session timetable.

The breakdown of all the papers is available in the Radio magazine FASTtrack, Exhibit Directory and Broadcast Engineering Conference Guide for the PDA, which can be downloaded from the Radio magazine website at beradio.com. In addition, some key elements of interest to Radio magazine readers from other conferences have been included in the session timetable.
"It just made sense using the CAT-5 scenario to go with StudioHub and use it throughout the plant. It allows us to reconfigure things on the fly faster and a lot easier than ever before."

"A lot of people questioned me when I first suggested using a CAT-5 wiring system and now they all look at it and see how really convenient it is. This really works well. We've been very pleased."

"As with any new installation, we've had to make changes and reroute signals. Rewiring was a laborious task and on a punch block. You start moving wires and after a while things get very disorganized. But with StudioHub, it's very easy to reconfigure something. We can easily move stuff around without ever having to pull out punch block wiring charts."

"There's no punch tools needed. If you have to move something around, it is very easy just to--it's like unplugging a telephone cable--you just unplug it from one jack and plug it into another jack. Things are labeled well. It's a very flexible system."
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<td>9:00</td>
<td>LI/NSSE Workshop: Everything RF</td>
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<td>Connecting with the Consumers</td>
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<tr>
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</tbody>
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**Location:**
- Hilton Ballroom A
- Hilton Ballroom B
- Hilton Barron
The NAB Engineering Achievement Awards
Dawson and Rackley are co-recipients for radio

Two leaders in AM radio technology will be honored during the Engineering Luncheon at NAB2006. The 2006 Radio Engineering Achievement Award winners, Benjamin Dawson and Ronald Rackley, are known for their work in AM transmission systems around the world.

The NAB Engineering Achievement Awards were first established in 1959. They recognize individuals for their significant contributions that have advanced broadcast engineering.

Benjamin Dawson, the managing partner of Seattle-based Hatfield and Dawson Consulting Engineers, has practiced as a telecommunications consulting engineer for the last 30 years. He has designed, implemented and refurbished medium-wave antenna systems with as many as 10 towers at power levels as high as 2MW. Dawson began his career while still in junior high school. He is a Registered Professional Engineer (Electrical) in Washington and California. He is a member of the Association of Federal Communications Consulting Engineers, the Institute of Electrical and Electronic Engineers and the Society of American Military Engineers.

Ronald Rackley is partner in the engineering firm of du Treil, Lundin and Rackley in 1983. Rackley is a member of the Association of Federal Communications Consulting Engineers, where he has served as president. He also served as vice president of the Broadcast Technology Society of the Institute of Electrical and Electronic Engineers. He was a consultant to USA Digital Radio during its early years of digital radio development, and has recently been called on to assist numerous client stations in evaluating and improving their AM antenna systems for HD Radio. Rackley is a registered professional engineer.

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www.beradio.com Radio magazine March 2006 63
The heart of the audio system has some new tricks

We live in an era of rapidly progressing technology. I was reminded of this when I began preparing this article. Three years ago I wrote a similar article, so I decided to look back and see how much has changed. I was surprised how much progress has been made in such a short period of time.

While analog audio consoles are still alive and well, many major audio console manufacturers no longer feature analog consoles at the top of their product lines. The analog boards that are available still range from the simple to the complex, but they are no longer the stars of the show. Stations with one control room or modest means can still use the analog consoles, but the possibilities offered by digital make it attractive to stations that want to build an integrated audio system.

Going digital

Digital consoles now cover the full range from economical to complete audio control systems. Several manufacturers now offer digital consoles in a small package. Some of these consoles are digital realizations of simple analog consoles, but others are feature-laden consoles in stand-alone packages, designed for the small station that wants an all-digital air chain. In many cases the digital consoles are comparably priced to similar analog consoles. Some of the stand-alone consoles can be added to larger systems in the future with little modification.

Many digital consoles have a great deal more flexibility than their analog cousins. Depending on the design of the console, you may have a lot more inputs and outputs than you may think necessary. The beauty of the digital console is that virtually any output can be used for any function. Depending on the console, you may be able to have multiple outputs follow a given front panel control, thus creating mix-minus or other special functions. Some even provide a group of user-assignable buttons with macro programmability, so you can perform a series of functions with the press of one button.

As the digital consoles become larger and more complex, they typically become part of a total system that includes a digital router and multiple consoles or control surfaces. Again, manufacturers have chosen slightly different paths to achieve the same ends. Some
have chosen to create a router and include all the console functions in the router under software control. They then have one or more control surfaces that connect to the router to create a complete audio system. Others have chosen to include the typical functions of the console in the console, and then connect the console (one or more) to a router with fully integrated control in the console. To the end user, the results are the same: a fully integrated audio system. However, installation and maintenance are a bit different.

Some digital consoles, like analog consoles, only provide the basics of console operation: audio level control, on/off switching, bus assignment. Others provide additional functions commonly found only in high-end analog consoles, like equalization, dynamics processing (compressor/limiter) and the ability to have multiple setups of the console. Almost all have some measure of automation interface. The ability to easily interface the consoles with automation systems makes them attractive to stations that are modernizing from older analog consoles.

The routers used with these systems are not your father’s routers. Previous generations of routers (mostly analog) simply routed the audio from one input to one or more outputs. Most were contained in a single chassis or modular chassis system, but needed to be in close proximity to unify the operation. The current digital routers may or may not include A/D converters on the inputs, but all provide some means of redlocking or synchronizing the digital signals coming in to them. This is necessary to prevent glitches when switching or mixing the signals. They are distributed systems, with a central unit (usually placed in a rack room or other location where audio signals enter and leave the facility). Smaller units can be placed in control rooms as needed to deal with local sources within that room, such as a CD player). The various units are connected by optical fiber or other means of data networking. The control surfaces connect to the nearest router chassis, but can control any source or destination in the system (depending on software rules set up by the system administrator). This type of system minimizes the amount of room-to-room wiring and greatly simplifies the total system. Again, depending on the design of the system, the router may contain all the control functions for the audio (level, routing and more) or some of these functions may...
A new level of control

be located within the console itself.
In addition to the basic function of routing audio, the current digital routers can also route control signals. A couple of the control signals that can be routed are muting and machine control, such as start and stop. The flexibility of the router/control surface combination adds even more utility. You can set up multiple mix-minuses, route IFB signals for remotes and studios, and even provide full intercom functionality. The uses are limited only by your imagination.

With all this flexibility there are some advantages that may not be readily apparent. For instance, you may be able to reduce the number of control channels on the control surface from what you would have in a simpler system. Any given control channel on the console can be connected to any source, and all functions will follow with that assignment. For instance, a channel that is used for a local announce mic during a morning drive (live operation) can be the voice track channel later in the day when the station is automated. Most of the control surfaces provide dynamic labeling so operators can tell at a glance what source the channel is connected to. By the way, most systems will not allow a channel that is switched on to be reassigned until it is turned off.

Most of the systems allow you to set up scenes or presets for the control surface. They may have different names, but the idea is the same. You can save one or more setups of the console (sources, gain, mix-minuses, IFB, control, even equalization and dynamics control) for the entire control surface and then recall this setup with a simple action. For instance, if you have a busy morning program with lots of call-ins, you can set up several faders as phone interface inputs, complete with mix-minuses. Then, later in the day, when you have a slower pace with lots of music and no call-ins you can replace the phone interface inputs with music sources, such as CD players or a hard drive playback system. The shift change can be as simple as a push of a button. While the closing theme of the morning program is playing, change the setup and as soon as the theme is finished, that channel will also switch to the new setup.

Built-in backup

Another advantage is the ability to back up the primary control room. Because the control surface can control any signal in the system, any control surface can become your on-air control room. This can be a big plus for times when work needs to be done in the normal air control room or even if the control surface (or its connection to the rest of the system) fails. Again, depending on the system, this function can be password protected or possibly even remotely activated via a computer. While you probably don’t want this to be a function that anyone can access without thinking (a single button press), you can build it in and control who can access it. When you change control surfaces to another room, any control or auxiliary audio signals (IFB for instance) normally associated with a given source will stay with the channel.

Most manufacturers offer more than one series of control surfaces.
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A new level of control

Some offer meters on the control surface, conventional analog meters or, more commonly, digital bar graph meters. Others offer metering as part of a full range of display options to connect any VGA monitor. As with analog consoles, the features and options on different control surfaces will appeal to different people. This is not a reflection of the quality of the control surface, just how well it meets a particular need.

Once the decision to install a digital router/console system is made, do your homework. Start by determining the specific needs. How many inputs and outputs are needed for the system? Be sure to include intercom, monitor (including headphones) and control functions. Identify which sources are mono and which are stereo. Break the needs down by location. A spreadsheet may be helpful to collect and organize all of this information.

As you look at systems, ask lots of questions. Does the system have the flexibility you need? How about redundancy or fallback in case of equipment failure? What about redundant power supplies? How easy is the initial setup of the system? How much setup does the manufacturer provide on purchase? Get a user list from the manufacturer. Call people on the list and ask their experience. Find out their opinion of the system and the service after the sale. Find out if they know anyone else with this manufacturer’s systems and contact them, especially if they are not on the user list. Remember that no one is perfect. No matter how good the manufacturer is, if you dig deep enough you will find bad things about it. Take the comments with a grain of salt, and weigh them carefully.

Once you have limited your choices, present the manufacturer with your needs. The company will work with you to configure a system. Once you have a system configured you can begin to work on a price. If you find that you can’t manage the budget for the entire system at one time, consider a staged installation where you start with one room, and add as money is available. This not only helps distribute the cost, but can help you budget your time for installation. It would also allow you to get a room operational for training before your operators have to deal with the system on air.

While these systems are right at home in a cluster of stations, don’t overlook the possibility of using them in smaller situations. A simple station with a control room, production room and newsroom may find the advantages of a digital system to be well worth the cost.

Carter is chief engineer of WFMT Chicago.
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(Left) WGY-AM has the largest of the seven on-air studios. This is WGY's talk studio. The main host position is on the left.

(Right) The WGY-AM control room. All seven on-air studios are similar in size, and all use Harris Smoothline custom studio furniture, and Harris RMX Digital on-air consoles.
Consolidation continues to happen on many levels throughout the broadcasting industry. The big trend in consolidation going back five to 10 years had to do with ownership of stations. While this continues to a degree, the trends over the last five years have shifted toward facility consolidation.

Clear Channel Albany owns seven regional radio stations: five FMs (WPYX-FM, WHRL-FM, WKKF-FM, WRVE-FM and WTRY-FM) and two AMs (WGY-AM and WOFX-AM). The station group recently relocated to a new facility in Latham, NY, bringing all seven stations under the same roof with the idea that merging all technical and business elements results in a smoother, more efficient operation for the entire group.

Clear Channel Albany previously operated two studio facilities about nine miles apart: our main office in Albany and a second, satellite operation in Niskayuna, NY. Our engineering staff, comprised of two full-time engineers, a part-time contractor and me, often found itself spread thin. When simultaneous technical issues occurred at both sites, we would have to decide which was more serious and leave one station’s technical issue hanging until the other could be resolved.

The radio industry’s multi-station acquisition phase meant that station groups were frequently acquiring operational facilities. In many cases, this meant dealing with different engineering standards. Wiring and infrastructure differences were especially notable in our case, because one facility used 66 blocks and a massive amount of bridging, while the other facility was designed around AMP Taper technology and distribution amplifiers.
The consolidation to the Latham site gave our group the ability to start fresh from an engineering standpoint. The property had previously housed an HMO firm. Clear Channel cut a deal with the new landlord for about 27,000 square feet, signing a 10-year lease. Design firm Luckett and Farley, often used by Clear Channel, immediately went to work by gutting the entire infrastructure. Although technically a refit of an old building, everything inside is new construction. All that remained were floors, outside walls and the roof. In some instances the floors were disposed of and taken right to the dirt. The facility was rebuilt from the shell that remained.

**Plans in motion**

The main goal of the consolidated facility was to group the operations. The larger of the two older facilities had an undesirable layout, with studios spread throughout. The main terminal equipment room was designed around a two-station operation. Clear Channel Albany started with an AM and FM and subsequently added many more signals. Everything became crowded as a result. The new facility was planned to ensure we didn’t run out of space before the 10-year lease expired.

The facility is soundly built and designed. Protection was a central theme of the initial design. We opted for facility-wide UPS protection because a large portion of our operation is computer-based. All mission-critical technical facilities, including the on-air and production studios, are powered by a UPS. In the event of a power failure, the UPS batteries seamlessly carry the load until our generator starts, keeping us on the air.

An APC Infrastruxure system was purchased on Luckett and Farley’s recommendation. This is a rack-mountable UPS design as opposed to the typical large lunchbox-style case traditionally placed on the floor. The downside with this system is that I had to give up two full racks to make room for the UPS system. In return, this puts the UPS directly in our climate-controlled terminal equipment room where we maintain the 69° or 70° temperature at all times. With four separate HVAC systems we have redundancy in case one system fails. Additionally, the remaining racks are powered by smart ac strips that report back to the UPS on the current draw and the load in each rack. This information is networked, and available off site via the Web. The positive aspects outweigh the negatives.

**A better layout**

The facility layout, as previously mentioned, is far more appealing than our previous facilities. Visitors entering the front door immediately walk into a spacious lobby. A conference room behind the lobby overlooks the Mohawk River and doubles as a performance studio. This space is usually reserved for large meetings, but is also wired for microphones and monitors. A small, attached control room with a Soundcraft LX711 mixer is used to produce live performances for in-house or on-air broadcasts. Many of these performances will be advertised as listener-appreciation events, where a listener audience can attend and watch the performance.

The remainder of the facility is divided into two wings, both secured by electronic locks that require a key pass for entry. The right half of the building is largely sales, traffic and administration. The consolidation of our sales and management team was essential for a smoother business operation.

The left half of the building is devoted to technical operations: engineering, production, on-air studios and air staff office space. At the center of the technical corridor is our terminal equipment area. The approximately 1,100-square-foot space features three distinct WRVE-FM's on-air studio. The co-host sits at the right circular portion, with Production 1 visible through the window.

Station visitors can view the outer terminal equipment rack room through a window. The entire rack room is 1,100 square feet and is compartmentalized into three distinct areas.

All seven production studios feature three microphones for one operator and two guests. Production 5 is centered around a Mackie D8B mixer.
rows of equipment racks (standard Middle Atlantic 32" and 36" deep racks with front and rear rails, and Chatsworth open relay racks). The two outside rows, which house typical broadcast equipment, each feature 12 racks of equipment in a back-to-back positioning. A central row of the Chatsworth communication racks divides the space and is the wiring backbone for the facility.

The first rack row is positioned four feet from the hallway and situated behind a glass wall, with the second rack row about eight feet behind it. Operators have access to these front racks adjustment on-air processing and related equipment. The racks are compartmentalized and feature predominantly Moseley and Harris digital and analog STL equipment, Starguide satellite receivers, specialty receivers, ISDN and POTS codecs and telco equipment. Several of the racks are devoted to the individual stations, and are home to various Omnia and Orban on-air and off-air "confidence" processors and a variety of analog, HD Radio and multi-function modulation monitors. Several other racks are home to the facility’s Prophet Systems Nexgen system, associated servers and archival systems, as well as our business servers.

The technical heart of the facility is a Harris Vistamax networked audio and routing system. Built to 384x256 and centralized in the terminal equipment area, Vistamax is integrated into its own rack and is wired to the central facility communication racks. Inputs and outputs for all the radio stations go through Vistamax, providing the ability to share sources between all on-air and production studios and other technical and non-technical areas. Vistamax distributes audio throughout the facility, including programs fed from the satellite receivers and other on-site and off-site sources. The Vistamax also eliminates numerous distribution amplifiers and patch bays, as well as the traditional toggle, rotary and push button switches often found mounted in panels. This reduces the complexity of signal routing and systems integration for a multi-signal facility.

The center row of racks, off limits to operations, contains the bulk of the house wiring, including communication blocks, cross-connect wiring, studio wiring, telephones and networking, as well as the Vistamax fan-out, for the entire facility. We use Krone blocks, which are far more flexible than the AMP Taper pins or 66 blocks used in the past. The Krone blocks feature a connection that is considerably more positive than the older 66 blocks, though the downside is that there are fewer connections available per block. The Vistamax system eliminates most of the issues related to having fewer connections. Another positive factor is the Krone’s built-in test port. Signals can be interrupted or bridged into and out of the blocks as necessary. Signals can be monitored, measured and inserted, and the Krone cross-connect blocks can be used as a miniature patch system if desired.

The seven on-air studios are similar in size, all featuring Harris Smoothline custom studio furniture, and nearly identical Harris RMX Digital on-air consoles. Talk station WGY-AM is the largest, with a control room, talk studio and news booth comprising the station’s on-air headquarters. A Harris Impulse digital console in the news booth ties to the Vistamax with external hardware connections. The signals are routed to the Vistamax mainframe in the rack room and back to the Harris RMX Digital on-air console in WGY’s main control room.

The WGY talk studio features basic furniture, microphones and a small turret for the host to control the monitors and headphones. Live talk programming for the station originates from this studio, with room for the host and several guests, and is routed directly to the on-air studio.

Source equipment is generally the same for each on-air studio. A complement of Sony Mini Disc players and recorders, various CD players and recorders, and even a few cassette machines are integrated into studio cabinetry. On-air hosts and guests use the recorders for personal archiving; Clear Channel also uses the recorders for occasional archival purposes. Other sources arriving through the Vistamax and assigned to the on-air console include TV audio, telephone/ISDN equipment, satellite equipment and all other production and on-air studios.

WOFX-AM, our sports talk station, is a slightly scaled down version of WGY, with a separate control room and talk studio but no news booth. This station was largely automated in the old facility because there was no room for a separate talk studio. With the additional room, WOFX continues to add live programming, making the talk studio an important piece of the station’s on-air operation.

The five FM stations are all similar, with predominantly single control arrangements for music. WPYX-FM, a classic rock station with a lively morning show, is the only noticeably larger studio. This studio offers enough room for six guests, with additional standing room when necessary.

Prophet Systems Nexgen hard disk system is central to the entire on-air operation. The Nexgen is used for the majority of on-air programming, with CD players and cassette machines serving as backup, or used for the occasional piece that isn’t ingested into the Nexgen. The daily log dictates much of the Nexgen’s ingest and playout schedule.

**Equipment List**

- **Alesis RA-150**
- **APC Infrastuxure UPS**
- **Behringer UB2222FX, UB1204PRO, MX2004A**
- **Belden wire and cable**
- **Chatsworth racks**
- **Comrex Hotline, Matrix**
- **Crown D-75**
- **DBX-186**
- **Electro-Voice RE-20**
- **Gepco wire and cable**
- **Harris Smoothline**
- **Harris Vistamax, RMX Digital, Airwave Digital, Impulse**
- **Krone blocks**
- **Mackie VLZ-Pro, D88**
- **Middle Atlantic racks**
- **Moseley Lanlink**
- **Omnia 6EX, FM, IR**
- **Orban Optimod 8500, 6200, 9200**
- **Prophet Systems Nexgen**
- **Shure SM-7**
- **Sony MDS-E12, MDS-JE410, MDS-JE 510**
- **Soundcraft LX7II**
- **Symetrix 528E**
- **Tannoy Reveal**
- **Telos Zephyr, Xport, Xstream**
- **Telisine Commander, I-Mix**

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A conference room behind the lobby doubles as a performance studio. This space is wired for microphones and monitors, and features a small control room with a Soundcraft LX7II mixer for production of live, on-air performances.

The WHRL-FM air studio.

and the system works from there, interrupted only for live programming. As a result, our AM stations rely on the Nexgen less. However, all on-air studios have functioning Nexgen-enabled workstations. The Nexgen naturally ties into an archival Dell server with about 600GB of storage that typically stores cuts, spots and promos for as long as 30 days. Pre-recorded long-form programming, including programs received via satellite, are also stored in this server.

The seven production studios are also similar in design and layout. We used some of Harris' Smoothline furniture here also. It's always been my preference to duplicate the equipment and layout of studios within a facility to reduce the learning curve for operators who move from studio to studio. Having a similar complement of equipment in each studio also reduces the engineering complexity, as familiarity sets in.

Five production rooms (Production rooms one, two, three, four and seven) feature Harris Airwave Digital consoles with Vistamax outputs to contribute to and take sources from the system. Production rooms five and six feature Mackie mixers. All seven of these consoles are repurposed from the old facilities as they continue to serve us well. The basic production room also features three microphones for one operator and two guests, and sport Electro-Voice RE-20 or Shure SM-7 mics. CD players, DVD Players and Mini Disc players are also included, with recorders to come in the near future. All production rooms are Nexgen-capable, featuring three playback channels. Various editing systems are also used for production purposes.

Two additional facility features round out the technical area. A six-workstation newsroom is central to the operation of the stations. Each workstation features a Mackie 14-channel VLZ-Pro mixer and Vistamax connection to deliver audio to various studios for live news updates. The option to go live from any or all of the newsroom workstations is also available through the Vistamax system.

Our division of CCTN, the Clear Channel Traffic Network, also operates out of our facility. Local traffic conditions are gathered and broadcast over our seven stations, as well as one of our local TV stations, with expansions slated to cover other markets in the Northeast from our facility. Here, three CCTN studios feature eight-input Behringer mixers, the Prophet system and a wide variety of communication equipment. The mixers are primarily designed for voice, with ISDN and Vistamax capability for connection to each on-air studio.

Clear Channel Albany operates seven transmitter sites, one for each station, ranging from distances of one mile to 17 miles (most are in the eight mile to 10 mile range). Our STLs are evolving as a result of our HD Radio initiative. WGY and three FM stations (WPX-FM, WHRL-FM and WTRY-FM) are currently broadcasting in HD Radio. Analog/composite STLs are being phased out and replaced with digital STL systems that offer higher fidelity audio. Moseley Lanlink systems, while not yet operating, are in place so we can further improve communication with our transmission facilities.

We currently use T1 lines and fixed 950MHz STL systems to transport audio. We are also combining T1s and 950MHz STLs on a single path in some situations where audio for HD Radio and analog stations are sent to the transmitter sites. Clear Channel Albany is awaiting final local approval for an STL tower. Our current location in the Mohawk River Valley means we are working over challenging STL paths and difficult terrain. The T1 circuits have come in handy for now, because we can transport program audio to our current towers and use those sites as relays.

Clear Channel Albany is currently in fine working operation at the Latham location, with close to 10 years on the lease and room for expansion. Future challenges include the advent of multicasting, which will double the amount of program signals on our FM stations. This could mean converting some production rooms to on-air studios for supplementary HD Radio program services. The Harris/Vistamax system can easily accommodate these signals with the addition of more accessories. In the meantime, the launch of this facility affords us an enormous amount of flexibility for on-air operations, as well as engineering and business-oriented actions that were simply not available when we were spread across two facilities.

Abdoo is director of engineering, Clear Channel Albany.
Facility Focus
the technology behind Clear Channel Albany

Prophet Systems Nexgen
Prophet Systems is a complete digital technology company specializing in broadcast automation management and control. NexGen Digital provides hardware and software configurations scalable to any size station. Clear Channel, Albany has integrated this technology to suit its facility. NexGen complements the high-energy site with reliability and efficiency. System management is worry-free with minimal time spent configuring and maintaining the network. Features in NexGen include WANcastng, which allows stations to share resources, Digital Reel-to-Reel, which allows time shift recording of up to four programs simultaneously on one computer, and CDX/AFC, which is the most powerful and full-featured CD Ripper and Automatic Format Converter available.

www.prophehtsys.com
877-774-1047

Comrex Matrix
The Comrex Matrix offers the ultimate in flexibility for remote broadcasts. Whether on regular telephone (POTS) service, ISDN lines or GSM wireless networks, the Matrix can send high-quality remote audio to the studio from virtually anywhere. As a 15kHz POTS codec, the Matrix can connect to all with Comrex POTS codecs, and with the optional ISDN module, it is compatible with most ISDN standards. When the remote site has no phone line, the optional GSM module allows the Matrix to transmit 7kHz audio with an internal GSM wireless phone. Along with the full line of Comrex codecs and telephone hybrids, the Matrix will help your station broadcast great-sounding audio from anywhere.

www.comrex.com
800-237-1776

Telos Zephyr Xstream
The Zephyr Xstream family includes the rackmount-style unit, the portable MXP, and the rackmount MX. The rack-mount version features analog and AES/EBU inputs and outputs with independent sample-rate converters. All the units feature multiple coding algorithms, including G.722, G.711 and MPEG Layer3 and Layer2, MPEG-2 AAC, and MPEG-4 AAC-LD, a built-in ISDN terminal adapter, a 10Base-T Ethernet port for remote control and streaming of MP3-coded audio, and an auto-configuring 90 to 240V power supply. An optional V.35/X.21 interface is available. The portable MXP adds a digital four-channel stereo mixer. The MX is a rackmount version of the MXP. The MXP and MX also adds selectable AGC/limiter processing presets by Omnia, built-in 48V phantom power for two mic inputs, and two separate local headphone mixes to monitor send or receive audio, or both.

www.telos-systems.com
216-241-7225

Harris PR&E RMXdigital
The latest generation of the Vistamax network-enabled radio broadcast consoles, the RMXdigital is a cost-effective, compact design built upon the philosophy and value of its big brother, the BMXdigital. While the RMXdigital is an excellent choice for stand-alone console applications, the built-in Vistamax audio/logic router allows users to take advantage of networked power on their own time frame. The Vistamax network shares audio resources across the facility without the need for time-consuming and costly wiring. The RMXdigital provides flexible operation and a quick, simple and cost-effective installation. The all-digital design offers four program buses with digital and analog outputs; one send bus with digital and analog outputs; up to four simultaneous telco/codec inputs with automatic on-line/off-line switching; 44.1kHz or 48kHz sampling rate; and console session setup with preset recall.

www.broadcast.harris.com
800-622-0022

ADVERTISEMENT
Technology advances in the studio can be great. They help make our lives easier and improve the quality of the programming product that we broadcast. New products are becoming smaller, more powerful and easier to use. Unfortunately, these same advances tend to spoil us, as we always want more. This was the case recently in the news department of WDBO in Orlando. These reporters are not only some of the best journalists in the business, but are also adventurous enough to want to try the latest tools of the trade. Fortunately, they also have the ability pick up something new and learn to use it fast. It's this talent level that helped WDBO take home the station of the year award for 2005. It's also this talent level that demands the best.

Recently, the news department needed some new field recorders. They have been using Minidisc for some time, and also have a couple of flash card recorders. They also typically carry a laptop with them to edit their stories and send the files back to the newsroom. What they asked for this time was a recorder that's more reliable than their mini-disc recorders, and smaller than the flash card recorders that they were using. The kicker was that they also wanted something that would allow them to do some basic cut-and-paste editing on the recorder like they can do on their laptop computers.

**In your pocket**

In my search I came across the AEQ DR-100 digital field recorder, a *Radio* magazine 2005 Pick Hit Award winner. The first thing that impressed me was the size of the device. It's about the size and weight of a small cell phone, yet it is packed with features. The recorder is menu-driven using the navigation buttons and a 1.5" built-in LCD display. It comes with built-in flash memory capable of recording 4.5 hours of stereo audio, but it accepts external flash memory cards for even more recording time and flexibility.

The DR-100 comes complete with everything you need to get started including the rechargeable battery and power adapter, an internal and an external microphone, audio cable, headphones, belt case, USB cable and software for the PC. It even features a built-in FM tuner to monitor the station.

I was a bit concerned at first when I saw that the recorder was menu-operated, but after only a few minutes with it in my hands I was recording, editing and transferring files with no trouble. The menus are clear and easy to navigate, yet for those more technically challenged, the basics like record and play are easily found. I was also impressed by all the information shown on the screen in record mode. The LCD display clearly shows the record format mode (MP2, MP3 or G.723), sample and bit rates, input level meters and input source. It displays timers showing the length of the recording, plus how much time is remaining on the memory card so you don't get caught short. There's even a small frequency spectrum meter shown. All of these are on the display at the same time so there's no fumbling through menus to find the needed status information.

Recording is easy and flexible. The digital recorder comes with a built-in microphone, which I found to provide good quality. It also comes with a small external plug-in mic, or you can use your own microphone for the best quality interviews. There is also a line input and output to record from media distribution boxes or other audio devices. The system can also record directly from its built-in FM tuner, or can input MP3 files from a PC. There are three recording modes, MP2, MP3 and G.723. The MP2 mode is the primary suggested mode of operation because it opens other features. Two sample rates can be chosen in this mode (32kHz and 48kHz) as well as several bit rates ranging from 112 to 384kb/s in the stereo mode, or 32 to 192kb/s in the mono recording mode. The built-in waveform editor is...
only available for MP2 files. The unit also offers the option to set recording levels or take advantage of the built-in AGC. Record options include instant start, start on first audio or delayed recording via the built-in timer. While recording, the user can push a button to place a mark making it easy to find desired material later.

**Outstanding editing**

While the recording features are nice, it’s what you can do afterward that really makes the recorder shine. Once audio files have been recorded, you can open them in the Sound Editor mode and view the waveform on the display. Again, I was impressed with how easy it was to begin cut-and-paste editing. Within minutes of playing with the machine, I was already making edits and cleaning a file. This display may be small (1.5”), but the waveform fills the screen with a resolution that makes editing clear and easy. As with most editors, simply mark the start and stop points on the waveform. You can create rough edit points then go back and adjust if needed. You can even zoom in on the waveform display for precise editing. After the audio section is highlighted, you can listen to what’s inside or outside of the selected area to hear how edits will sound. Next, you can choose to delete the section or save it as a new file. All editing is non-destructive, so you can go back and recover the original recording at a later time. To provide even more flexibility, you can merge other audio files into your edit decision list (EDL). This allows field reporters to record a news report and edit in their actualities on the spot. Finished audio files can then be downloaded to a PC to be e-mailed back to the newsroom. The system even has the ability to connect to a modem if you want to transfer the file via a telephone line.

**In the field**

Our reporters have been using the recorder in the field now for several weeks successfully. The one issue that I have heard some negative feedback on is with the battery. What makes this unit so small and lightweight is its cell phone-like design. It even uses a battery typically found in a cell phone. A full charge can provide about three hours of recording, editing and playback time, but when it goes dead, that’s it. Find an electrical outlet to recharge it. Some of our other recorders use standard AA or AAA batteries, which the reporter can carry in the car or even purchase at any store. I suggest purchasing a spare battery with the unit and keeping it charged. I also suggest alternating the batteries to keep them fresh and active. One other feature that I personally would have liked to see is a built-in speaker. Nothing fancy, but just something that you could use to verify the recording. The DR-100 comes with headphones, but a speaker would be a nice addition.

The editing features go well beyond other recorders in this class, allowing our reporters to edit stories in the field without the use of their laptop. AEQ definitely deserves its Pick Hit Award for the DR-100 professional digital recorder, and from my understanding, the company has yet another model about to be released that will allow editing in some of the other recording formats as well.

Fluker is director of engineering for Cox Radio, Orlando, FL.

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**AEQ**

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**Editor's note:** Field Reports are an exclusive Radio magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company. These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of Radio magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by Radio magazine.
Field Report

Wit Easi-8
by Jeffrey Zimmer

When putting together a remote control system, we are inevitably confronted by the differing control and monitoring needs of each piece of equipment within a station. The main transmitter may require a momentary closure to ground, whereas the auxiliary requires latching a voltage. The Common Point sample exceeds the input level of the remote control during the day but not at night. When all is said and done, many of us find ourselves with a combination of relay interfaces, voltage dividers, operational amplifiers and a variety of other extras required to properly interface the remote control system, filling up rack space and adding additional problems and maintenance concerns. The need to issue alarms for time dependent systems, such as tower light monitoring and day/night common point readings, and the desire to avoid persistent alarms for momentary excursions from the norm, such as silence sensing, just add to the problems.

Rick Prime, technical director for Family Stations, recently sent me the Easi-8 remote control unit developed by Wit. At first glance, I noticed the size and simplicity of the unit. At 3" x 8" x 6" the unit is small—small enough that two can be mounted side-by-side in a 19" rack. The package contains a panel for mounting the system in a rack, and a dual panel is available. Mounting brackets are also included for wall mounting the unit. The front panel contains a series of LEDs and looks like a large network router. The rear panel offers 18 Phoenix plug receptacles and an RJ-45 jack. The unit is a network-based remote control system with flexibility in the metering inputs, control outputs, limit monitoring and logging.

Metering and control

Each input channel uses a fully balanced difference amplifier requiring no reference to ground. Input voltages can be ac or dc of either polarity, with a range from zero to 160V.

Relay contacts on the control outputs are rated for 2A at 24Vdc, 50W max switched load, or 1A at 120Vac, 120VA max switched resistive load. Each relay output can be configured with isolated set and clear closures, or configured as a full Form C with the typical NO-C-NC connections.

Now it gets really good. Plug it into a computer network, point a browser to it and now you have a wide range of programming and configuration options.

Each metering input can be calibrated by entering offset and multiplier values. Or, it can be calibrated by connecting the sample, entering what the meter should display and the values are calculated for you. Setting alarm conditions is one of the real shining points of this unit. Four limit values can be established for each input. Separate actions can be taken for each limit, as well as separate actions taken as the value goes above or below the limit. The actions taken consist of logging, e-mailing, executing a relay closure or nothing. A time delay can be applied to that limit so that an alarm condition exists only if the limit is exceeded for a specified period of time.

Tower light monitoring provides a good example. By feeding the output of my ac tower light current sample into the unit, I can set a low limit to log the time when the lights turn on and off. I set another limit to send a notification if one sidelight is out, a third limit to send a notification if the beacon is not blinking, and a fourth limit to send a notification if the beacon is stuck in the on position. All these limits can have time conditions applied to them so it won't trigger an alarm in the daytime. A similar approach could be used for different day and night common point values and tower parameters.

The default display provides all the channels for a single unit on one browser page. When using multiple units, the screens for each unit can be displayed by clicking
through the Windows task bar. Alternately, specific pages may be defined by pulling readings from any input of any unit within the network. I have three pages setup: one displays transmitter, tower lights and general info, a second displays the day antenna values and day common point, and the third displays night antenna values and night common point. The metering display provides numerical and graphical representations of the metering input. On a 17" LCD monitor, I could easily watch all of the tower values at once, from across the room, while making phasor adjustments.

Network-based communications provide a variety of configuration options. A unit can be plugged into a cable or DSL network with a static IP, and monitoring can be done from anywhere with Internet access. Prior to obtaining a high-speed connection, I connected mine to a network with a Windows XP machine acting as a host for Windows Remote Desktop. I could then dial in and view the system. This is slow but sufficient.

**All the extras**

Included with each unit are a rack panel, wall brackets, a prewired temperature sensor ready for use, power supply, Phoenix plugs for the input and output connections, a direct and a crossover Ethernet cable, a little greenie screwdriver, installation manual and a current version of Java on CD. The installation manual provides the basic features of the Easi-8 to help you get started. Actually, a quick read-through was all it took. Much of the setup was done intuitively. However, if needed, a more detailed manual is provided on the included CD.

I've always felt that consistent logging of readings, particularly at a directional AM, was one of the best diagnostic tools I have to intercept problems in the antenna system. A slow drift over time or rapid changes in the first few minutes of energizing an ATU can aid in diagnosing a failing capacitor or other problems. The logging functions of the Easi-8 are versatile. The unit can be programmed to e-mail a log that consists of a snapshot of readings. The frequency of e-mails can range from once every second to once a day or less. It could also be programmed to e-mail only on an alarm. As an aside, during testing, it takes about 1.5 seconds to send the e-mail so you only get about 40 messages in a minute if it's set to log every second.

While on the subject of diagnostic tools, I believe this unit would be a useful addition to the toolbox. The small, lightweight box can easily be deployed at any location to log power line fluctuations, control timing or anything else that can be monitored via a voltage or contact closure.

Technical support and development are intertwined with Wit. Minor bugs in the system were identified and solved. Suggestions made were considered and in some cases implemented. In fact, if I do have a complaint, it is that the documentation lags behind the constant improvements and features being added. However, this is a minor complaint because I am pleased with the initial features and any questions are only a phone call away.

Versatility, size and simplicity are the most desirable factors in this device. Wit has determined what the real-world concerns are for the station engineer and have produced a product that addresses those concerns aggressively and effectively. Zimmer is assistant technical director of KECR, Lakeside, CA.
Maximized effort

As I speak with listeners and read posts at online forums, one recurring theme I see is "it's the content, stupid" or something similar. People say that radio is stale, not innovative or the formats are too narrow or limited. Satellite radio, which unlike free radio is controlled 100 percent by only two companies, on the other hand, lauded as a remedy for these maladies.

So why can't the hundreds of free, over-the-air broadcasters provide a challenge to the two national satellite companies? One of the primary reasons has always been the competitive nature of our business and pursuit of maximum audience and profits.

Because each terrestrial radio broadcaster only has a few "channels" (independent radio stations) available in any given market (the FCC maximum is eight in even the largest markets), no single broadcaster can provide a variety of programming similar to what the two satellite providers, with their 100+ channels each, can provide. And because there are so many competing terrestrial broadcasters in each market, out of financial necessity we tend to compete over the most popular or lucrative formats.

The result of this is that we don't have a variety of programming choices in each market equal to the number of stations in that market. Listeners may have a number of country stations, a number of top-40, hip-hop and rock stations, etc., but more eclectic, adventurous, innovative or niche formats are few and far between.

The objective of the HD Digital Radio Alliance is to learn from history and work cooperatively to address programming diversity and meet the listeners' needs before everyone is on the air with the new digital signals and this becomes a big business, as traditional analog radio has become time over time. The alliance isn't just for or about the large broadcast groups: a number of smaller broadcasters have joined up, and the alliance encourages all radio broadcasters, large and small, to come together and be a part of this effort to establish a new radio service for the listening public. This plan really can't provide maximum variety to the consumers unless all the broadcasters in a market, large and small, participate.

Our studies of the number of radio signals providing reliable coverage of each market have demonstrated that it will take all of the broadcasters in each market cooperating to provide the variety of program content that satellite can provide. The innovative concept of the alliance is simply about deciding on programming in a market first, and working together, to guarantee that no two secondary digital channels in a market duplicate the same programming, and that maximum programming innovation, diversity and choice is available to the listeners. So we'll have a free radio service that is equivalent or superior in depth, variety and diversity to satellite.

What this is all about is saving free radio. Listeners will be able to get digital clarity, with variety on a par with what the satellite services can provide, for free. We can do this with the new digital channels since they don't already have an entrenched listener base and established revenue stream that we're depending on to keep the lights burning. As with FM radio back when AM was king and FM was a novelty, we can afford to do something new and different on these new channels. So why even consider programming each of those channels via the same competitive paradigm as we've traditionally done with the analog stations, we simply won't achieve the worthy and important goal of programming diversity.

As many have already correctly pointed out, if there isn't something unique, better and different provided by digital radio it's going to be difficult to persuade any significant number of consumers to invest in the hardware. The HD Alliance is all about creating something unique, better, different—and free!

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To me that doesn't make a lot of sense. It's a little like the classic definition of insanity: doing the same thing over and over again, but expecting a different result.

Is this concept guaranteed to work? No. But I believe it's the right thing to do at this critical time.

It's been said of the alliance that large broadcasters such as Clear Channel aren't, or can't be, in touch with their listeners, and thus can't know what to program to meet the needs of the local markets they serve. This simply represents a misunderstanding about how Clear Channel programs our radio stations. Clear Channel as a company doesn't
program the local stations: our local program directors do. Clear Channel Radio owns or programs roughly 1,200 radio stations in the United States. This amounts to about nine percent of all U.S. radio stations (which contrary to what some of our detractors may say, is far from any sort of monopoly by any definition). Those 1,200 stations are programmed by 900 local program directors. Those local program directors live and work in their local markets and know their listeners personally. Just because their paychecks say Clear Channel and they happen to work for a company that owns a large number of stations doesn’t make them any less locally connected or committed.

I love the radio business and am passionate about it, and I am optimistic that these second audio channels will give us all a chance to provide a new, relevant, meaningful service to the listening public, for free, without disrupting a service and business model that still attracts millions of listeners (and dollars) daily and provides many of us with our income. Until we had the second digital channels we were trapped in a Catch-22: we couldn’t afford to change (too much revenue riding on the status-quo) but we couldn’t afford not to (lest we get left behind as people adopt satellite radio, cell-phone entertainment, Internet radio and iPods).

We stand today at a pivotal crossroads in the evolution of our industry. My hope is that you and the leaders at your stations and companies will join us in reinventing our business to maintain our vibrancy and relevance into the 21st century.

Steve Davis
senior vice president, engineering
Clear Channel Radio
Tulsa, OK

But it is the content
Chriss,
You were right on target once again in the January edition of Radio magazine. Someone has really dropped the ball in the HD Radio receiver manufacturing segment. No one I know in the specialty radio vendor business can recall the last ad or informational article pertaining to HD Radio receivers, let alone as to why their customers ought to begin to think about buying one (a digital HD receiver). I see very few ads for HD Radio and even less explanations as to what it is and why I should look into one.

I read a lot of articles as to broadcasters change over to HD Radio, but little as to how it will affect me, the listener! The consumer market has a long way to go to even begin to understand this new technology and how it will benefit them. The average person on the street has no idea about HD Radio and that is going to really hurt initial sales. The new HD Radio receivers are just going to appear to be just a plain old expensive radio to the consumer and the consequences of that are really going to be felt. Start-up sales will be so slow and hard that some manufacturers are going to take fatal hits.

Keep up the drum roll. Someone may wake up. I hope it’s not too late.

John Wagner
Ohio

Find the mic winner
January issue
Congratulations to
Duane Pavlicek
of DP Engineering, Colorado Springs, CO.
His name was drawn from the correct entries for the January issue. He won the Heil Sound PR-20 from Transaudio Group.

The mic icon was next on the right leg of the tower even with the center of the moon.

www.transaudiogroup.com

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Reader Feedback

in the February issue. It is content, not fidelity, that makes a station successful. Please, learn that mantra and say it 10 times a day...please.

These fools in the driver seats of radio have all missed the point. See the mantra above. Technology is not going to make a station succeed—content does. That's why creaky, ancient modulation, known as AM, is still a top vote-getter in our cities. It's the "content of modulation" or quality of program presented that gets the listeners, not the latest transmission gimmick.

OK, hoping I've made my point, extend that to "HD Radio will be a wasteful experiment of desperation." Satellite is growing by leaps and bounds and the only salvation for terrestrial is to "identify with your local population." That's it.

Larry Tighe
WRNJ-AM
Owner
Hackettstown, NJ

Customer dissatisfaction

Chriss:

As a broadcaster I appreciate great audio but just as important, I appreciate great audio at home as well. In this case it's from the position of a consumer that I'm writing to you because you seem to share my zeal for the rollout of HD Radio.

For a few years now my wife and I have wanted to redecorate our living room but haven't been able to afford this project until now. Included in that plan has been the addition of a new audio system. The one that has caught our ears and eyes is the Bose 3-2-1 virtual surround system.

Even though I tend to be a traditionalist as it relates to audiophile equipment, Bose impresses me on numerous fronts. In short, I love the 3-2-1 system and would buy one ASAP except for one thing. It doesn't have AM/FM HD Radio compatibility. I e-mailed Bose and asked them about this, noting a segment from the Sound & Vision Magazine 2006 buyers guide where on page 72 it says: "As of April 2005, 2,000 stations, reaching 60 percent of the U.S. population, had signed on for it."

Here's the reply I received from Bose:

With more than 40 years invested in research, Bose Corporation is a proponent of technological advancement in the consumer electronics industry.

We will only ask our customers to invest in new audio and video formats when those formats have been established as industry standards and are widely supported by the electronics industry. Our engineers are continually researching and evaluating new audio/video technologies and, when they are proven to provide good value and continued benefits, we incorporate them into our products.

For example, we may choose to adopt a new disc format only if discs are widely available; we may adopt a new radio reception technology only when broadcasts are not limited to a small area or small audience.

Thank you for contacting Bose Corporation.
Aric MacDonald Ext. 61068
Customer Support Team

Chriss, this is a disappointing reply considering the fact that the Bose slogan says, "Better sound through research." With 2,000 stations committed to it and allegedly over 600 actually broadcasting in HD, how could any company's marketing department not see the advantages of jumping on this now?

The bottom line for me is this. I don't even want to spend $50 much less $1,500 or more for a piece of entertainment equipment that will eventually have an outdated tuner. With the news I just recently heard that HD TV sales are just beginning to outpace analog TV sales, it's high time for radio receiver manufacturers to get on the HD Radio bandwagon, and not just on top-of-the-line units either.

name withheld by request

Accuracy counts

I read the comments presented by Scott Boehme of The Society for Accurate Information and Distribution Foundation in the December 2005 issue. The following comment caught my eye: "A station has to rent IBOC for a lot of money." Wrong! A station makes an outright licensing purchase and does not have to "rent" IBOC for a lot of money. Mr. Boehme should look again at the name of his organization and consider the information presented in his statements.

Thomas R. Ray, III, CPBE
vice president, corporate director of engineering
Buckley Broadcasting/WOR Radio
New York City
"Hi, I'm Rick Adams. I am executive producer, host, also producer, technical director, technical person, I make tea. This is my show. This is my studio. I do everything. This is an online radio show from AOL and basically we broadcast live here everyday using this fabulous board from our friends at Radio Systems. And of course, those are the people who brought you the extremely good and marvelous StudioHub which I will be talking more about later. This is my studio. We broadcast to over a million kids a week and we are very happy about it. That's a million kids a week. Awesome. Did I tell you, by the way, that we broadcast to a million kids a week."

"Look, sure we use XLR's. They're very important. Look how nice they are. They are good, a very great thing and I'm glad we have them. I love XLR's. The problem is, you're like - I got this, but I can't make it work with the other thing. If only you had Radio Systems StudioHub, right? Because then, you'd be able to get, like, use a CAT-5 or an R145, or whatever you call it."

"See this? Genius! Genius! So, the StudioHub, is really a good thing. And it means if you've got this, you can just plug into anything. It's really incredible. So, thank you Radio Systems. Thank you StudioHub!"

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Differences of opinion

We all know that the PD and GM judge sound quality from a different reality. This is not a slam, rather a simple observation. The reality is that we engineers as screwdriver heads are not always in possession of a right-brained perspective when it comes to sound quality and proper implementation. That said, it has been mused about my office that HD Radio should be markedly different in its audio quality than its analog counterpart. I view that to be totally off the mark because the transition blend from analog to digital would be so obvious (to my left brain)—they view it as showing off the increase in sound quality and thus a motive for buying such technology.

All this is to say that the purveyors of HD Radio technology should keep this in mind: A complete phase-aligned signal pathway with a full complement of processing DSP would be just what the right-brainers ordered.

Michael Kernen
Chief Engineer
Greater Media Detroit,WCSX/WMGCC/WRIF

Good observation, Michael. The Trends in Technology feature in the April issue will look at some of the aspects of processing bit-reduced audio such as HD Radio.

Also, because of the traditional heavy-handed approach to audio processing analog signals, there is a growing interest in a more subtle approach on digital signals.

—Chris Scherer

Reception with the Recepter

I have been listening to stations with the Boston Acoustics Recepter HD radio, and I have to tell you that I am impressed with this receiver’s selectivity.

I use rabbit ears for FM reception and receive every New York-area HD Radio station. Currently, WPLJ is running HD 1, 2 and 3 streams. What I have noticed with the BAs HD Radio reception is that stereo separation in digital is much more pronounced, and the HD 2 channels run what appears to be about 80 percent as loud as the HD 1 channel.

As with any new technology, there is a learning curve, although with this radio there’s more learning what the radio is capable of as opposed to how to use it.

The weakness is in the antenna provided with the radio. Is it a lack of sensitivity or the fact that an external antenna is needed to make the radio shine? Again, who purchases a component-quality receiver and doesn’t connect an external antenna to it? I have never operated a receiver with such spectacular skirt selectivity characteristics. The absolutely clean second-adjacent audio demos I’ve provided speak volumes to that selectivity and I am in a region served by many city-grade signals on both bands.

The fact that an HD Radio-encoded FM station can provide three separate channels of high quality digital stereo audio on one frequency should more than satisfy the few who claim that they cannot listen to an out-of-market station because of HD Radio’s effect on analog receivers. With the additional channels come additional formats to choose from. Most people tune to the strongest signal and do not DX the commercial broadcast bands anyway.

As for IBOC on the AM broadcast band, it’s a work in progress. Some very well-engineered stations such as WOR sound terrific as if one were listening from an off-air monitor at the station. But because the bit-rate is near minimum for quality reception (remember we’re dealing with a much noisier segment of spectrum) sometimes due to error correction techniques in the radio some small artifacts can be heard. The codec currently used is, in my opinion, far superior to that used by iBiquity a few years ago. One other issue will have to be addressed: the use of multiple compression schemes from origination to end user.

Still, HD Radio is a major improvement in how we receive our broadcast signals and for a first generation receiver the Boston Acoustics Recepter is quite impressive and takes advantage of everything HD Radio has to offer.

I made an audio demo of some of the signals that I have received with the radio. [Go to beradio.com to hear the file. Click on Reader Feedback in the March 2006 issue and follow the link to the audio file.]

The demo features different stations that I received on a single afternoon. I was able to receive several different adjacent-channel stations running IBOC.

The first station on the demo (WOR, New York) demonstrates the kind of signal I received. It acts as the control in this experiment. The next signal on the demo was recorded during the start of afternoon critical hours. The station is WLW, Cincinnati on 700kHz. WOR was still running its IBOC encoder on 710kHz.

Likewise, the recordings of WPIT (730kHz 5kW, non-D) were made while WOR was running IBOC. The lack of any digital QRM is immediately noticeable.

So much for the complaints of IBOC causing interference to second- and third-adjacent stations.

Dave Saviet
New York City
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Today's digital broadcasting environment calls for a digital solution. The AES-302 features a two input digital switcher with automatic switching upon silence or digital errors. Digital radio means you need more outputs than ever. That's why we incorporated a four output digital DA in the AES-302. We didn't forget about analog either. There is a high quality analog output of the selected input available too. Many solutions in one package make the AES-302 indispensable for your transmitter or studio switching.

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The SRC-8 III is a computer interface to the real-world. Connected through an RS-232 or RS-422 serial port, the SRC-8 III can notify your PC software program that any of the 16 optically isolated inputs have been opened or closed and allows your software to control eight SPDT, 1-amp relays. Communication with the SRC-8 III can be accomplished via short burst type ASCII or binary commands from your PC (computer mode). Also, two units can be operated in a standalone mode (master/slave mode) to form a "Relay extension cord" with 32 channels of control in each direction. The unit can communicate at data rates up to 38400. The SRC-8 III may be expanded to 32 inputs x 32 outputs.

**SRC-32**
The SRC-32 is a computer interface to the real-world. Connected through an RS-232 or RS-422 serial port, the SRC-32 can notify your PC software program that any of the 16 optically isolated inputs have been opened or closed and allows your software to control sixteen SPDT, 1-amp relays and an additional 16 open collector outputs. Communication with the SRC-32 can be accomplished via short burst type ASCII or binary commands from your PC (computer mode). Also, two units can be operated in a standalone mode (master/slave mode) to form a "Relay extension cord" with 32 channels of control in each direction. The unit can communicate at data rates up to 38400. The SRC-32 may be expanded to 128 inputs x 128 outputs.

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**VAD-2**
The tiny TOOLS VAD-2 is a user-programmable two-channel page/paging device with audio output. It can be used in a variety of applications, including voice paging, voice announcement, and voice alerting. The VAD-2 provides a powerful tool for communicating with remote locations. It can be used to control equipment remotely, including relays, lights, and other devices. The VAD-2 can be programmed to perform a variety of tasks, including sending messages to remote locations, and controlling equipment remotely.

**ESS-1**
The ESS-1 provides a cost-effective, small-profile solution for standard serial-to-Ethernet connectivity. Designed with the broadcast in mind, the ESS-1 is equipped with extensive RFI protection. It is ideal for applications requiring data support for both RS-232 and RS-422 communications. The ESS-1 allows any device with a serial port, Ethernet connectivity and is ideal as a serial bridge/routing or applications where a COM port, TCP Socket, UDP Socket, or Multicast functionality is needed. The small profile of the ESS-1 makes installation hassle-free.

**AVR-8**
The AVR-8 is a voice remote control system that automatically reports changes detected any of its eight status inputs to a remote telephone and/or pager. By speaking a greeting message that identifies the source of the call, the AVR-8 then speaks a unique message for each status input. The user may customize each factory-recorded message. After reporting, the AVR-8 is ready to receive commands through your telephone keypad. Functions include retrying the AVR-8 to report on the input state of any of the eight status inputs, commanding the AVR-8 to pulse any one of its four SPDT relays for 750 ms and/or turn on any of the relays on or off. A relay command is given, the AVR-8 speaks the relay name followed by the "on" or "off" message.

**Time Sync Plus**
The tiny TOOLS Time Sync Plus provides four separate GPS time referenced outputs. The first is a SPIG relay, which pulses at 12:00, 22:00, 42:00, 54:30 each hour and is user programmable in each of four locations for any minute and second each hour. The second output is a spiralg relay with a 100 ms pulse each second while the third output is a SPIG relay. The SPIG relay provides a time zone adjustable hours, minutes and seconds time code. The last output provides a 22:00 relay with a 100 ms pulse each second. The last output is user programmable in each of four locations for any minute and second each hour. The fourth output provides a SPIG relay with a 100 ms pulse each second. The fourth output is user programmable in each of four locations for any minute and second each hour.

**ARR-8**
The tiny TOOLS ARR-8 is a voice remote control system that automatically reports changes detected any of its eight status inputs to a remote telephone and/or pager. By speaking a greeting message that identifies the source of the call, the ARR-8 then speaks a unique message for each status input. The user may customize each factory-recorded message. After reporting, the ARR-8 is ready to receive commands through your telephone keypad. Functions include retrying the ARR-8 to report on the input state of any of the eight status inputs, commanding the ARR-8 to pulse any one of its four SPDT relays for 750 ms and/or turn on any of the relays on or off. A relay command is given, the ARR-8 speaks the relay name followed by the "on" or "off" message.

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**USED FM TRANSMITTERS**

<table>
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<tr>
<th>Power</th>
<th>Model</th>
<th>Year</th>
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<tr>
<td>1.5 KW</td>
<td>BE FM 1.5A</td>
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<td>2.5 KW</td>
<td>Continental 614R-1</td>
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<td>5 KW</td>
<td>Harris FM 5K</td>
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<td>6 KW</td>
<td>Henry 6000D</td>
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<td>7+ KW</td>
<td>Harris Z16 HD</td>
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<td>10 KW</td>
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<td>12 KW</td>
<td>CCA 12,000G</td>
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**NEW TV TRANSMITTERS**

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<tr>
<td>20 KW</td>
<td>VHF &amp; UHF TV Antennas (10W to 10KW)</td>
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**USED AM TRANSMITTERS**

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<th>Model</th>
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<td>1 KW</td>
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**USED MISC. EQUIPMENT**

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<td>Donon 720R Cassette Player</td>
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<td>Potomac Phase Monitor AM19</td>
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<td>Potomac Phase Monitor 1901 Digital</td>
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<tr>
<td>Sola Voltage Reg. 60Hz 1 KVA</td>
<td>1982</td>
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- Experience with high power AM RF
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Do you remember?

Twenty years ago, the Fluke 9000 series Micro-system Troubleshoooter line offered an asynchronous signature probe option. With this option, engineers could pinpoint every digital hardware fault on a board, including faults in circuits that operated independently of the microprocessor bus cycle. Engineers could test boards with this system’s built-in, preprogrammed test routines. Users could automatically check the entire microprocessor kernel—bus,ROM,RAM and I/O. The probe option also eliminated the need for a logic analyzer or scope to test asynchronous circuits.

The system installed into a new or existing 9000 series unit, and offered signature analysis, waveform capture and event counting. The 9000 could diagnose DMA controllers, disk controllers, communication circuits, peripheral controllers and dynamic RAM timing relationships.

Sample and Hold

Broadband-enabled hotels expected to increase


That was then

In its May 1969 issue, Broadcast Engineering ran an article called “FM Proof of Performance.” This article sought to answer the question of why FM is better and how to prove that it’s better so engineers will actually use it. At the time, all FM stations were required to make a standard monaural proof. If a station also broadcast part of the time in stereo it had to run an additional stereo proof. The “system approach” emerged—measurement from mic terminals input to transmitter output.

This picture, from the cover of the May 1969 issue of Broadcast Engineering, shows Patrick Finnegan as he performs a proof-of-performance test. Broadcast Engineering began a three-part series on radio station proof of performance measurements in response to the increasing number of violations cited by the FCC.
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