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Wireless Broadband Internet Remotes

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Currents Online

Selected headlines from the past month.

NAB Announces Engineering Achievement Award Winners

Victor Tawil of MSTV and Louis A. King of Kintronic Laboratories will be honored during the Technology Luncheon on April 18.

King

Tawil

Ibiquity Unveils New Licensing Incentive Program

The program allows participating groups to lock in discounts on future station acquisitions, making it particularly advantageous to smaller groups and independent station owners.

NRSC Releases Results of AM Audio Study

The study will help the NRSC's AM Broadcasting Subcommittee determine if any changes should be made to the NRSC standards that define optimal bandwidths for AM transmitters and receivers.

Sirius and XM Plan to Merge

The rumors of a possible merger between the two satellite radio providers has come true.

Orban Ships Optimod-DAB 6300

With 20kHz audio bandwidth and 48kHz internal sampling rate, the 6300 succeeds the Orban Optimod-DAB 6200.

R.V.R. to Manufacture HD Radio Equipment

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Sharper Image Adds HD Radio

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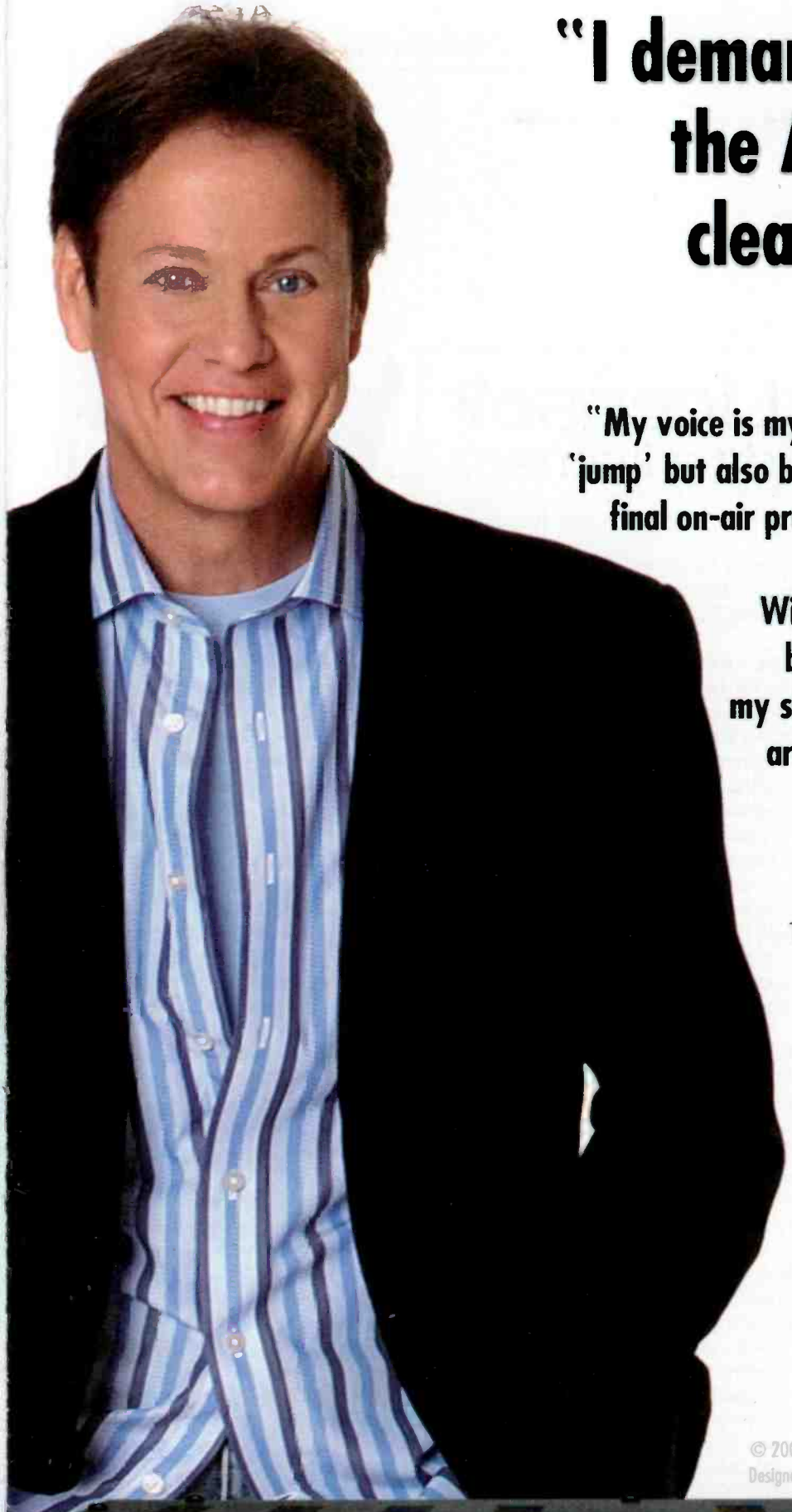
Industry Events

The Industry Events section lists upcoming conventions and conferences.



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License?
Who needs a license?

As a broadcaster, you operate your station under the guidelines of the FCC rules. We can all agree that there are certain shortcomings in the rules and the process that creates the rules, but for the most part they work pretty well.

Many believe that there is insufficient variety in the voices heard on the airwaves, so with good intentions (and a disregard for the laws of physics) LPFM was created by an act of Congress in 2000. The process to obtain an LPFM license follows a course of action similar to a full-power license.

The rules and procedures are in place to try to maintain harmony on the airwaves. But what if an individual decides that he wants to operate a station but does not want to obtain a license? The person becomes a pirate broadcaster and violates FCC rules. If the FCC learns of this pirate, it can take steps to shut the station down. If the pirate begins broadcasting again, he can and should be shut down again. Unfortunately, it doesn't work this way any more.

A pirate LPFM station in Goldfield, NV, operated by Rod Moses, has shown radio pirates how to circumvent the FCC rules. Moses' Radio Goldfield Broadcast operated a pirate station, was shut down by the FCC, and then found a senator to help him skip all the due process and obtain a special temporary authority (STA) to operate the pirate station. The pirate has been legalized.

I credit Moses for his ingenuity in getting what he wanted. In this case, he didn't like the rules so he found a way to write new ones. Senator Harry Reid of Nevada overstepped his authority and the FCC cowered and caved.

Sen. Reid contacted FCC Chairman Kevin Martin to endorse the Radio Goldfield operation, touting its public interest contributions. In response, the FCC issued the STA on Jan. 29, 2007, stating that the FCC can grant an STA in cases of "extraordinary circumstances requiring temporary authorizations in the public interest." The public interest is served by Radio Goldfield's reports on road conditions, local law enforcement and public safety. Funny, the STA made no mention of the music being played from an MP3 player.

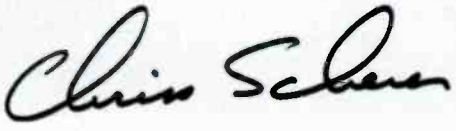
If Sen. Reid wants to change the allocation process, he should do so in the proper way so that it benefits all broadcasters and not just voters in his state. Likewise, if the FCC wants to change the rules to allow unallocated broadcasts, it has a mechanism in place to change its rules.

The act that created LPFM included a stipulation that any station that previously operated as a pirate station would be ineligible to obtain an LPFM license. Granted, Moses does not have an LPFM license—in fact he never applied for one—but the same standard should apply.

I also wonder if Moses is maintaining records so that he can pay the appropriate music licensing fees for the music he plays on the air.

Now that this is done, why should any pirate be concerned with the FCC rules? Just apply for the STA and state that the station serves the public interest. The end result is that an individual who violated FCC rules has been rewarded with a temporary license. This is a bad precedent any way you look at it.

I urge you to take action immediately. Send a protest letter to Chairman Kevin Martin and copy Peter Doyle, chief of the Audio Division at the Media Bureau. You can also file a petition for reconsideration. If you live in Nevada, I also encourage you to express your displeasure with Senator Reid.



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Washington, DC 20554.

Senator Harry Reid
528 Hart Senate Office Bldg
Washington, DC 20510

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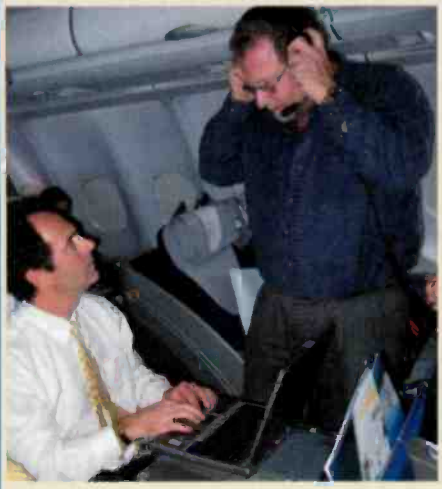

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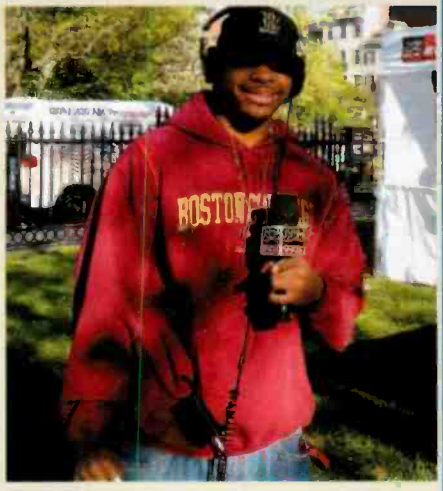
JAMN 94.5—Walk for Hunger



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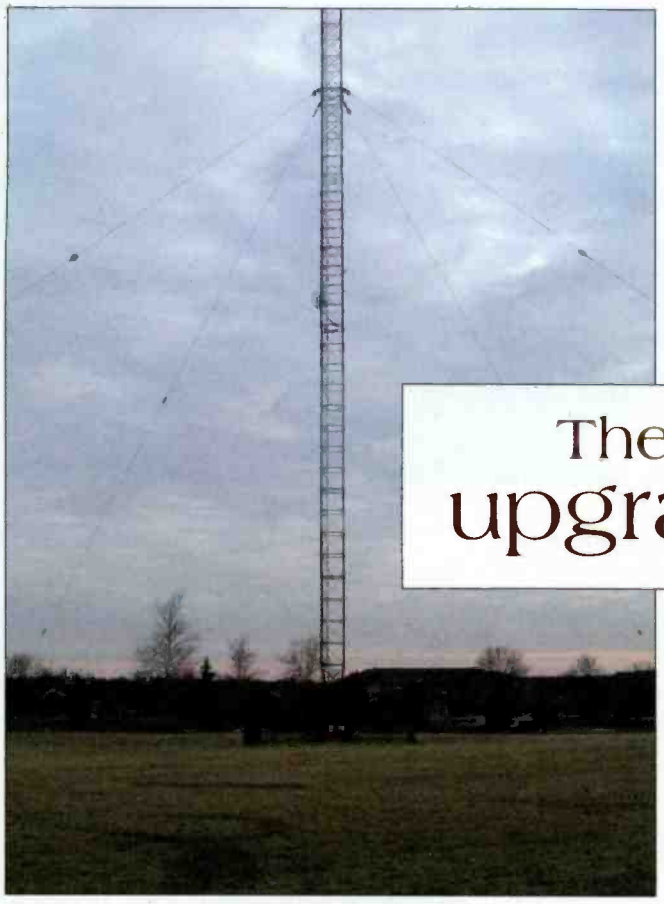


The path to upgrading

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

Sometimes the upgrade project originates with the chief engineer who is tired of managerial complaints that valuable income-producing areas are not adequately covered. Sometimes the manager comes up with a grandiose idea of increasing the number of people served and coincidentally advertising higher power. In the former case the engineer has probably arrived at some idea of how the improvement will be developed. In the second case it may turn out to be a pipe dream and the engineer is expected to come up with an answer.

The best way to deal with the second situation is to ask how much money the manager is prepared to spend on facilities improvement and what he expects. If he has no good answer to this question my advice is to say something like "That's a good idea!" and hope that he forgets it. If, on the other hand, he has an intelligent answer the procedure should be similar to the one you would follow if you had come up with the idea.

The procedure depends on the type of facility you are upgrading, its mode of operation and your own capability. Let's consider an AM station because they are typically the most complex. This may be an old daytime station with a small, almost gratuitous, nighttime power with or without a DA, a full time non-DA operation, a DA1, a DA2 or even a DA3.

If the proposed upgrade involves daytime operation run what I call a 25μV/m check (sometimes called the 025). This considers the daytime groundwave interfering contour that could interfere with existing co-channel stations and must not overlap the standard daytime 0.5mV/m protected contour. If you find an overlap using a non-directional antenna, a DA will probably be required.

This test will provide an idea of any co-channel interference problems, and immediately indicate a potential need for a directional antenna or may even show that a daytime power increase is not feasible.

If you are considering an upgrade to the nighttime operation, look at the existing night contour and consider the class of station. The object of this inspection is to determine how much work will be involved in the project and estimate whether it's worth spending the money and time.

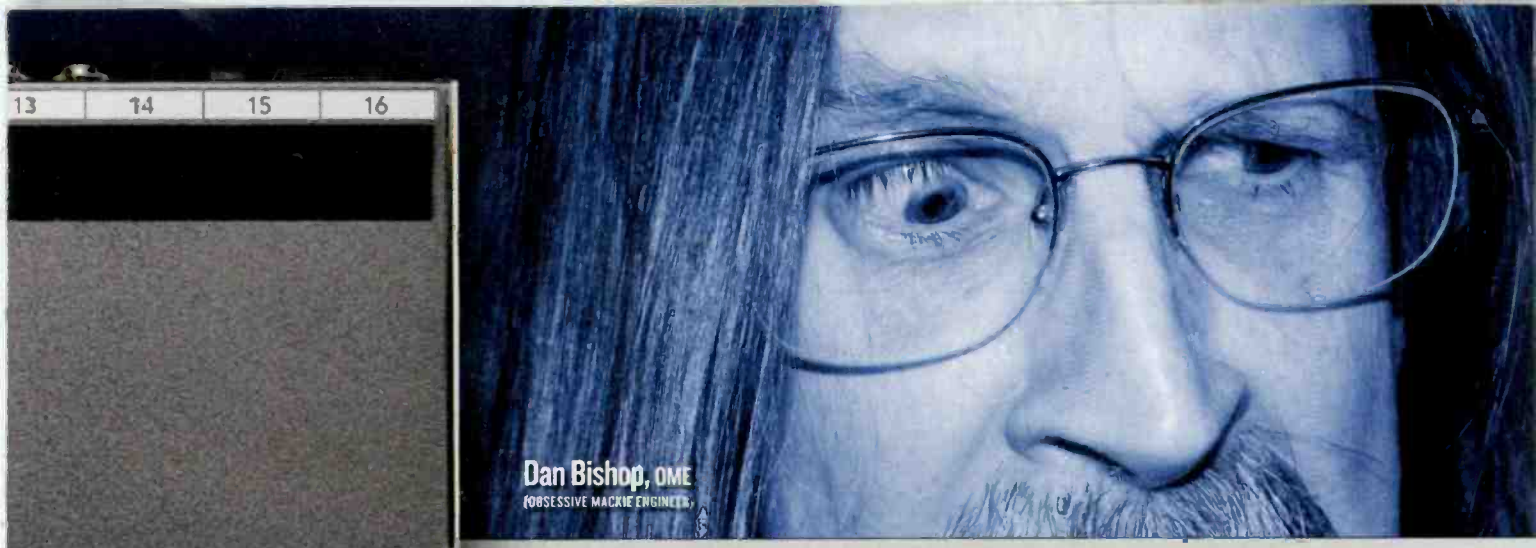
If the proposed upgrade operation is for a nondirectional daytime station the station's chief engineer may decide to do it himself using one of the numerous software services that are now available. [See Trends in Technology in the January 2007 issue for some ideas.]

Either way, if it looks as though a DA or a larger existing DA will be involved stop and think about real estate and cost.

Location, location

If the existing transmitter site is large, or is in an area where additional ground can be reasonably obtained, it may be worth spending additional time and money determining how much extra space, and its cost, will be required. If, on the other hand, the original site is small, nondirectional and surrounded by housing estates or other commercial property a new problem arises. Operation on that site will not be possible.

Site suitability and availability are important



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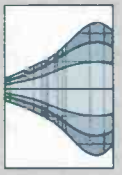

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factor because in these days of shrinking real estate suitable for transmitter antennas, land cost can be prohibitive. This must be taken into consideration before spending a lot of money and time preparing Form 301 and associated exhibits, and then discovering that the upgrade is not feasible.

Assuming that a nighttime power increase is possible, a multi-tower antenna system requires finding a new site. This is the beginning of a long series of filing applications and tying up land options.

Once suitable land has been found ensure that it's available and obtain a conditional option to purchase with adequate time frames. This will protect you from forced purchase if the CP is not issued. After a year or two the construction permit may be issued. It's the culmination of all your efforts and the beginning of a great deal more work.

Among other things, use permits will need to be obtained, numerous hearings from NIMBY groups will need to be attended, FAA objections will need to be overcome, electrical power requirements will need to be established and planning arrangements will need to be arranged with the power company. Transmitter building plans will need to be drawn, including water and toilet facilities. Equipment installation and wiring plans must be prepared and, in the case of remote or inaccessible locations, a provision for personnel sleeping and eating.

Gearing up

Transmission lines, transmitting equipment and towers were probably placed on conditional order at the beginning of the project. Now comes the time to confirm the order. Ground system planning should be completed next and it will be installed once construction traffic has eased.

Remote control and an STL will need to be determined while awaiting issuance of the construction permit and the necessary arrangements made with the link provider (if necessary), STL equipment ordered and STL construction permit applications filed.

Proper fencing will be required at the base of each tower together with security fencing around the transmitter building and an associated security system. Don't forget padlocks and keys for the tower base fence doors. And don't forget to obtain a large supply of keys for tower bases well as the transmitter building; somehow these always seem to get lost.

FCC approved non-ionizing radiation warning signs must be properly displayed together with tower identification and registration numbers and working telephone numbers.

Create a working timetable that includes plans for equipment testing and initial directional antenna adjustment.

Finally, after the proof of performance has been completed satisfactorily the commission should be informed and Form 302 filed in accordance with the rules.

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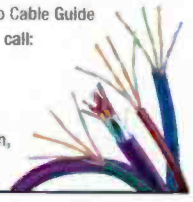

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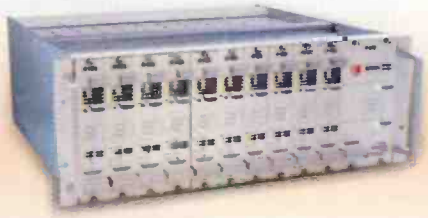

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Mid-term EEO reports due for some

By Harry Martin

Beginning in June, radio stations with 11 or more full-time employees will have to file the new FCC Form 397 Broadcast Mid-Term Report, which will provide the commission with information about each reporting licensee's on-going EEO efforts. As shown in the schedule below, Form 397 is due on June 1 for radio stations in D.C., Maryland, Virginia and West Virginia, with stations in other states following suit every other month in the order of the anniversary dates of their renewal application filings.

The requirement for a mid-term EEO report was put into place in 2002, when the FCC last revised its EEO rules and policies, and is intended to provide the commission with an accounting, four years after renewal filing, of each licensee's EEO compliance. Here's a summary of what has to be done.

What must be filed? The new Form 397 has not yet been released. A draft version of the form was prepared in 2002. It requires the standard identifying information about the licensee filing the form (name, address, station list). If the licensee is subject to the full filing requirement, copies of the licensee's two most recent annual EEO reports as placed in the stations' local public inspection file, must be attached.

When must it be filed? The schedule for filing Form 397 is based on the staggered schedule for filing renewal applications. Thus, the schedule for 2007 and 2008 is as shown at the right.

Who must file? Only employment units with 11 or more full-time employees will have to submit Form 397 (together with copies of their annual EEO reports taken from their public files). Smaller stations (stations with fewer than 11) appear to be exempt from the filing requirement, although once the final version of the form is adopted it is possible smaller stations will have to file a Form 397 just to claim the exemption.

The FCC will be examining each Form 397 to determine whether the licensee has been complying with the rules. Any non-compliant broadcasters will be contacted by the FCC, and if the non-compliance is significant enough, the commission will consider issuing a forfeiture notice.

Availability of Form 397

The revised Form 397, as of this writing, is still awaiting approval by the Office of Management and Budget, and is expected to be available electronically in April or May, which would be in time for the initial June 1 deadline.

This new filing requirement should be routine for most stations. As long as the licensee has been preparing its annual EEO public file reports—a requirement for all stations that have five or more full-time employees—and those reports indicate that EEO-sensitive recruitment procedures have been followed except in extraordinary situations, no compliance issues should arise.

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

Dateline

Radio stations in Texas must file their biennial ownership reports on or before April 2, 2007.

Also on April 2, radio stations in Delaware, Indiana, Kentucky, Pennsylvania, Tennessee and Texas must place their 2007 EEO reports in their public files and place them on their websites.

All radio stations must place their first quarter issues and programs lists in their public files by April 10.

Form 397 filing schedule

June 1: D.C., Maryland, Virginia, West Virginia
August 1: North Carolina, South Carolina
December 1: Florida, Puerto Rico, the Virgin Islands
February 1, 2008: Arkansas, Louisiana, Mississippi
April 1, 2008: Indiana, Kentucky, Tennessee
June 1, 2008: Michigan, Ohio
August 1, 2008: Illinois, Wisconsin
December 1, 2008: Colorado, Minnesota, Montana, North Dakota, South Dakota

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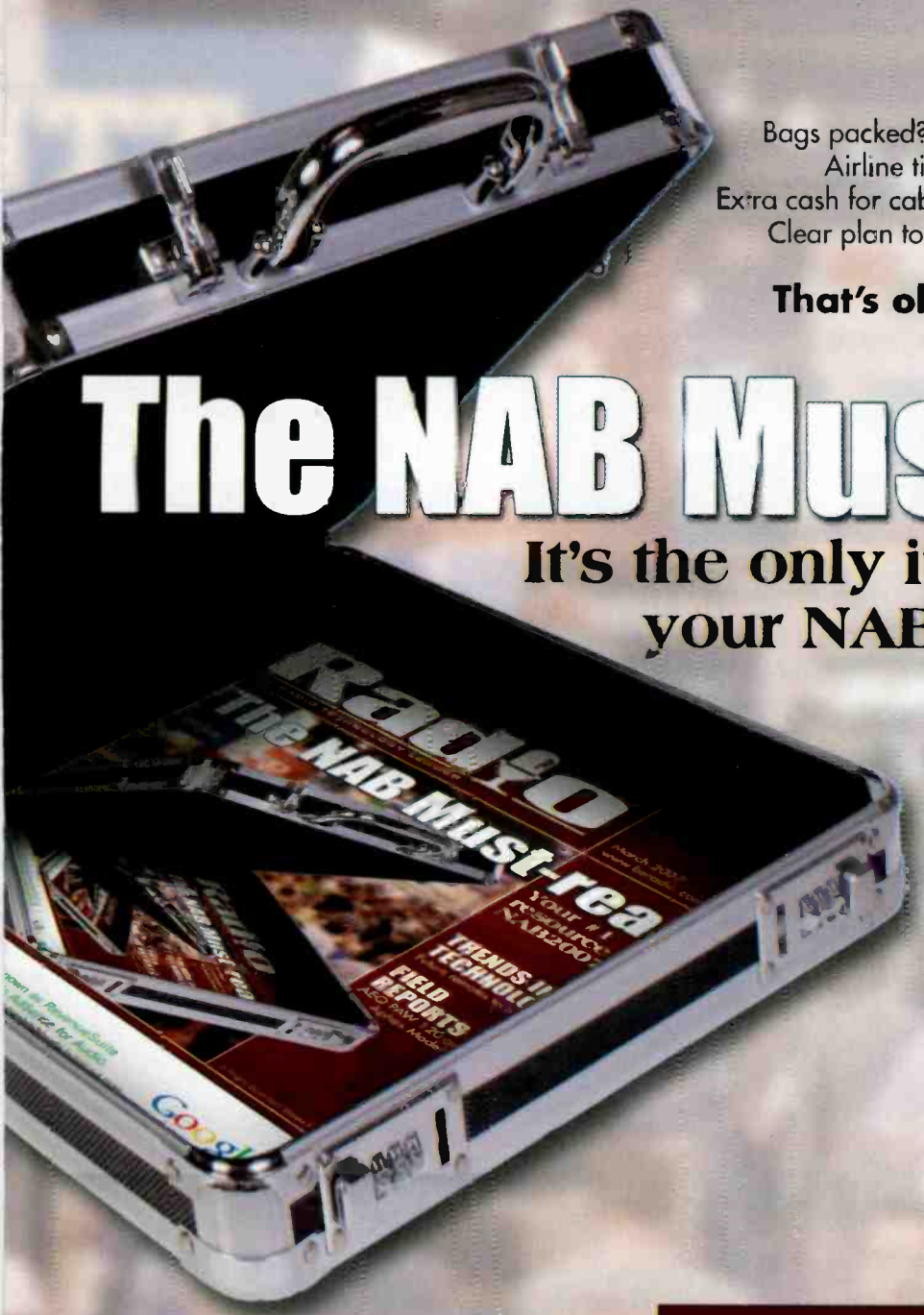
The NAB Must-read

It's the only item needed for your NAB2007 checklist



Registration areas

There are two registration areas for the convention. One is in the North Hall near the taxi drop off. The other is at the back of the South Hall Lower.

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Online Extra

The NAB Insider e-mail newsletter complements our convention preview. It comes to your e-mail inbox every Tuesday leading up to the convention. If you're not receiving it, go to beradio.com and click on the subscribe link.

Radio NAB Insider

The NAB convention is a huge event, and the common mistake made by attendees is to not plan ahead. The convention floor is huge. The sessions run non-stop. There are even more exhibitors in hotel suites. Where do you begin? Right here with the March issue of *Radio* magazine.

The NAB convention has been held in Las Vegas for the past 17 years. Las Vegas has the deserved reputation of being an adult playground, but the city is a good place to hold a convention because it can accommodate the flood of visitors. Still, once you're in the Convention Center, you're on your own.

Our convention preview has several parts to help you plan your time. The most visible part of the convention is the exhibit hall. In this case, there are four of them plus an outdoor exhibits area. This massive exhibit area itself can't be completely covered in four days. It's 1/3 mile from the north end to the south end alone. The NAB Extra! is a collection of products that will be unveiled, so you can get a head start on what to see. We'll also have some stragglers to include the April issue, so don't forget to look there as well.

Navigating the show floor can be a challenge, so we have two tools to help you. The major portion of radio exhibitors are in the North Hall, so we have highlighted this section with a pull-out map. Additional copies of this map will also be distributed in our booth in the North Hall (N6128).

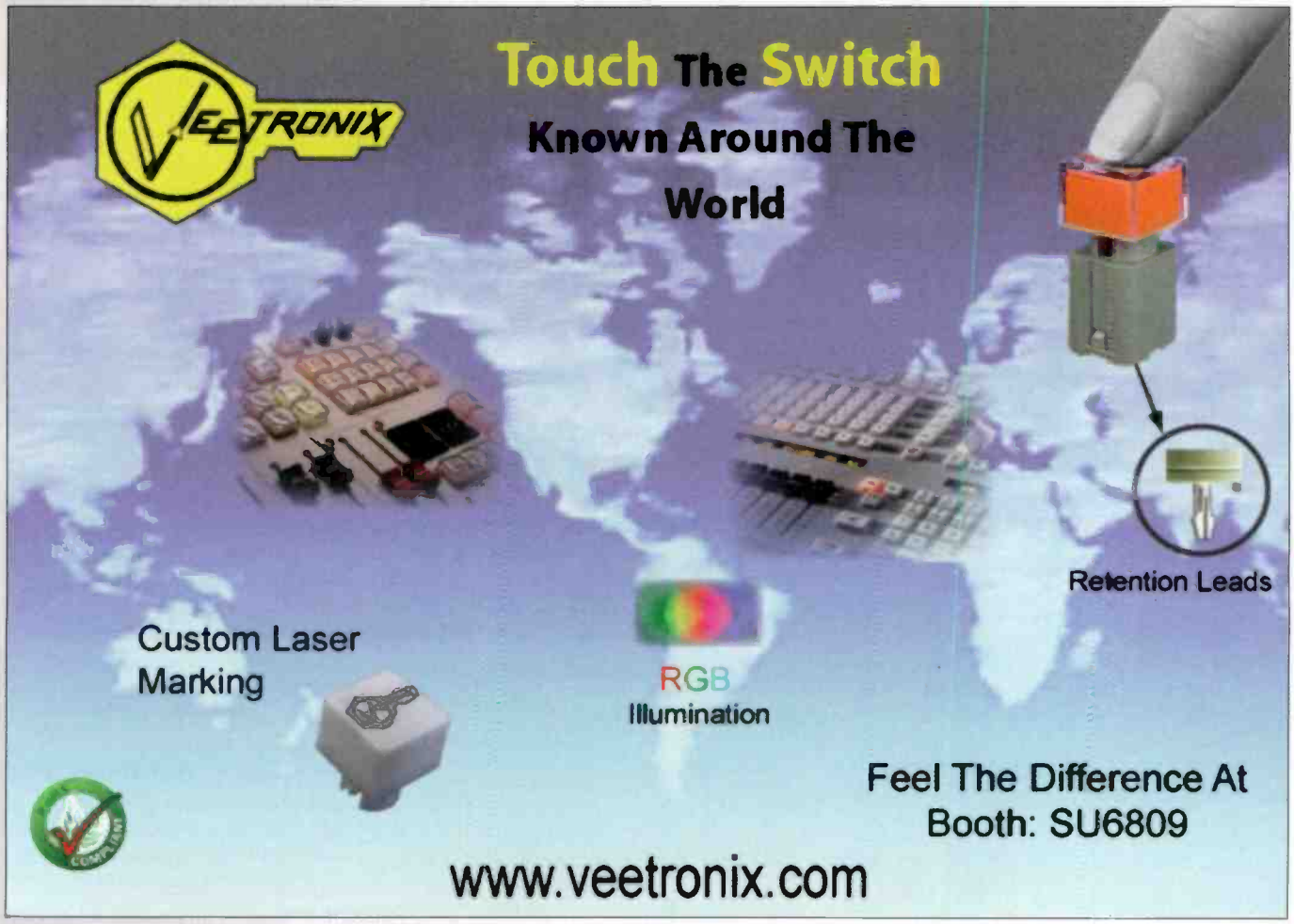
Because you're probably going to the convention with some specific equipment quests, we have also organized the exhibitors into categorized listings in the FASTtrack. In addition, the exhibitors in these categories are arranged in booth order so you can quickly move from booth to booth with the most direct path. Don't waste time backtracking, use the FASTtrack to plot the most direct course.

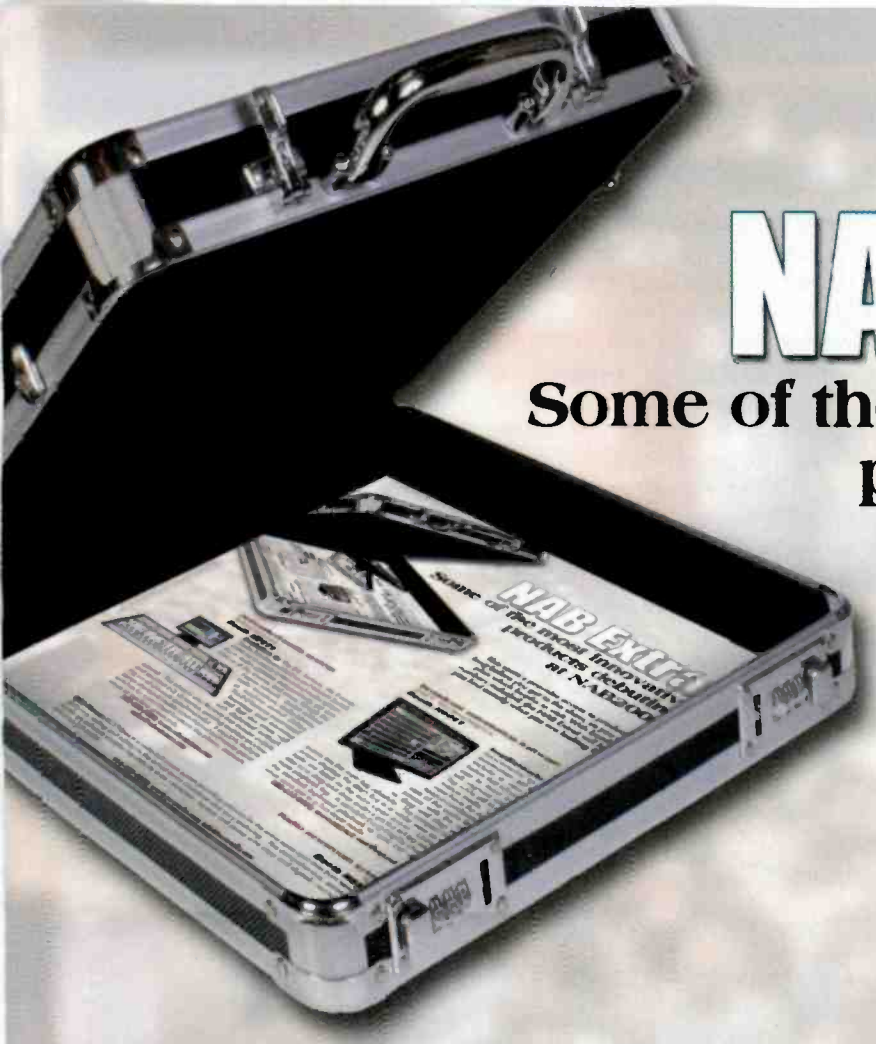
What's a convention without sessions? Again, time is short, so you have to pick and choose which sessions you want to attend. We have outlined the radio-relevant sessions in the Insight to Sessions section so you can decide which sessions are right for you. We have also included some sessions outside the Broadcast Engineering Conference that may be of interest. All of this is then displayed in a timetable grid so you can plan your day.

Your time in Las Vegas doesn't need to be all business. Get some extra tips from the *Radio* magazine staff. Turn to page 84 and get some inside tips.

Now you're ready for NAB2007. See you in Las Vegas.

Chriss Scherer, editor





NAB Extra!

Some of the most innovative products debuting at NAB2007

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.

Networked audio system
Wheatstone
Booth N7111

Evolution 6: The E-6 Surface, the E-series Studio Satellite and the E-series Network Switch combine to create a networked audio system. Each studio operates independently yet can share all the sources and mixes through the E-series network. Switch without traffic limitations, audio latency or machine control delays. The E-6 features event recall, bus-minus and mix-minus and four aux mixes—all with dedicated talkback systems. The console also features four monitor outputs and standard EQ, dynamics, panning and mic processing on all channels (simultaneously). It supports multiple arrays of programmable input channel and master panel switches for customized functions like phone, intercom, salvos or machine commands.

252-638-7000; www.wheatstone.com
sales@wheatstone.com

Broadcast automation software
OMT Technologies
Booth N9011

Imediatouch: Enhancements to this automation software include a new talk button that allows the user to insert a live talk segment into the log while still in automation mode. Users now have the option to use a condensed version of the audio library screen with the ability to drag and drop audio events into the main log schedule. The compact full log screen displays the day's log in a wider view so more items are listed on the main on-air screen. Users can also now drag and drop audio from the full log into the main playback log. A cart-style Event Display changes the standard log-based playback to static cart decks when users are in a live assist mode.

888-665-0501; www.omt.net; omt@omt.net

Radio newsroom system
RCS
Booth N6511

RCS News: RCS News is a radio newsroom system providing solutions for the entire news operation from newscast gathering, writing and editing to the actual on-air broadcast and story archiving. This comprehensive, standalone newsroom software enables reporters to write newscasts, receive and revise wire copy and digitally record, edit and playback audio.

914-428-4600; www.rcsworks.com; info@rcsworks.com

Booth numbers are current as of Feb. 23

the professional broadcaster's choice for

IP STLs

WorldCast Eclipse

At last! An IP audio codec that offers a reliable, DSP-based platform and automatic back-up for 24/7 reliability.

APT's WorldCast Eclipse is the ultimate in flexibility and choice offering IP, X.21/V.35 and ISDN interfaces and a selection of popular coding algorithms including Enhanced apt-X, MPEG Layer 2/3, MPEG 4 AAC, G.711 and G.722

All the features you expect from a professional broadcast codec are supplied as standard: analog and AES/EBU I/Os, adjustable silence detection, alarm ports, contact closures, speed dials, embedded auxiliary data and many more...

Configuration and control of the WorldCast Eclipse is straight-forward and simple thanks to APT's powerful and intuitive Codec Management System (CMS). Offering extensive real-time management of multiple codec units, the CMS enables alarm monitoring, logging and performance monitoring as well as configurable user and audio profiles.

To see the full functionality of CMS, download a trial version from www.aptx.com.

Also Available:

WorldCast Horizon
Bidirectional stereo audio codec offering Enhanced apt-X over IP

WorldCast Meridian
Multi-algorithm audio codec with both IP & X.21/V.35 interfaces

WorldNet Oslo
Professional, Modular Audio Multiplexing Platform offering up to 14 stereo channels over T1/ E1 or IP links with Enhanced apt-X or linear audio. Built-in redundancy, automatic back-up and hot-swappable cards ensure round the clock reliability for multi-channel STLs.

APT Headquarters
Tel: +44 (0)28 9037 1110
Email: info@aptx.com

APT North America
Toll Free: 800 955 APTX
Boston Tel: 781 810 2260
Florida Tel: 772 340 0850
Email: sales@aptx.com

APT

www.aptx.com

NAB Extra!

Analog/digital audio switcher
ATI Group
Booth N7323

UADC-1: This analog-to-digital converter and switch provides 24-bit conversion with AES3 audio path insertion and interruption functions. The device may be used as a standalone A-to-D converter or as a way to insert stereo analog inputs into an AES stream via remote control. A sampling rate of 32kHz or 48kHz is selectable via internal jumpers. Front-panel LEDs display the audio present and clipping for left and right analog inputs, the input selected for output and the status of the device. Recessed front-panel gain controls for the analog inputs are included.

800-922-8001
www.atiaudio.com; sales@atiaudio.com

LPFM antenna
Jampro Antennas
Booth C2515

JLCP: This stainless steel, omni-directional antenna is easy to install with a supplied 2" pole mount. The antenna offers higher V-Pol, which provides better car reception and building penetration. A stacking harness is included when multiple bay arrays are ordered. The antenna features a VSWR 1.5:1 or better ±150kHz.

916-383-1177; www.jampro.com
jampro@jampro.com

Internet radio
Solutions Radio
Booth N8636

Church Web Radio: This Internet receiver features a built in dial-up modem that can be connected to an existing telephone or DSL line. Turn the unit on and the service can be heard live. The system automatically stores each service so it can be listened to after the live service has ended. Call waiting has been implemented so that the system will switch off and the call can be answered.

201-977-1229; www.solutionsradio.com
sales@solutionsradio.com

See Live Demos of our Flexible Formats, STORQ Automation, and PDQ (Production Done Quickly) During NAB 2007 at our Hilton Suite

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Try a no risk demo today, and see for yourself that STORQ is:

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- Easy-to-use

STORQ Automation is comparable to any other system, but so affordable that the competition would like us to keep it a secret.

Well we can't. The secret's out!

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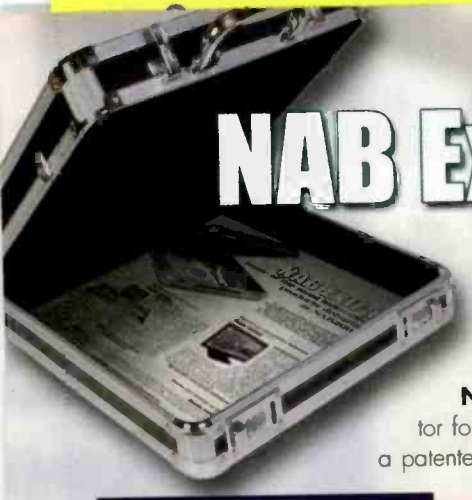

NAB Extra!

37-pin audio connectors

Nemal Electronics

Booth C2642

NE3700 series: This DT12 connector for field and studio applications features a patented set screw design that prevents insert rotation. Accessories include dust caps, fan-outs, and break-out boxes to XLR connectors. Typical applications include termination of 12-pair audio molt cable or up to 37-conductor control cable. Additional features include a positive lock insert system to prevent conductor breakage during interconnection, secure attachment of cap to connector, standard thread strain relief and compatibility with existing ITT Canon type designs. The connectors are available from stock, individually or terminated on cable.

800-522-2253

www.nemal.com; info@nemal.com

Wireless recording systems

Zaxcom

Booth N9017

ZFR800, TRX800: The ZFR800 hand-held wireless recorder and TRX800 hand-held wireless microphone provide internal recording capabilities. The TRX800 uses digital modulation and produces a time code-referenced recording that serves as a back-up. Both systems offer audio quality equivalent to AES audio on a hard-wired cable.

201-652-7878

www.zaxcom.com; info@zaxcom.com

USB stick for GSS Net

Global Security Systems

Booth N9008

USB Stick for Emergency alert: The USB stick plugs into any Windows PC supporting USB connectivy and connects the computer to the GSS Net Public Warning and Alert System. The thumb-size stick presents relevant alerts and messages. The unit is not dependent on Internet connection and features a FM radio tuner built-in. The USB supports FM RBDS.

228-255-7220

www.gssnet.us; info@gssnet.us

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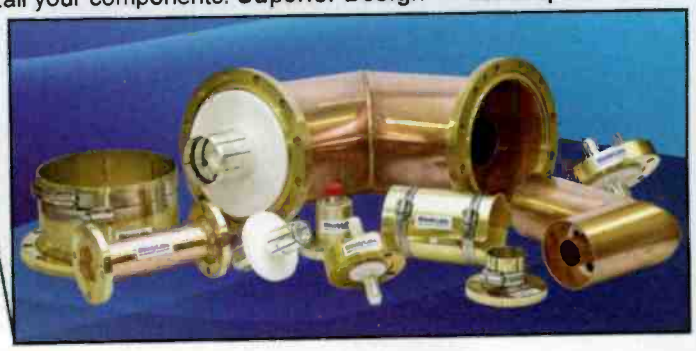

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Radio-desk
$995 msrp

Nova-10C
digital console
$2,795 msrp

1200-10s
analog console
$3,795 msrp

Radio Consoles

Radio-XP
$2,995 msrp

12K18-12
analog console
$4,995 msrp

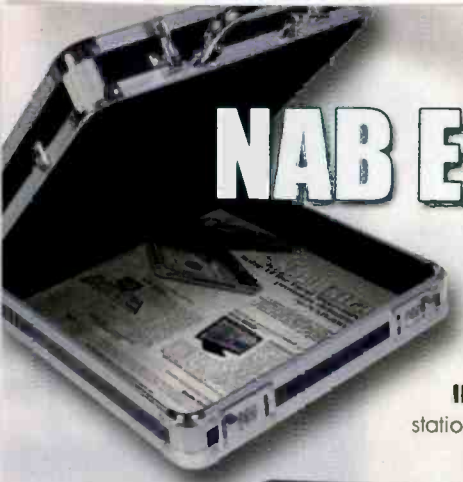
Studio Furniture

Modulux
Flex-studio
$4,995 msrp

X-Mixer digital console
$5,495 msrp (10 ch)
$6,995 msrp (14 ch)

2604 Powell St, Loveland, Colorado 80538

NAB Extra!



IFB transmitter
Lectrosonics
Booth N8116

IFBT4: This interruptible foldback base-station transmitter replaces the analog IFBT1 unit. The IFBT4 is a 250mW digital hybrid wireless transmitter for IFB and other types of radio links. The transmitter features a backlit LCD with front-panel control for programming and operation. A selectable high-pass filter with settings at 35Hz and 50Hz allows for transmission of full audio bandwidth. The equipment is powered by 6V to 18V dc via a locking connector and is supplied with a quarter-wave whip antenna that is detachable from the 50Ω BNC connector on the rear panel.

800-821-1121
www.lectrosonics.com; sales@lectrosonics.com

Digital mic
Neumann
Booth N7117

KM D series: The modular construction of these microphones permits the KM D output stage to be combined with the various passive microphone capsules (omnidirectional, cardioid or hypercardioid). In the microphone, the A/D converter receives the output signal directly from the capsule. The microphones are equipped with a three-pin XLR connector for transmission of a bi-directional signal conforming to the AES 42 standard. All standard sampling frequencies are supported, from 44.1kHz to 192kHz. An A/D converter receives the output signal directly from the microphone capsule. Level matching required for subsequent devices is performed digitally in the microphone itself.

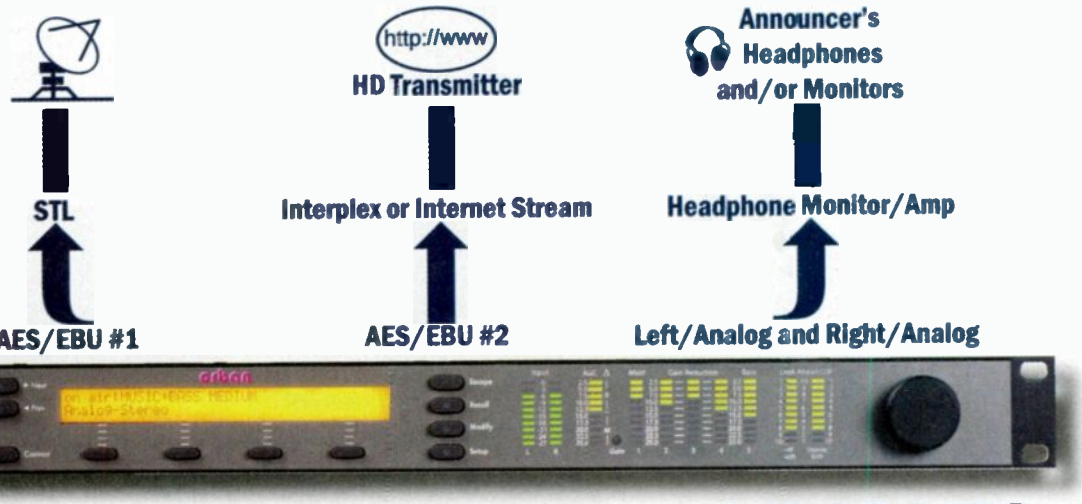
860-434-5220
www.neumannusa.com; neumlit@neumannusa.com

Going HD?

The **Orban Optimod 6300** is perfect for processing your HD digital channels.

THREE OUTPUTS

- **A studio AGC (with peak limiting for STL protection)**
- **A no-compromise processing chain for digital transmission and media**
- **A low-delay talent headphone processor**



orban 6300 OPTIMOD

FOUR CHOICES OF PROCESSING

AGC · AGC with Limiting · Multiband · Multiband with Limiting

- **Two digital AES/EBU outputs and one stereo analog output.**
- **Mastering-quality look-ahead limiter provides tight peak control for both "flat" and pre-emphasized channels.**
- **Flexible routing: Any output can emit the AGC or Multiband processed audio, with or without look-ahead limiting.**
- **Exclusive Precode™ technology minimizes artifacts in low bitrate codecs (like HD Radio's HDC) without sucking the life out of the audio.**
- **New compression ratio and knee controls makes the 6300 ideal for mastering and production studio applications.**
- **Remote controllable via GPI contact closures, Ethernet, and RS232 serial connections.**
- **Smooth, responsive PC Remote Control application for Windows PCs is included.**
- **Quick Setup wizard, dozens of excellent factory presets, and LESS-MORE control make setup and tuning easy.**
- **Includes CBS Loudness Controller™ for TV applications.**

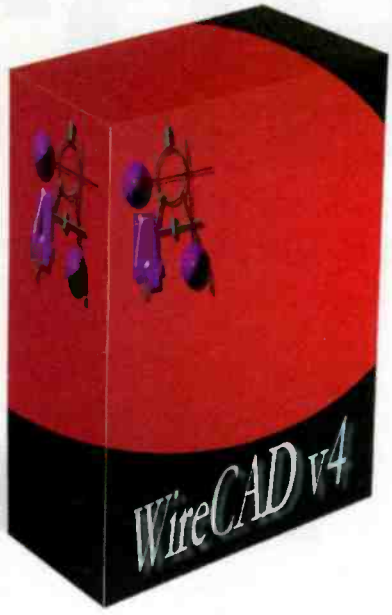
orban crl

For a list of distributors visit
www.orban.com

7970 South Kyrene Road
Tempe, Arizona 85284
Phone 480-403-8300
Fax 480-403-8301

The Orban 6300 is a high-quality, multipurpose stereo audio processor for digital radio, digital television, netcasts, STL protection, satellite uplink protection, and digital mastering. With 20 kHz audio bandwidth, the 6300 succeeds Orban's popular OPTIMOD-DAB 6200 audio processor but offers improved processing algorithms and more flexibility.

So a while back I was out walking my dog Biccup when the thought occurred to me that what the planet really need...



WireCAD

NAB Booth:
N2138

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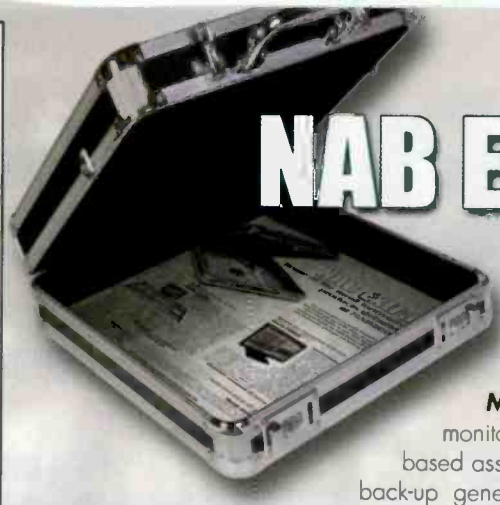
sales@wirecad.com

...was a way to avoid the tedious, time-consuming, mind-numbing, error-prone process of single-line documentation and all of the associated reports that need to accompany it. I thought there must be a better way than the manual data entry I was doing and having to maintain synchronization between changes I made in the drawings and those in the databases. It occurred to me that we needed to make documentation so easy that it actually got done! Silly thought, I know, but that is what we set out to do. And by gum, I think we got it! WireCAD does all the heavy lifting for ya'll. Come see me at the NAB show booth N2138 and tell me the name of my dog, and I'll give you ten percent off the really cool show specials that we will be running there. Thanks for taking the time to read this whole thing. Christian Holbrook, President.



NAB Extra!

Condition monitoring
Dielectric
Booth C1907

M2M: The device can monitor and manage non-IT-based assets such as HVAC units, back-up generators, security access instruments, street lamps and cooling towers. The monitor can help with predictive maintenance, which can streamline operations. The units in the M2M product line are simple enough to monitor lights at a cell tower or complex enough to manage and control a cooling tower at a large power facility.

800-341-9678
www.dielectric.com; dcsales@dielectric.com

On-air switcher
Sonifex
Booth N4928

RB-OA3: A 1RU unity gain on-air switcher, this unit is capable of switching three stereo pairs between three studios. Each studio can control the transmission path together with two peripheral paths for equipment such as a codec or hybrid. It also allows for seamless and continuous broadcast from any multi-studio radio network. The unit can be expanded to switch between five studios or six stereo pairs by connecting multiple units via RJ-45 serial connections. Features of this switcher include an input impedance of greater than 20kΩ, an output impedance of less than 50Ω, a frequency response of 20Hz to 20kHz ±0.1dB and 0.01 percent THD at 1kHz.

207-773-2424
www.independentaudio.com; info@independentaudio.com

FM transmission systems
Propagation Systems
Booth C1920

Turnkey Transmission Services: PSI now offers full FM turnkey transmission systems including a PSI antenna, PSI transmission line, transmitter of customer's choice, tower, building and commissioning. The customer has the flexibility to use all or any part of the turnkey offering. PSI antenna models include directional and non-directional using panels and Power-Tiller for FM and IBOC, at all power levels. Also available is pattern optimization, customization, multi-station antennas, filters and combiners.

814-472-5540
www.psibroadcast.com; psiba@surfshop.net

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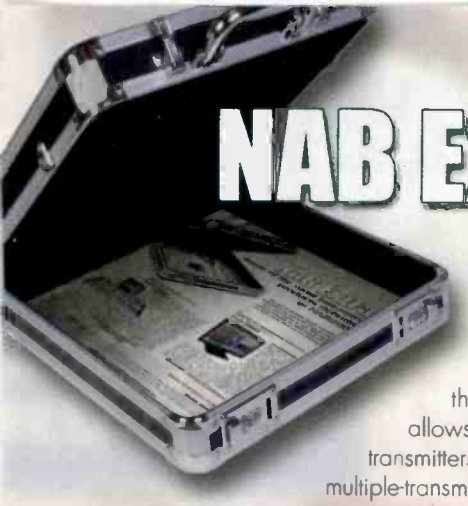

Simulcasting product
Harris
Booth N2502, N3100

Intraplex Synchrocast3: This third-generation simulcasting product allows radio broadcasters with overlapping transmitters to create audio synchronization in multiple-transmitter networks. The system uses an Intraplex T1/E1 multiplexer or Net Xpress IP multiplexer platform with GPS digital timing to enable a network of transmitters to increase coverage areas and reduce interference. The product offers more efficient use of network bandwidth by the timing system, allowing users to allocate additional bandwidth to voice and data transmission.

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

FM bandpass filter
Myat
Booth C2220

FMBP1000: This FM bandpass filter is rated for 1 kW and can be used as a standalone device to filter unwanted out-of-band energy, can provide the necessary filtering requirements for IBOC signals and can be used in a channel combining system to combine two close-spaced FM channels that would then feed a common antenna. FMBP1000 series filters attenuate unwanted signals to reduce cross modulation. The filter is available in three- and four-section designs with or without cross coupling.

201-767-5380
www.myat.com; sales@myat.com

Remote receiver
Burk Technology
Booth N8611

Watchband: This receiver provides stereo, phase and field intensity data, streaming audio and decoded RDS to any PC with an Internet connection. Broadcasters can record audio streams for remote playback, as well as log audio metrics for review and analysis. Automatic logging routines allow station-to-station comparisons for the entire market.

800-255-8090; www.burk.com; sales@burk.com

OMNIRAX BROADCAST FURNITURE

What people are saying about Omnirax...

"Within a short amount of time Omnirax was able to come up with a beautiful concept for our new studios."

"The Omnirax design makes these studios incredible for talent and operators on both sides of the console."

"Our furniture from you not only fit into our budget and timeline, it was very well constructed and looked beautiful. I expect to be outfitting many more facilities with Omnirax.."

"I was impressed with the exceptional care given packaging for shipment. A few very large and potentially fragile components made it cross-country completely unscathed"

"I wholeheartedly recommend Omnirax to everyone."

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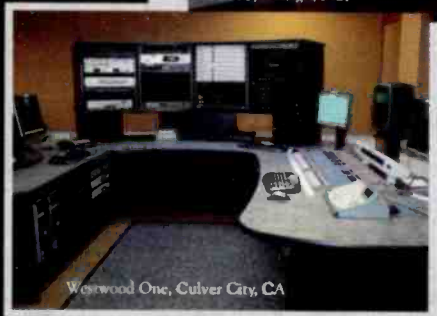
KCWU, Ellensberg, WA

WDNC, Raleigh, NC.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KCWU, Ellensberg, WA

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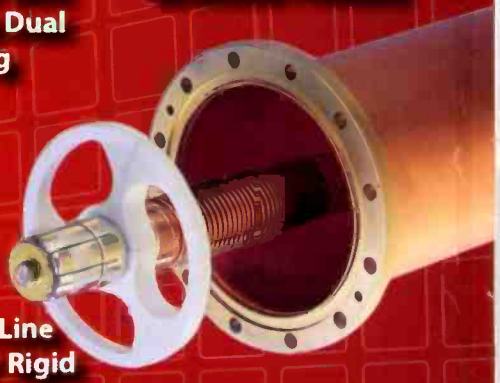

Standard Rigid Line and MACXLine® Rigid Line with Bellows

ERI is your single source for the broadcast industry's best antennas, filter and combining systems, transmission line and RF components, and towers and structural products. Our professional team of engineers, designers, fabricators, project managers, and installers take pride in contributing to your success by delivering products and services to meet all of your RF and structural needs.

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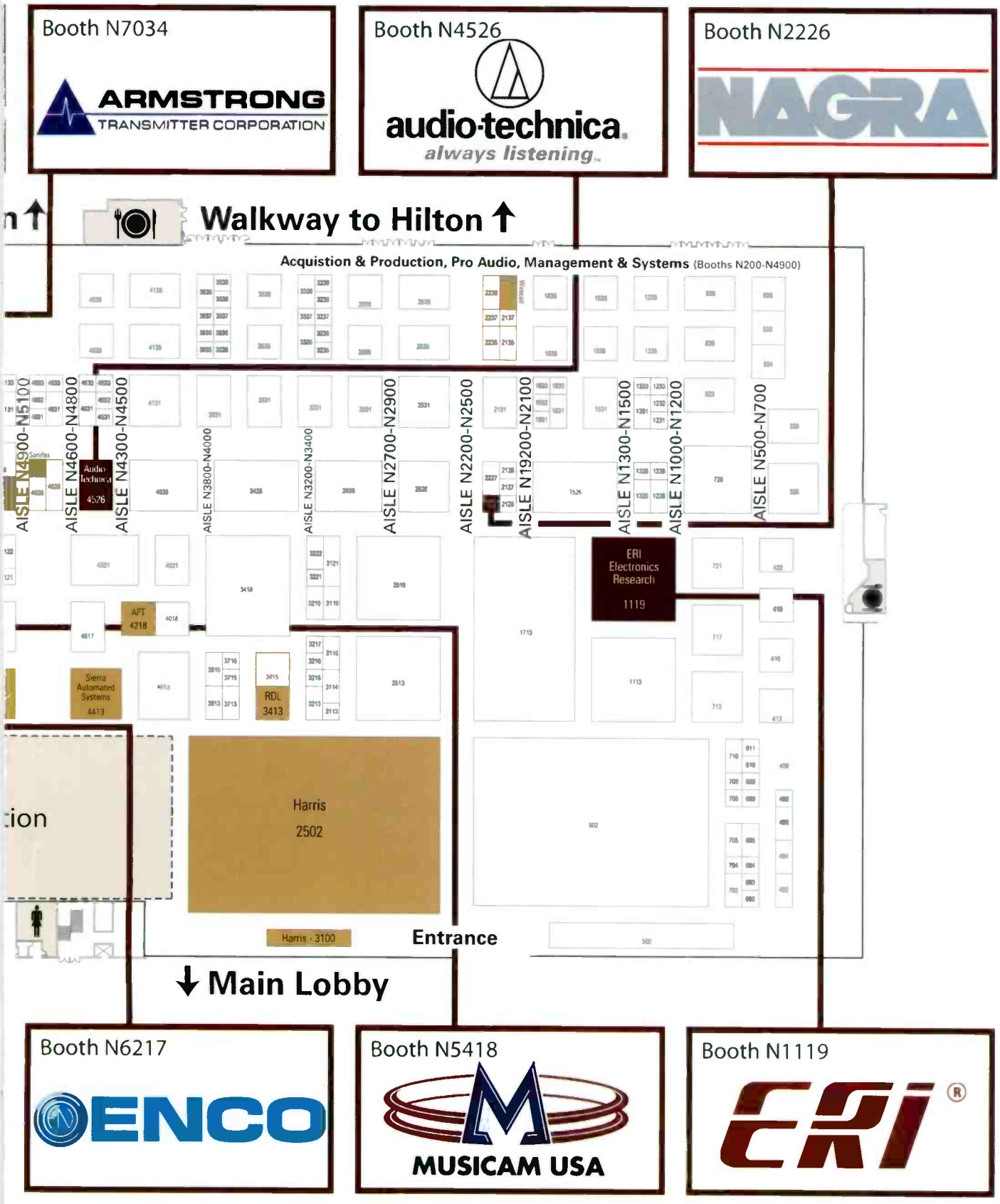

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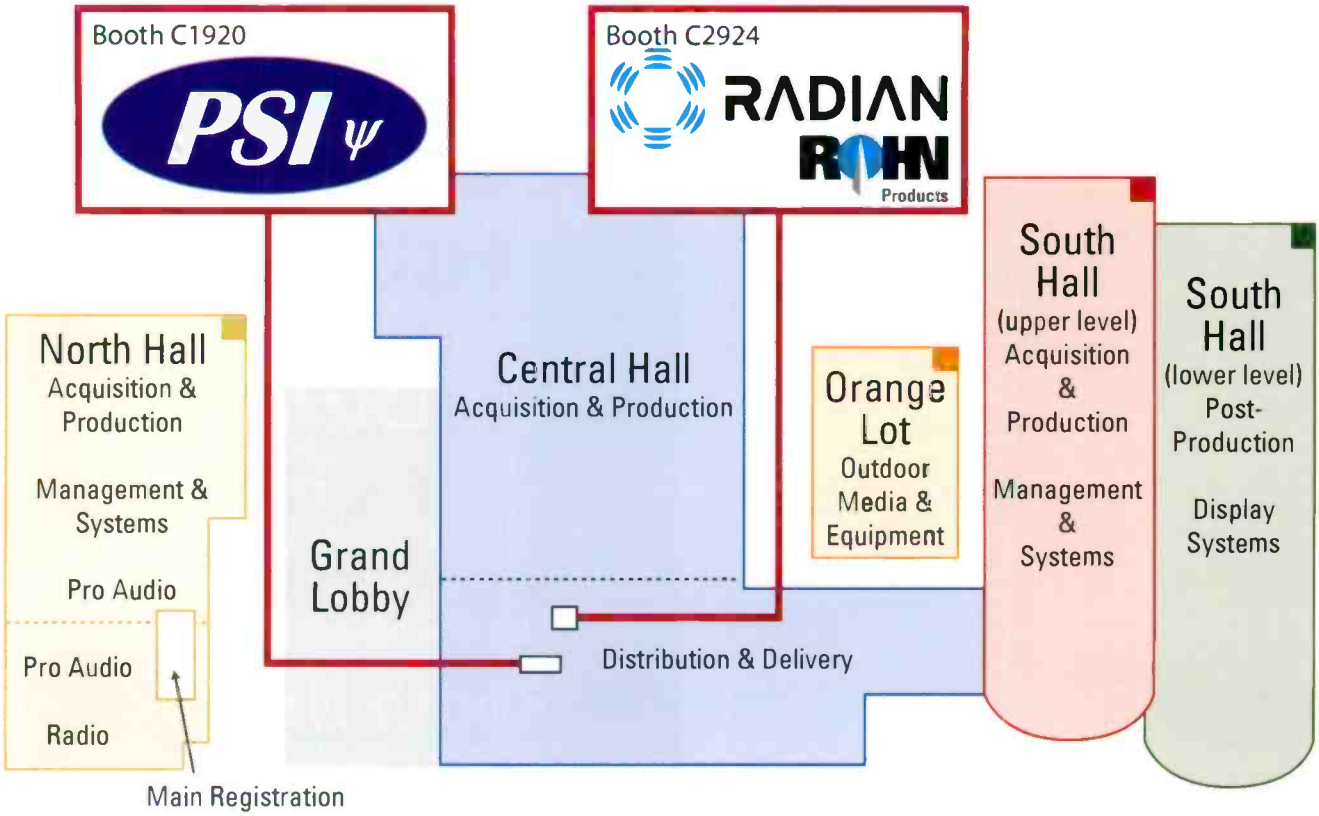

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Radio Hall map

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$1690

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NAB Extra!

Transmitter
PTEK
Booth N6126

1kW Transmitter: This transmitter is a single box 1kW transmitter with drop-down front panel for easy access to two replaceable 700W modules. The modular version will still be available.

888-889-2958; www.ptekpower.com
sales@ptekpower.com

Hand-held recorder
Nagra
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ARES-MII: The hand-held recorder and player records to a 2GB built-in memory, recording PCM mono or stereo, or MP2/MP3. USB2 offers a fast download time. The recorder is similar in size to an Ipod.

615-726-5191; www.nagraaudio.com; mail@nagra.com

Enhanced Radio Assist range
Netia Digital Audio
Booth N5721

Radio Assist 7.5 Upgrades: Netia has integrated its U-Share network management system into Radio-Assist 7.5 to automate the exchange of content for content distribution. The speech-to-text upgrade offers broadcasters content analysis and retrieval. By turning audio content into text the software helps identify and evaluate broadcast patterns. The Multitrack XT is designed for multitrack digital audio recording and editing. Finally, Radio-Assist 7.5 is now available bundled with customized Axia IP-Audio networking components that allow any audio workstation PC running Windows to send studio-grade audio directly to an Axia audio network from its network interface card.

866-638-4222; www.netia.net; j.martin@netia.net

On-air console
Audioarts Engineering
Booth N7111

+Air2: The new radio console is designed for small market stations, such as college radio and worships facilities, that are seeking high-end features such as: phone channel with TB, two stereo buses and separate control room/studio monitoring.

252-638-7000; www.wheatstone.com
sales@wheatstone.com

Portable broadcast mixer
JK Audio
Booth N9426

Remote Mix 4: A four-channel field mixer and headphone amplifier, this unit is a communications interface that features a phone line hybrid and keypad, a PBX handset interface and a 2.5mm cell phone interface. Use it as a phone line hybrid, calling into the studio talk show hybrid. Use it as a front-end mixer for a POTS, ISDN or IP codec. Features include four XLR mic jacks with phantom power, male XLR clean mixer output and four 1/4" headphone jacks with individual source selectors and level controls. The mixer is powered by dual 9V batteries and/or 100-240Vac external ac power supply.

800-552-8346
www.jkaudio.com; info@jkaudio.com

AES/EBU digital interface
Henry Engineering
Booth N7432

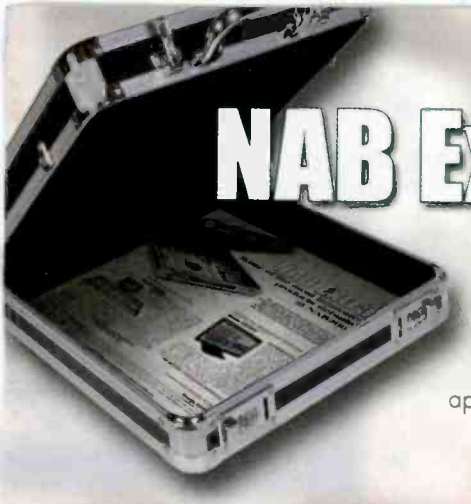
USB-AES Matchbox: This digital interface provides AES/EBU digital audio input and output from any PC or laptop computer via a USB port. The unit is used instead of a PC sound card, and is compatible with any digital recording, editing or automation software that supports USB. The interface features XLR input and output connectors for AES/EBU digital audio, as well as secondary analog outputs on the XLR connectors. The system supports 16-bit digital audio at sample rates up to 48kHz. The unit is USB powered.

626-355-3656
www.henryeng.com; info@henryeng.com

IP intercom
Barix Technology
Booth 8034

Annuncicom 100: This intercom can be deployed over a standard IP or Ethernet network infrastructure. It can connect directly to a PC or function autonomously with other Barix products. The device can connect to one of eight preset radio stations. It can also connect to an unlimited amount of stations in a point-to-multipoint configuration. Target stations can be addressed over a standard Web browser, contact input or a serial interface. Used within the standalone paging, emergency call and intercom system, the unit is equipped with an Ethernet interface and communicates over existing TCP/IP networks. All network-connected devices can be controlled from a central command station. Each device comes with its own integrated Web server that allows it to be configured over a standard Web browser.

866-815-0866; www.barix.com; info@barix.com



NAB Extra!

Interdigital bandpass filters

Shively Labs

Booth N7026

2604, 2612: These interdigital bandpass filters provide filtering in a footprint less than half the size of conventional bandpass filters. The 2604 is designed for use with transmitters up to 2.5kW and the 2612 for transmitters up to 10kW. Both are manufactured for use in HD Radio applications.

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ZENON MEDIA

Terminated mic snake

Holophone

Booth N6034

Side-winder 6: When used in combination with any of the microphones in the Holophone line the terminated mic snake encodes a 5.1 surround recording into a stereo recording. The accessory connects to the H4 Super Mini, multi-channel preamplifier, monitor and encoder with left and right outputs. Attached to the equipment is a 3' Monster Cable that terminates in six Neutrik six-pin XLR connectors. The Matrix encoded surround output created by the module can be transmitted, shared and processed via any surround infrastructure.

416-362-7790; www.holophone.com
info@holophone.com

Find the mic winner

January issue

Congratulations to

Theresa Swann

of Tusculum College Greeneville, TN.

Her name was drawn from the correct entries for the January issue. She won a Heil PR-20 mic from Transaudio Group.

The mic icon was in the B in the Ravens logo in the lower right corner.

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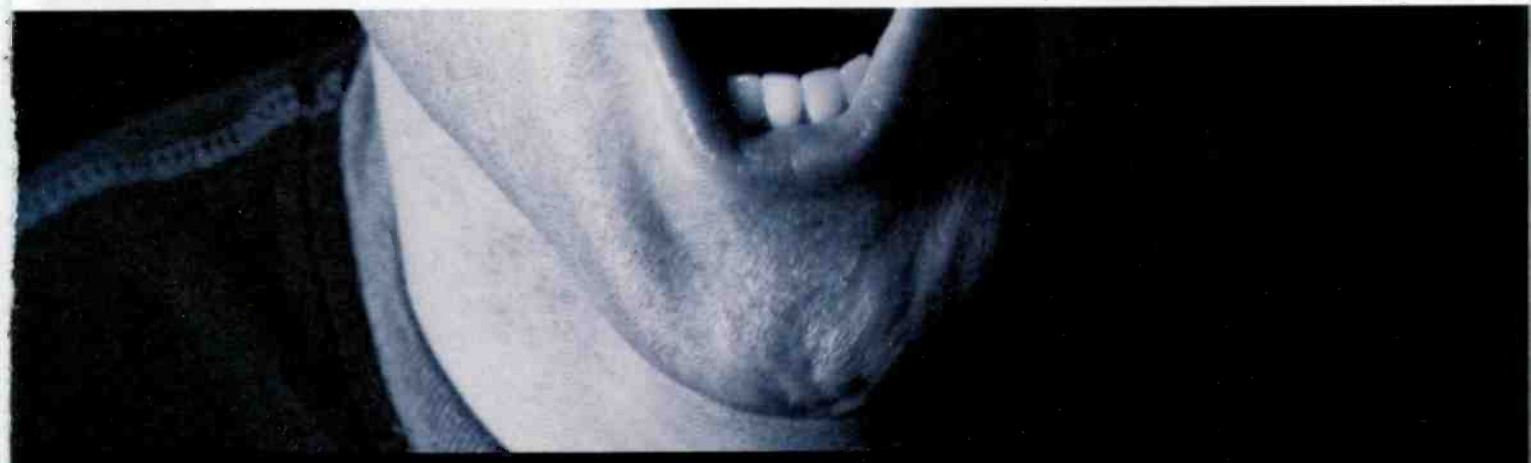

SOME WORDS SHOULD BE OBSCENE AND NOT HEARD

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.

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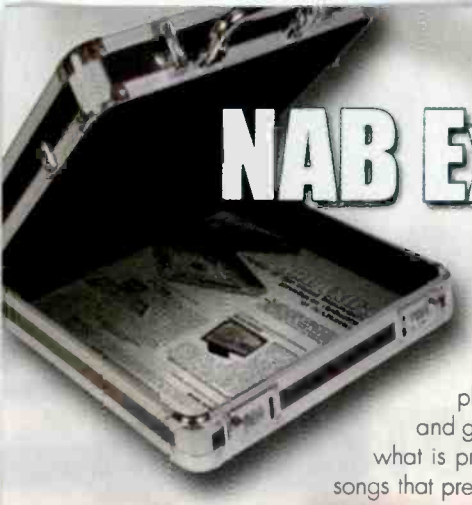
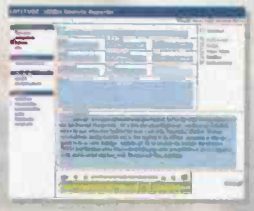
NAB Extra!



Automation system
D.A.V.I.D.
Booth N5431

Digasystem: The scheduling and play-out tools of this system can send text and graphics to the station's website to show what is presently playing on the air and the 10 songs that preceded it. The News Portal allows text, audio and graphics to be assembled into a story for view on the Internet. Listeners can browse through station audio to replay and download news stories, memorable program moments and full-length interviews. One-click and automatic podcasting is now possible. Remote Reporter allows users to access the database through a standard Web browser from anywhere. The EAS Listener manages alerts and sends notifications as pre-configured to do. The system now includes hundreds of Metadata fields.



888-374-3040; www.davidsystems.us
info@davidsystems.us

Portable receiver
Sennheiser Electronics
Booth N7117

EK 3241: This receiver is specifically designed for location sound recording. It improves on its predecessor, the EK 3041, by using a 36MHz switching bandwidth that is tunable in 5kHz increments to generate 7,200 frequency options. Weighing just over seven ounces, the receiver delivers between nine hours and 18 hours of continuous operation. Battery status is displayed in detail. The unit ships with 32 custom frequencies preprogrammed, and users can store another 20 frequencies in a user memory bank.

860-434-9190
www.sennheiserusa.com; lit@sennheiserusa.com

FM exciter
Superior Broadcast
Booth N8308

IBOC FM exciter: Superior Broadcast will debut a new IBOC FM exciter at the convention.

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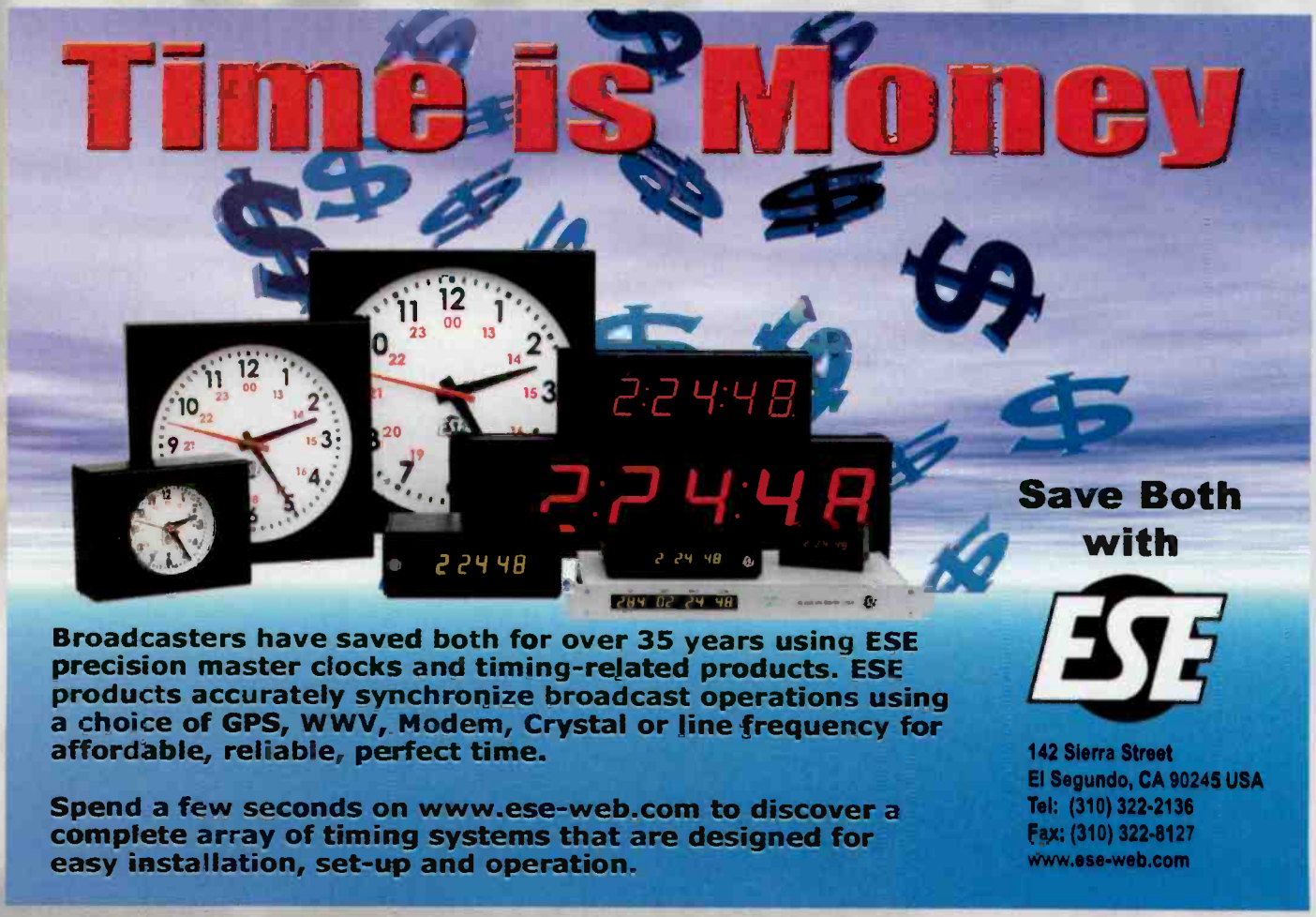

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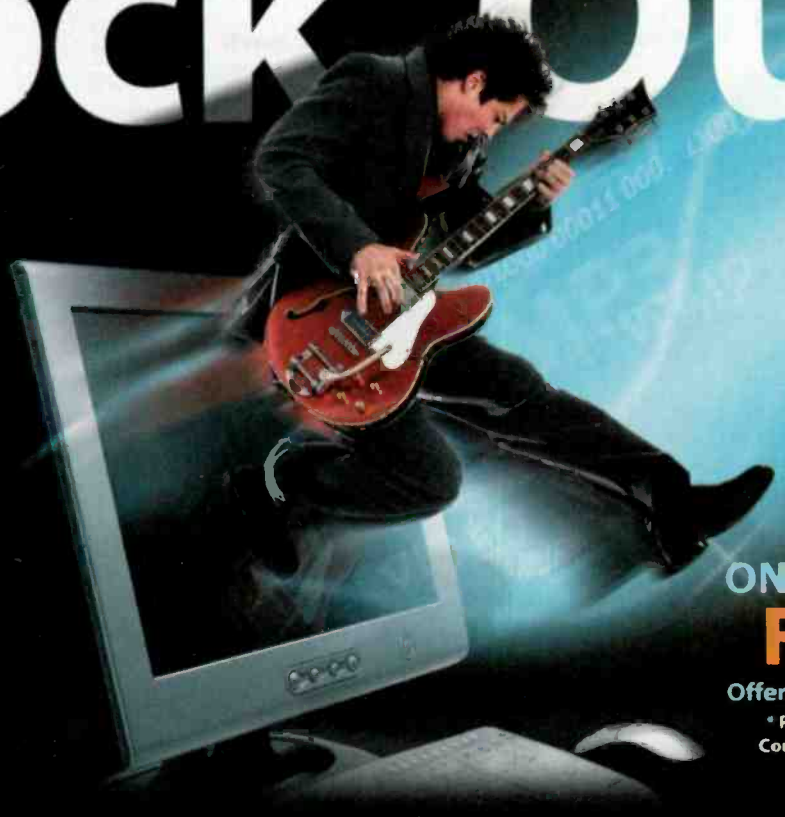

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Surround sound mixing system
Beyerdynamic
Booth N9014

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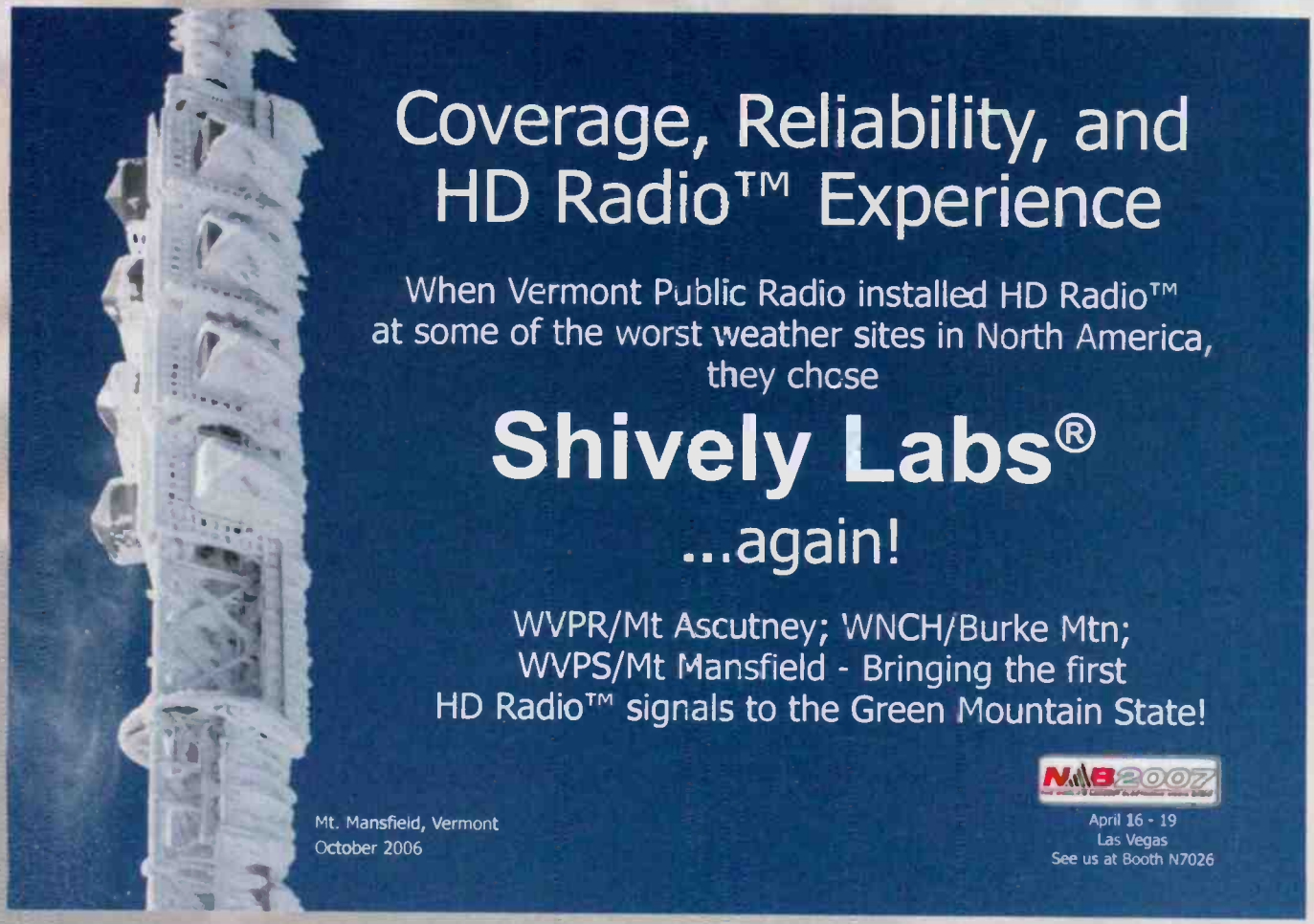
800-293-4463; www.beyerdynamic-usa.com
info@beyerdynamic-usa.com

Network management software
Axia Audio
Booth N7726

Iprobe: This utility is a network maintenance and diagnostics suite that makes managing, updating and remote-controlling an Axia system easier. The auto-documentation feature queries and documents configuration settings for every networked Axia device. The organizer tool lets users perform tasks such as gathering nodes into logical groups. The software works with any Axia IP-Audio network and runs on any P2-400MHz (or greater) PC, with 10/100 or 100/1000 Ethernet NIC running Windows 2000, XP or Vista.

216-241-7225; www.axiaaudio.com; inquiry@axiaaudio.com



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NAB Extra!

MPEG gateway
Telos Systems
Booth N7726

Zephyr Iport: Transport multiple channels of stereo audio across any network with T1 and T3 connections and MPLS networks with this system. The device incorporates eight stereo MPEG-AAC codecs in one box, converting linear PCM IP audio into compressed IP audio and back again. With a unit at each end of a T1 connection, stations can share audio between cities easily. The equipment uses the Livewire standard for networked audio over Ethernet, so users can connect it directly to an Axia IP audio network. A CAT-6 cable is all that's needed for eight channels of stereo I/O plus remote control. It works without the Axia network by pairing it with an Axia AES/EBU or Analog Audio Node for use as a standalone, high-density audio processor.

216-241-7225
www.telos-systems.com; telos-info@telos-systems.com

Console
Logitek
Booth N6521

Artisan: This flexible, modular control surface for the Logitek Digital Audio Engine, a modular X-Y router, offers a low-profile design. Multiple frame sizes are available to accomodate two to 30 faders along with two master mixes, eight sub mixes, four aux mixes, 24 mix-minus outputs and three monitor outputs. Surround processing is available on one master mix, one sub mix and one monitor out. Available modules include fader, monitor, master and effects. Two sizes of meter bridges are also available, along with the Vscreen software application, which allows the user to build full-screen meter banks as well as router controls. All parts in the surface are isolated from the ac mains power. The power supply includes 25 GPI in and 25 GPI out connections for external device interfacing.

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The *Radio* magazine Pick Hits are the top 15 new products of the convention as selected by the *Radio* magazine Pick Hits panel. Dating back to 1985, the Pick Hits are the original technology recognition.

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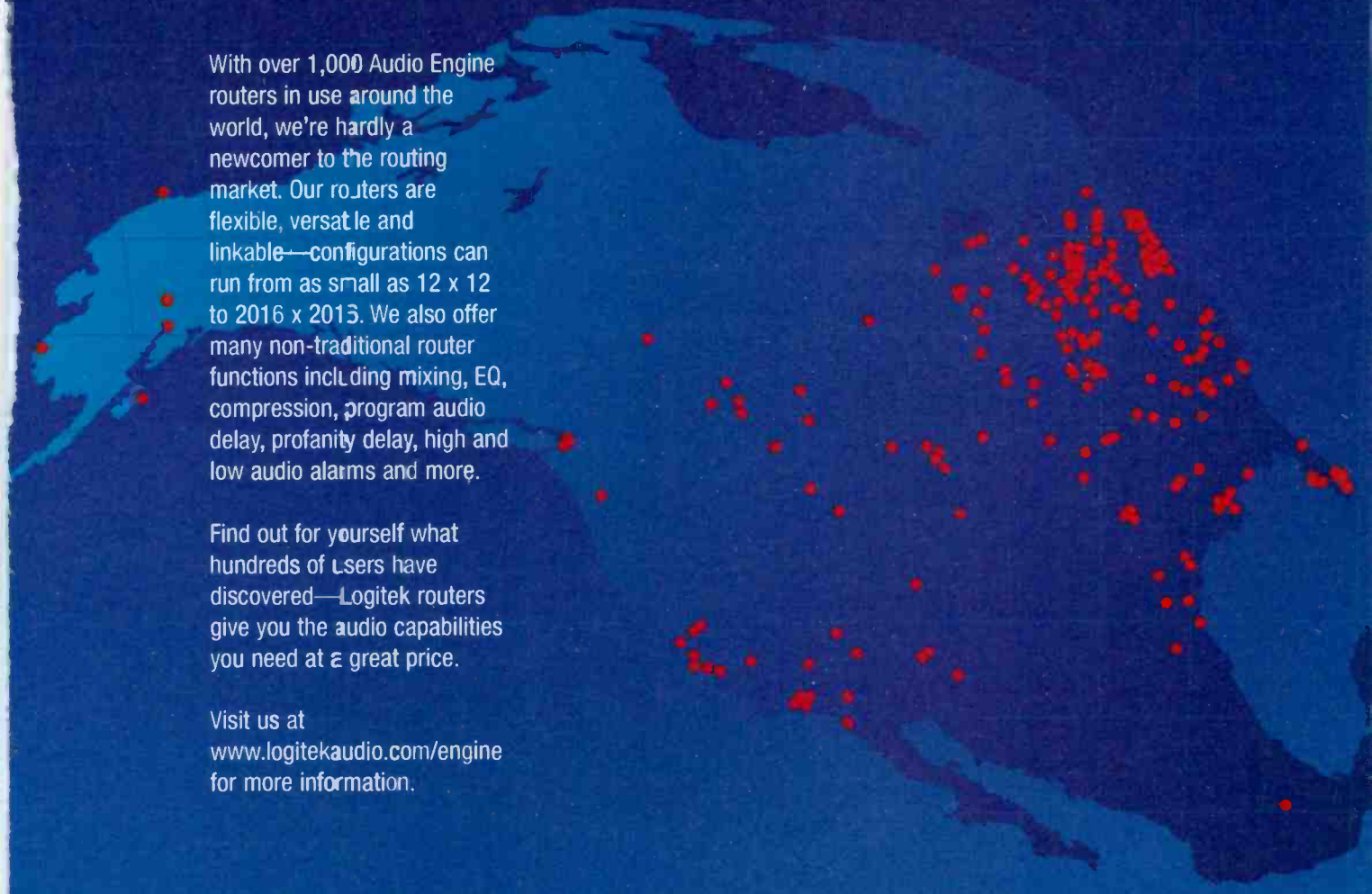

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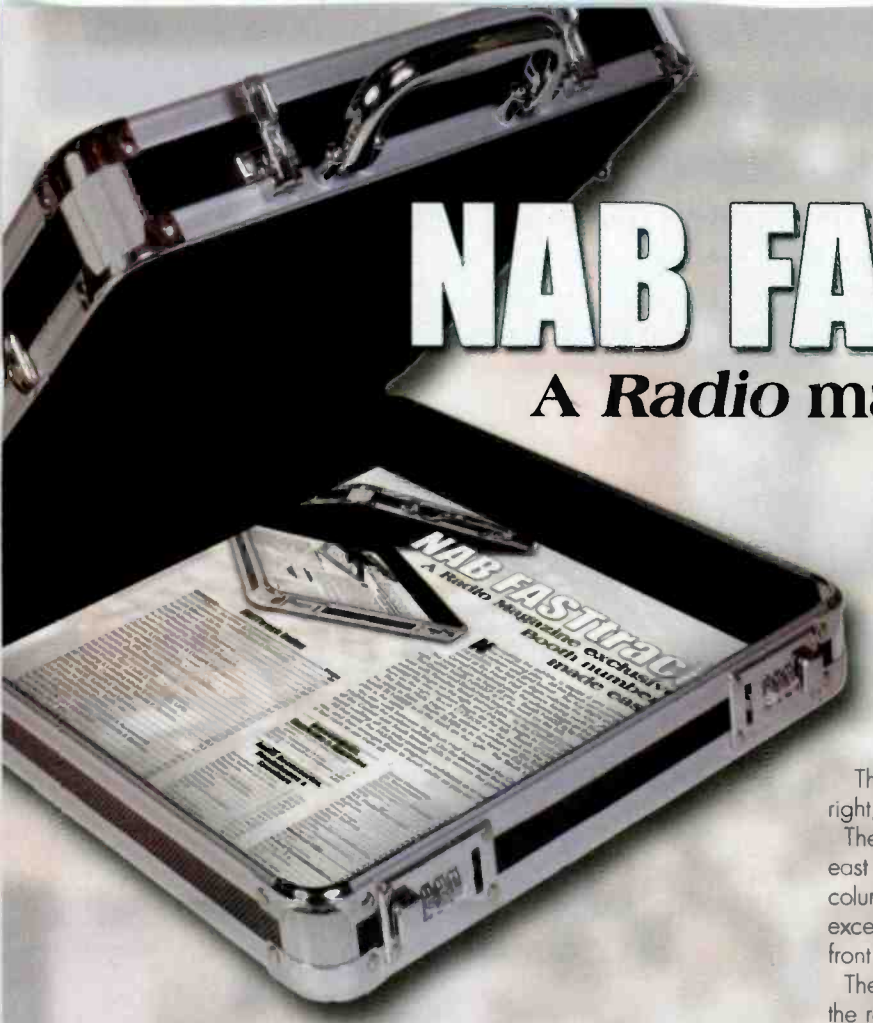
Console Router Systems



NAB FASTtrack

A *Radio* magazine exclusive
Booth numbers made easy

Navigating the exhibits is easier if you understand the numbering plan. All the booth are arranged in a column and grid format. The first digits indicate the column, the last two digits indicate the row. As you stand at the North Hall entrance facing north (with the Central Hall behind you), the columns begin on the right.

The rows begin in front of you. Booth N402 is to the front right, while booth N9437 is in the back on the left.

The Central and South Halls begin their numbering as you face east with Paradise Road behind you. In the Central Hall, the columns begin on the right, and the rows begin in front of you, except the row numbers begin on the left. Booth C158 is in front on the right. Booth C12200 is in the back on the left.

The South Halls begin the column numbers on the left and the rows in front. Booth SL106 is in the front on the left, and booth SL14020 is in the back on the right. The South Upper plan is the same.

You can walk between the South Hall Lower and the Central Hall through the outdoor exhibits. Use the doors near the middle of the Central and South Lower Halls to access the path and avoid walking all the way around.

All that said, the FASTtrack oragnizes exhibitors in to categories, and then arranges them in booth order so you can make a fast track to see them all.

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DK Technologies	N1835
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DPA Microphones	N2227
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TFT N6508
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Nexidia	SL 1413T
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Mackie	SL 9208
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Dielectric	C 1907
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Bridge Digital	N 705
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AMCC Storage	N1536
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Tascam	SL13910
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Drivesavers	SU13610
Quantum	SU13809

Microphones, Accessories

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DPA Microphones	N2227
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Audio-Technica	N4526
Avlex	N4631
Azden	N4826
Independent Audio/Sonifex	N4926
Sonifex	N4928
Holophone	N6034
Aphex Systems	***N6506***
Shure	N6921
Neumann	N7117
Sennheiser Electronic	***N7117***
Omnia Audio	***N7726***
Lectrosonics	N8116
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Middle Atlantic Products	SU 7826

Microwave, Fiber Optic & Telco Equipment

Diversified Marketing	C 1127
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Microwave Service Corp	C 1539
Kathrein, Scala Division	C 2213
OMB America	C 3324
Andrew	C 4946
Mayah Communications	C 8828B
Audio Video Technologies	C 8828E
Digidesign	C11606
Microwave Radio Comms	C2907
ADC/Nvision	N 721
SBS/Eddystone Broadcast	N2158
Harris	***N2502***
Tektronix	N2519
Opticomm	N2931
Harris	***N3100***
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NPR Satellite Services ..... C 7541
Dawnco ..... C 7841
Norsat International ..... C 8547
Broadcast Tools N6908
Patriot Antenna Systems OE103
Clear Channel Sat. Svcs OE320
Wegener Communications SU 7915
Scientific Atlanta ..... SU 9613

SCA & RBDS, Tuners and Monitors

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Dielectric ..... C 1907
Telex Communications ..... C 5329
Denon Electronics N1831
Harris N2502
Harris N3100
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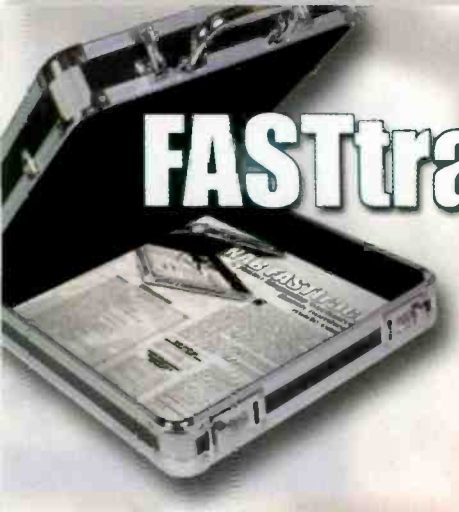

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Broadcast Warehouse	N7328
Broadcast Warehouse	N7330
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Burk Technology	***N8611***

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RadioTraffic.com	N5221
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Wideorbit	N5717
Prophet Systems Innovations	***N6511***
RCS	***N6511***
Wireready	N6808
LAN International	N7718
Bid4spots.com	N9134
Scheduall	SL 2308
Altermedia	SL10226
Xytech Systems	SU 7526

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Non-Stop Music Library	R206
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Sound Ideas	SL 7720
Groove Addicts	SL 7823
Killer Tracks	SL 8020
5 Alarm Music	SL 8024
615 Music Library	SL 8324
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Harris	***N3100***
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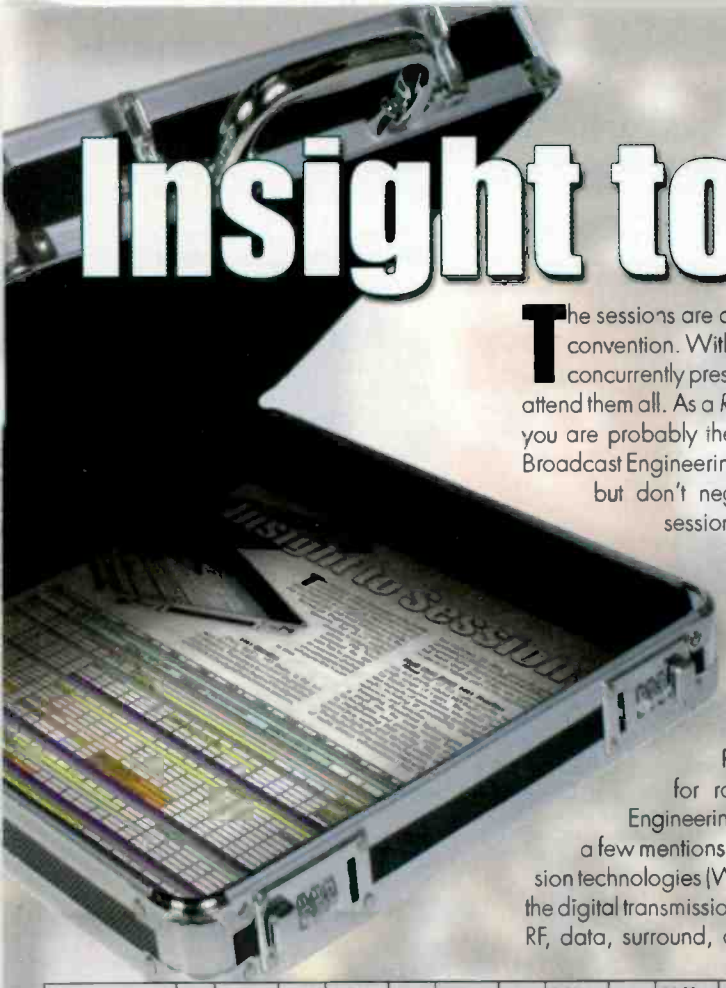
Insight to Sessions



The sessions are a major part of the NAB convention. With so many papers being concurrently presented, there's no way to attend them all. As a *Radio* magazine reader, you are probably the most interested in the Broadcast Engineering Conference sessions, but don't neglect other conference sessions. We have reviewed the session lists to provide an overview of items you don't want to miss.

HD Radio

Once again, HD Radio is the hot topic for radio in the Broadcast Engineering Conference. There are a few mentions of other digital transmission technologies (Worldspace and DRM) in the digital transmission sessions, but multicast, RF, data, surround, advanced services and station workflow for HD Radio are the prime focus. *Radio* magazine contributors Jeff Smith and Steve Fluker are among the moderators taking part in the sessions.

But not just HD Radio

About half of the radio-specific sessions are not strictly about HD Radio and cover a wide range of topics. The Audio Solutions for Radio session delves into several important aspects of maintaining audio quality for radio including IP, processing, digital data reduction and remotes.

Emerging Broadcast Technologies offers a peak into the most recent broadcast technologies and provides some solutions to implementing them today. This includes interactive radio and serving audio streams across multiple delivery mechanisms. The Radio Facilities session deals with issues of radio station infrastructure, from facility planning to audio networking to software management.

Room	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	noon	12:30	1:00	1:30
Saturday, April 14												
S219/220	Ennes Workshop - Everything Audio											
	Audio 101		101 Things You Should Know About Audio Wiring		The State of Broadcast Audio 2007	Dolby Broadcast Technologies		Building Broadcast Audio on IP				Audio for HDTV
Sunday April 15												
N234/236		Managing and Leading During Times of Change										
S219/220			BEC Keynote	February 2009								Transition to HD N
S226/227				Multicasting for Radio							RF Implementation for HD Radio	
Monday, April 16												
Hilton Barron			NAB2007 Opening Keynote									
S228						STL Bandwidth Requirements for HD Radio					Audio Solutions for Radio	
N232												
N234/236						Stay Out of Trouble with the FCC						
N235/237						Legally Speaking: All Things Radio						
N238/240											Building an HD Radio Station I	
N239/241												
Exhibit Floor			Exhibit Halls Open									
Tuesday, April 17												
Hilton Barron									Radio Luncheon			
S228			Radio Facilities									
S226/227											Broadcast Facility Safety & Compliance	
Hilton Ballroom B												
Hilton Ballroom D												
N238/240			Building an HD Radio Station II									
TBA	FCC Breakfast											
N234/236			Broadcast Ownership									
N232						Legal Advice for Small Market and Indy Stations						
Exhibit Floor			Exhibit Halls Open									
Wednesday, April 18												
Hilton Barron									Technology Luncheon			
S228			Surround Sound for Radio									
S226/227			Emerging Broadcast Technologies									
Hilton Ballroom												
N232			Tower Siting in a Newly Regulated World									
Exhibit Floor			Exhibit Halls Open									
Thursday, April 19												
S228			Radio Technology Advancements									
Exhibit Floor			Exhibit Halls Open									

Radio
TV
Radio and TV
General or Management
Regulatory
SBE
Exhibits

On Wednesday afternoon, the session titled Engineering Management for the 21st Century turns to the administrative side of broadcast engineering. Many engineers resist the management aspect of their jobs, but this session offers some practical insight into the modern technical workspace.

The last radio technical session is called Radio Technology Advancements, and it seems fitting that the Broadcast Engineering Conference should conclude with a look at the future of radio broadcasting.

Ennes Workshop

The Society of Broadcast Engineers will again present an Ennes Educational Workshop. Held all day on Saturday, this year's theme is Everything Audio. The session starts with an audio primer and moves on to audio wiring and IP audio systems. PBS is partnering with the SBE to present the session, and the afternoon portion shifts to a TV-oriented focus.

Regulatory issues

The Broadcast Regulatory and Legislative Conference has a full agenda of sessions, but there are several sessions that we think could be interesting to the media engineer or technology manager. These sessions include From Anxiety to Opportunity: Managing and Leading During Times of Change; Legally Speaking: All Things Radio; Stay Out of Trouble with the FCC: What Recent Enforcement Actions Mean to You; The FCC Breakfast; and Tower Siting in a Newly Regulated World. They all touch on various aspects of station operations. The FCC Breakfast itself is usually a good forum to hear directly from the FCC commissioners on the current activities of the FCC.

In addition, the session titled Legal Advice for Small Market and Independent Stations will provide some valuable advice for all stations. One of the featured panelists is *Radio* magazine legal contributor Harry Martin.

Plan ahead

Once on site, be sure to check the session guides for updates on times and locations for all the sessions. To help you plan your time now, the session timetable grid below highlights many of the sessions that will be of the most interest to you. Use this as a starting point when planning your schedule.

A remote remodel

By Doug Irwin

There are a couple of good reasons why radio stations execute remote broadcasts. First, it's a great way to interact with the local audience; and second, it can often be a nice revenue source for the station.

As the station engineer, you may be charged with determining the best way to execute remotes for the station. For our purposes, let's assume that you're putting together a brand new system without any legacy equipment. We'll focus primarily on 21st century techniques.

Wired vs. unwired

When setting up a system for remotes decide if with the wired route or the unwired route fits the application. This distinction is clouded somewhat with the wide availability of the public Internet, so there is quite a bit of crossover with some of the equipment that is available.

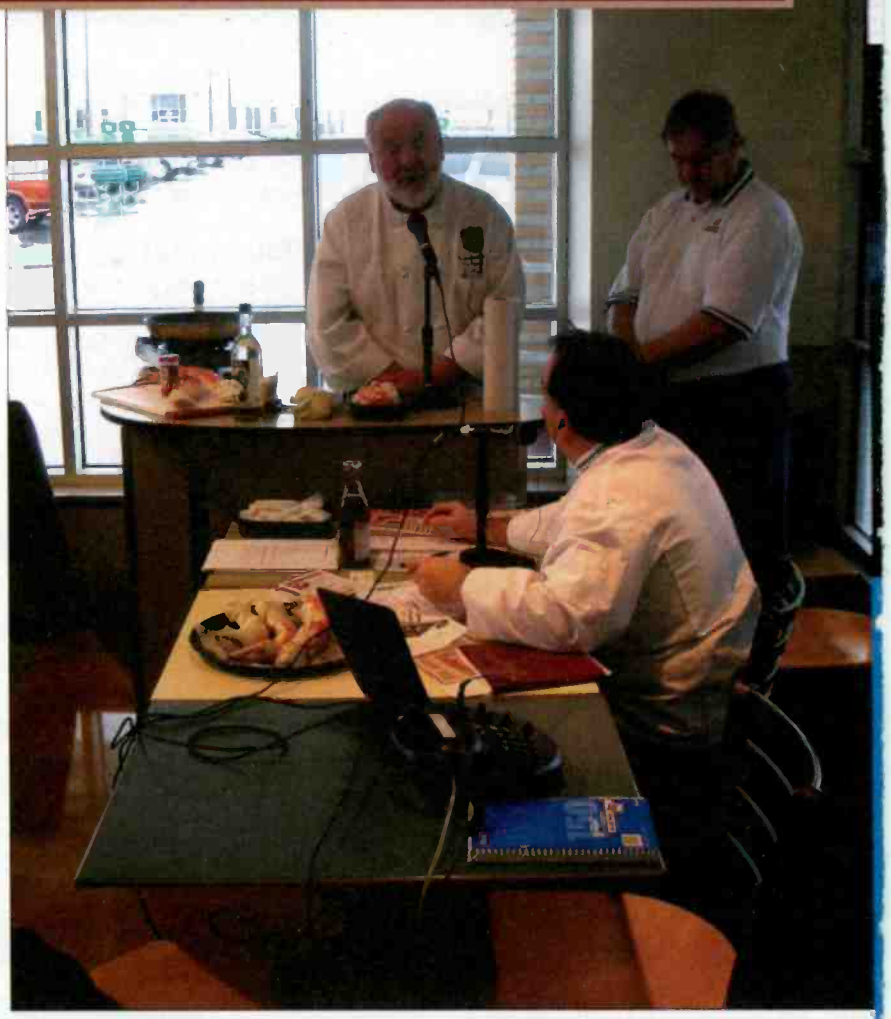
Generally speaking, the wired route is based on older technology. You could totally rely on the local telephone company to provide wire connections back to the station. In the old days you could order an 8kHz or 15kHz audio circuit. While they often worked well (and they often didn't) they always required a test visit before the day of the remote. The tariffs are usually quite high for this type of circuit, so unless you planned on originating multiple remotes from the same location, this type of wired circuit was not economical.

In the early 1990s, ISDN codecs became available and supplanted the dedicated audio circuits. While an ISDN circuit was often less expensive (not only for installation but also on a monthly basis) it had much in common with the older style of lines: the telephone company required a couple of weeks to install it, and it still needed to be tested ahead of the remote date. To a great extent, the quality of the remote broadcast audio depended on the codec itself and not the quality of the telephone company technician that installed the line. On the other hand the complexity of the ISDN codecs sometimes scuttled the remotes.

The unfortunate reality is that ISDN is now also obsolete; some telephone companies balk when the customer wants to place an ISDN order. The reason is pretty simple: There are better ways to get more data over a single copper pair, which means more money for them. Telephone service providers are inclined to spend their capital dollars on equipment that can handle these new methods, forsaking the older.

So what are you left with if you want to make use of wired circuits for remotes? POTS (though also becoming obsolete in its pure form) is ubiquitous so that is an option, and the Internet is readily available in many places because of DSL technology. Still, there are lots of options for wired connections.

Comrex has many years of experience in building equipment used to broadcast remotes over plain old telephone circuits and not surprisingly its current line includes all the features and functionality that you would expect. The Matrix codec field version has one mic-level input, one mic or line level input, a headphone output and a line-level out as well. The studio version is 1RU and does not have the mixer and headphone features. The Matrix uses an on-board POTS codec that can provide 15kHz of duplex audio response



Talk shows on remote are an ideal way to interact with listeners. Chef Jasper Mirablile (seated) talks with guest Chef Gary Puetz while Dennis Eversoll, CPBE CBNT, checks the setup on KCMO-AM Kansas City.

depending on the quality of the POTS connection. However, the user can also add modules to the Matrix such as the Portable ISDN module, the Matrix GSM module or the Matrix Telcell module.

Comrex also offers the Access, which takes advantage of the increasingly diverse set of connection possibilities: POTS, DSL, cable DSL (as well as 802.11x (Wi-fi), 3G data networks, high-speed cellular data networks). It uses the Comrex-developed Broadcast Reliable Internet Codec and will perform at several user-selectable quality levels. HE-AAC and AAC low-delay are also available for use over robust networks.

Tieline offers the I-mix G3, which is a complete remote broadcast package (mixer and headphone amp built-in). The basic unit is a POTS codec, but it has an expansion slot to plug in other types of codec modules. For example, a second POTS codec module can be added, giving the I-mix the capability of bonding two POTS lines together, providing mono, stereo or even dual-mono feeds of as much as 15kHz in audio bandwidth. Alternatively, the expansion slot can be loaded with Tieline's IP software module, allowing the unit to connect to wired LAN. (ISDN and GSM plug-in modules are available for the I-mix 3 as well.)

Musicam has its own codec that will work via IP: the Netstar. This device can send and receive audio, contact closures and ancillary data via TCP/IP, ISDN or dedicated data lines. It contains not only the standard algorithms such as G.711, G.722, MPEG Layer 2 and MPEG Layer 3, but also MPEG AAC and MPEG Layer 4 AAC-low delay. This unit can deliver uncompressed 20kHz audio with near-zero delay if the IP connection supports it.

Audio TX sells a software package called Communicator that allows the user to create a remote session via TCP/IP through physical connections such as a LAN, Wi-fi or DSL. The PC or laptop on which Communicator runs can also be turned in to an ISDN codec. The Windows software includes algorithms for MPEG Layer 2, Layer 3, G.722 and G.711, and can connect with other manufacturers' codecs.

The APT Tokyo is another full-featured, multiple algorithm codec that can be used over a LAN by way of Ethernet, or via its USB connector. In addition to MPEG Layers 2 and 3, G.711, G.722 and MPEG

Resource Guide

Manufacturers of remote broadcast equipment

AEQ
800-728-0536
www.aeqbroadcast.com

Allen Osborne Assoc.
805-495-8420
www.aoa-gps.com

APT (Audio Processing Technology)
800-955-APTX
www.aptx.com

ATA Audio
973-659-0555
www.ataaudio.com

Audio-Technica
330-686-2600
www.audio-technica.com

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AAC, it also includes the APT proprietary algorithms such as Standard Apt-x and Enhanced 16, 20 and 24-bit Apt-x. This device features a built-in inverse multiplexer that allows it to use four separate ISDN circuits, and hence provide up to a 512kb/s data rate.

The Orban Opticodec 7600 is a duplex audio codec for use via Ethernet, X.21 or V.35 interfaces, or as many as three ISDN interfaces or mixed with POTS interfaces. Configure and operate the codec directly with the front panel keypad and high-resolution graphical display.

A relatively new player is Mayah, and it recently introduced the Centauri II 3300/3301. This is a codec with multi-channel I/O. The bit rate is determined by the application and can be as low as 160kb/s with AAC+SBR (MPEG4 AAC HE) or as high as 6Mb/s with linear audio. Connectivity via IP and ISDN is possible.

Perhaps the best-known manufacturer of ISDN and POTS codecs is Telos Systems. The Zephyr Xport is a POTS codec that, with the inclusion of the field-installable ISDN option, can be made into an ISDN codec as well. The Xport uses AAC Plus audio coding for POTS connections; MPEG AAC low delay for ISDN connections made with an Xstream on the far end; and its G.722 option allows it to communicate with other G.722 codecs as well. The unit offers a built-in mixer with mic and line-level inputs, and independent headphone outputs that can listen to received audio or monitor mixes.

No wires

Perhaps you've decided that the wireless route is the one you would prefer. You could still choose from several of the codecs discussed above.

The Tieline I-mix 3, when equipped with the IP software module, can operate over a Wi-fi connection with the addition of a wireless media adapter connected directly to its LAN port.

Comrex uses the Access in a slightly different manner. The Access plugs into a laptop (or other PC) via an Ethernet crossover cable. Then, using Windows ICS, the Access shares the wireless Internet connection that the laptop makes—irrespective of the network type.

Now wait just a minute here. I'm kind of writing ISDN off, but even though remote pickup (RPU) technology is far older than ISDN I'm

Resource Guide *Continued*

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bringing it up anyway. With appropriate receive sites built in advance and an effective means by which the RPU audio can get back to the station's HQ RPU is really hard to beat—at the very least—in terms of its timeliness.

TFT offers the 8888 RPU transmitter and the 8889 RPU receiver. The system includes frequency-agility, selectable deviation on the transmitter (with 20W RF out) and selectable bandwidth on the receiver. The receiver can be controlled remotely and DTMF tones change the operating channel and IF bandwidth. The transmitter includes a built-in mixer with three mic- or line-level inputs; a send/return loop for connection to an external audio processor; a built-in peak limiter and a headphone output for monitoring the locally mixed audio.

Not to be outdone, Marti recently introduced a new RPU transmitter: the SRPT-30. This unit comes with two factory selectable frequencies, four front-panel mic level inputs (line level input available on D-connector on the back of the unit) going into its built-in mixer, and as much as 30W RF out. The SR-30 is the current model RPU receiver.

Conquering the delay issue

Whether you use one of the IP codecs or even ISDN, you will have to deal with the delay in the "round trip" time that the remote talent will experience. Unless you want the talent throwing the headphones down on the table (or maybe even at you) you'll have to send mix minus audio back to the remote site in some way. If you are transmitting HD Radio, then you have an additional eight-second delay to deal with. If you're doing a live show then you will be operating with a profanity delay in-line as well. The bottom line is that this is an issue that can't be ignored.

If you choose to go the wired route you will take advantage of the duplex nature of all POTS, TCP/IP (and ISDN) codecs. Develop a mix-minus at the station and feed it back to the remote site. If you choose the wireless Internet option, you can solve the problem in the same manner due to the duplex nature of the connection. If you want to go strictly wireless with RPU, then your problem is a bit more cumbersome.

First is the use of a phone coupler. Because the remote site isn't tethered, you'll likely use a cell phone to call this coupler, steal the receive audio from it somehow and mix that into the talent headphones. Sounds easy, right? There are a few challenges. Usually the connections aren't that reliable. You need to be within range of a cell, then you need to get a circuit, then it needs to remain connected. As anyone who has used a cell phone can tell you, none of those things are guaranteed. Oh yes, then there is the cost of the call itself.

Secondly, you can make use of an RPU channel to transmit the IFB

Resource Guide
Continued

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audio outbound to the remote site. This is convenient if you have the channel and the equipment and the site—all of which can be problematic. If the IFB transmitter is at the same location as the RPU receiver, then use the same RPU antenna with a duplexer to receive and transmit.

Thirdly, use some spectrum in the upper part of the FM baseband to transmit audio to the remote site. This obviously requires spare capacity on the studio-transmitter link to carry the IFB audio. This also requires the available subcarrier spectrum. A station that already has one or two SCAs could have some challenges. All this also assumes that there is an FM signal in the station group.

There are at least two manufacturers offering SCA generators; one is Broadcast Electronics. BE offers the FC-30, a 1RU device that lives at the transmitter site or back at the studio if carried on a 950MHz composite STL and operates between 33kHz and 95kHz. A 150 microsecond pre-emphasis setting is standard, but it can be set internally for 75 microseconds, which allows use of a legacy FM audio processor to drive its audio input.

Modulation Sciences offers the SCA-186, a 2RU device that includes the subcarrier generator, a built-in audio processor, a devia-

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While ISDN is becoming more difficult to obtain, it is still a reliable option.

tion meter and a transmitter tuning aid.

Now if someone just made an SSB SCA generator. This would eliminate the need to turn the SCA carrier off after the remote is done.

The last mile

Any one of these three methods requires some type of receiver at the remote setup location, whether it is a table top or the inside of a remote truck. How do you get the IFB audio to a talent roaming with a wireless mic? There are several wireless mic manufacturers that make IFB systems as well.

Lectrosonics offers the T4, a frequency-agile (operating on one of 256 UHF channels, in 100kHz steps) that transmits a 250mW signal. The receiver is the R1a and its receive frequency range complements the T4. It comes in the belt-pack form with a housing of machined aluminum, and sports as much as eight hours of battery life with an alkaline cell.

Shure offers several systems known as personal monitors that can be used for IFB service. The PSM 700 system is made up of the P7T transmitter and the P7R beltpack receiver. The transmitter occupies a half-width rack unit, even with its built-in power supply. The unit has an antenna connector, so the transmit antenna can be located away from the unit. The belt-pack receiver features LED indicators for power, low battery and RF reception. The system can operate in stereo mode.

Sennheiser also makes several systems that can be used as IFBs. The EW300IEMG2 operates on any one of 1,440 channels spread over five blocks in the UHF TV band. The transmitter can be rack mounted, includes audio input metering and radiates 30mW. The beltpack receiver uses an autoscan function to find the transmitter. The system can operate in stereo mode.

One little hint I will give is this: when building a remote truck, put the wireless mic receive antenna and the IFB transmit antenna on top of the mast. Make sure the coil running up the mast has the appropriate number of coaxial cables installed ahead of time.

Executing remote broadcasts has always been in the province of the engineering department. When building a new system, find the correct balance between functionality and ease of use. Having a nicely engineered and constructed remote system is a great way to make a good impression on air staff, programmers and clients—and goes a long way in getting them all to recognize you as the hero you know you are.

Irwin is the chief engineer of WKTU-FM, New York City.

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A foundation for the future

By Keith Stuhlmann

Ft. Myers Broadcast Company, a privately-held, family-owned broadcast business nestled in southwest Florida since 1940, and who established the first radio and TV stations in the market, recently put the finishing touches on a new transmission facility for its WINK-FM and WINK-DT stations serving the Ft. Myers -Naples market. In its most basic description, the project entailed the addition of a 40 feet by 60 feet space attached to an older, steel-framed transmission facility that still houses the WINK-TV analog and backup FM transmitters. But the story extends far beyond the basics into a highly complex project that begins at the base of a new cement building and rises to the top of a combined radio/TV tower 1,500 feet in the air.

The multi-year project began in September 2002 with a series of FCC filings that would ultimately preserve WINK-FM's full Class C status. Another regional station's request to increase power, if passed, would have reduced WINK's status to Class C-0. This would have made the station unlistenable near Marco Island, an Arbitron diary-keeping area that is financially important to the company.

Our June 2003 filing to preserve the station's Class C status eventually prevailed. The rulings would be central to a series of new antenna installations, older antenna modifications and choice of transmitters for the new transmission facility. Harris and Dielectric provided the new transmitters and antennas that have ultimately shaped the way we broadcast today and into the future.

The FCC has revised the Class C definition over the years. Originally, it was defined as a 100kW FM radiated at a height above 1,000 feet. The last revision requires that to preserve Class C status, the station must have a center of radiation at or near 1,500 feet. A lowered antenna position would place the station in the new Class C-0 status, reducing the station's protected coverage range. This means that fringe area listeners may lose the station's signal due to increased coverage from an adjacent or co-channel signal in a different location.

WINK's co-located TV operation proved advantageous over the course of the decision process. The TV/FM tower, standing at 1,519 feet, offered plenty of room and flexibility to implement unique antenna design strategies. We plotted the installation of a special stacked antenna directly after our 2003 filing. This would boost our FM center of radiation to 1,500 feet and also accommodate WINK-TV's DTV antenna.

The work on the new transmission facility was postponed when Hurricane Charley roared through the area in August 2004. Although our facility suffered no structural damage, the storm devastated homes and businesses in the southern part of Charlotte County, just north of Ft. Myers. Construction was halted as contractors worked to rebuild, so we turned our attention to building our HDTV studios and technical core.

Construction work

Construction of the transmission facility was reinitiated as contractors again became available. Nu-Cape Construction of Cape Coral, FL, and Christopher J. Lee Architects

"My Number One Codec Rental is Zephyr Xstream"

-Steve Kirsch, President Silver Lake Audio

Rack 'em and stack 'em! The Silver Lake Audio Crew pictured from left to right: Steve Kirsch, Ken Stiver, Kirby Micvac and Jay Shoemaker

"When ISDN equipment rentals began in the early 1990s, we started with an equal number of different companies' codecs. Today, Silver Lake has over 100 Zephyrs in stock, ten times more than any other brand." says Steve Kirsch, owner of Silver Lake Audio.

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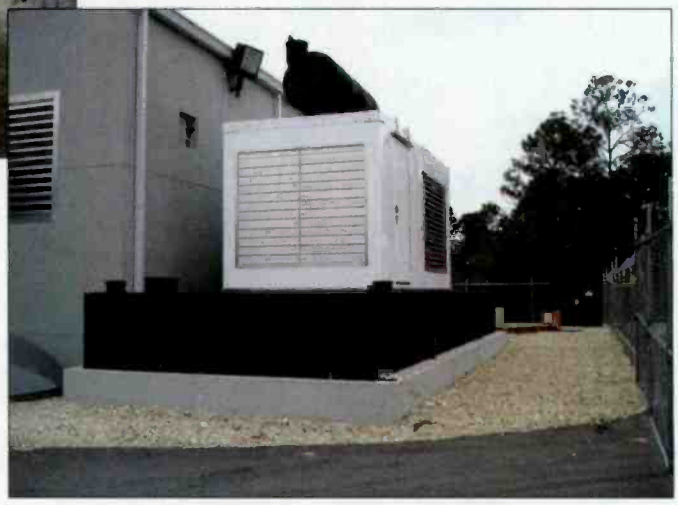
A foundation for the future

of Ft. Myers assisted with facility construction and design. The new section of the transmission facility is essentially a giant bomb shelter; a 40 by 60 bunker-style cement block with a poured cement roof. The result is a completely hurricane-proof construction encompassing enough electrical, ac and transmission redundancy to ensure that all broadcast properties on site will remain on-air at all times outside of complete devastation.



Above: A view of the old building with the new 40'x60' wing. Right: The Caterpillar 3412 diesel-power generator serves as backup for the new wing.

Plans for accommodating the appropriate antenna systems for WINK-FM, WINK-TV, WINK-DT and future transmissions (such as HD Radio) remained consistent throughout the weather-related construction delays. These plans were set into motion as construction moved forward.

Antenna installations and modifications were complex and versatile: first, the installation of a stacked antenna designed by Dielectric consisting of a TDM-5FM antenna on top with a TW-6B9 TV antenna on the bottom. This accommodated WINK-DT terrestrial Channel 9 while preserving the Class C status for WINK-FM.

Second, a new eight-bay side-mounted Dielectric antenna was installed for WINK-TV terrestrial Channel 11. This antenna, a broadband system covering Channels 9 through 11, will automatically become the backup DTV antenna when the FCC-mandated analog TV shut-off date arrives on Feb. 17, 2009.

The old top-mounted Channel 11 antenna was removed, and the 10-bay ERI rototiller antenna that previously sidemounted near the top of the tower was lowered 100 feet and retained as a backup for WINK-FM. This antenna was lowered to its new position to remove it from the aperture of the new side-mounted Channel 9-11 TV antenna.

The new Dielectric antenna had a significant effect on our choice of FM transmitter. The older 10-bay antenna, with its high antenna gain, required only 25.5kW of transmitter power output. Dielectric's stacked, five-bay design prevented us from exceeding the FAA's ceiling height of 1,519 feet. It also changed our transmitter output requirement to 54.2kW because at only five bays the antenna gain was reduced. This led to our choice of a Harris HTD-60CD FM transmitter as the new main WINK-FM transmitter.

Ft. Myers Broadcasting has been a Harris transmission

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customer for TV and radio for a long time. The previous main WINK-FM transmitter, a Harris HT-25CD, is now in backup mode transmitting over the ERI antenna. (WINK-FM's previous backup, a Continental Electronics transmitter, remains installed in the older transmission facility with the HT-25 and several NEC and Harris TV transmitters for analog Channel 11.) WINK-DT recently went on the air with a Harris Platinum PTCD20P2 solid-state digital VHF transmitter in the new transmission facility. Meanwhile, several other regional Ft. Myers Broadcasting and Meridian Broadcasting properties—all engineered by Ft. Myers Broadcasting under a joint agreement—operate Harris FM and AM transmitters.

The HTD-60CD is effectively two 30kW transmitters running in parallel into a Harris-engineered switchless combiner. Dual exciter designs are incorporated into each side of the transmitter. The main exciter drives each transmitter with automatic switchover to the backup to continue operating at the same power in the event of failure or maintenance. The same design was used in the Platinum DTV transmitter via the Harris Apex digital ATSC exciter. The Harris Digit CD is used for all of our analog Harris transmitters.

The tube design of the HTD-60 is the same as most of our older Harris transmitters. The HTD-60 maintains much of the same cavity design as its older siblings, but uses an improved power supply, drawing less electrical current and offering a more stable product overall. The PAs and IPAs remain singular to each transmitter, which allows us to take one offline and remain on the air with relatively strong signal coverage throughout the area. The HTD-60 also gets high marks for providing several monitoring points for standard remote controls, and offering a wide array of status readings for control and monitoring.

The switchless combiner, responsible for forwarding power from both transmitters into the transmission line and RF system, ensures that the station drops to only half-power if a transmitter is taken down for maintenance or other reasons. Without the combiner, the output drops to quarter-power. The drop to half-power means that only fringe-area listeners are affected. The HT-25 can provide close to full regional coverage in drastic situations, even though the ERI antenna is now positioned lower on the tower.

A rear view of the support racks for the WINK-FM and WINK-DT transmitters.

High beams

The multiple changes and modifications to the tower between antennas and transmission line required a significant amount of tower strengthening prior to installation. Tower Innovations engineered the tower strengthening project, which required heavier cross members in certain areas and additional plates on older cross members to support the weight of the new and old antennas and associated transmission line. Tower Innovations provided the cross members and plates, with Dielectric providing the transmission line.

The new portion of the transmission facility spans about two stories from floor to ceiling. This left plenty of space above the transmitters for the line to shoot up and across the ceiling to the exit port, where it continues outside and to the tower bridge. A 6 1/8" transmission line was used to handle the 54kW TPO for the WINK-FM transmitter, along with 3 1/8" line for DTV transmission. This added quite a bit of weight to the existing 6 1/8" analog TV line and 3 1/8" FM line for the HT-25 transmitter.

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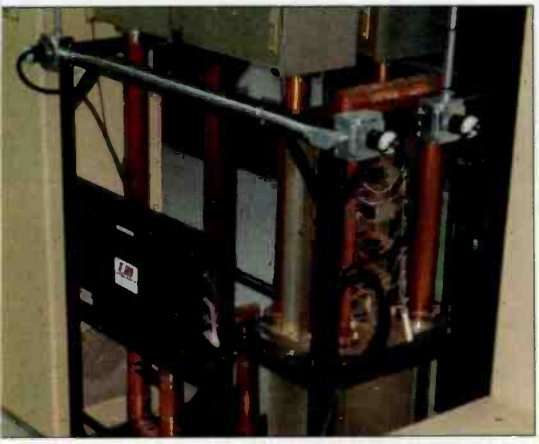
A foundation for the future

While built as a standalone entity, the new transmission facility, is separated by a double door entry that allows engineers to move between the new and old rooms. With no room to squeeze a new transmitter, the 2009 shut-off date for analog TV means that all main transmission systems will operate out of the new section. To further emphasize the separate entity feel, each side features its own electrical system, cooling system, transformer and generator.

The original part of the transmitter site uses a diesel-powered generator for backup that came in handy for Hurricane Charley. The new side adds a giant UPS for the new WINK-DT and FM transmitters. A second diesel power generator was installed in February 2007; the HT-25 can also be switched on using the older diesel generator if necessary.

This area is cooled through two redundant Liebert ac units that operate on weekly alternating cycles to preserve the life of the units. One unit can handle the heat loads from the DTV and FM transmitters. A large, mounted exhaust fan and two air louvers were incorporated into the building design in the event of total ac failure. The fan automatically starts if the temperature climbs above the set degree, and the louvers automatically open to exhaust heat from the room and keep the transmitters in operating condition. The room normally operates as a closed system.

This additional failsafe cooling procedure was added due to an experience at another transmission facility that had a total ac failure from the Hurricane Charley power outage. The temperature in the transmitter room exceeded 130° on the engineer's arrival, and the transmitters shut



The combiner network combines the output of the two 30kW transmitters to produce the 60kW output.

An overhead view of the HTD60 FM transmitter.

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Harris HTD60 transmitter, Digit CD, switchless combiner
Inovonics modulation monitors
Liebert ac units
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Tower Innovations crossbars and plates

down as a result of the heat. Similarly, four by four glass blocks were incorporated into the design. These blocks line the ceiling and walls, and allow engineers to work by sunlight rather than flashlight in the event of power failure.

The electrical system is designed so everything comes into the new side of the building at 480V and is then stepped down to address various electrical requirements. The transmitters run on less but the tower elevator requires the higher voltage. This also provides extra capacity for WINK-FM's future HD Radio transmitter, which will require a separate antenna. Electrical and floor space is also mapped out for a second DTV transmitter when the current Platinum transmitter moves to backup status. These considerations ensure that we'll never run out of electrical capacity or real estate for future transmission and RF systems for antennas.

The facility also is designed to remain clean, as it does not take in any outside air. The closed ac system eliminates bugs and debris. This all adds up to easier transmitter maintenance. The Harris transmitters require limited maintenance; keeping filters clean of dirt and dust, and paying attention to temperature and discoloration in the wiring jackets are the big issues. The HTD-60 allows us to take down one 30kW transmitter, inspect and clean it, and put it back online before repeating the same steps with the second transmitter. This is far easier than the hard switchover of the older transmitters (for which we also run weekly test loads for maintenance purposes).

Transmitter rack equipment is limited mostly to modulation monitoring, with units provided by Inovonics. An ATI distribution amplifier splits the signal to ensure it feeds the HT-25 in the older building. As we prepare for HD Radio, STL upgrades and additional monitoring and processing equipment will certainly be needed. For now, four years of FCC filings, antenna adjustments, tower strengthening and RF design work has paid off nicely. The new DTV transmitter went on the air on May 30, 2006, with the WINK-FM HTD-60 transmitter following on July 17—with plans in place for future expansion.

Stuhlmann is the director of engineering of Ft. Myers Broadcasting Company and Meridian Broadcasting, Ft. Myers, FL.

Online Extra

Additional photos of the WINK facility are posted with this article online at beradio.com.

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politician's speech or remove unneeded portions of a large file to save storage space. It is not a full-featured editing system. The graphical representation of the WAV file can be magnified for precise cutting. In and out points are selected by pressing a button or by inputting time code.

Some operating controls and connections are placed on the sides of the recorder.

The File/Folder Manager works like Windows Explorer, allowing you to create or rename directories and move files among them. The PAW 120's memory is formatted in standard FAT, making the recorder a plug-and-play utility on Windows or Apple machines.

For all its advantages, there are a few quirks: Printed documentation is thin, somewhat vague and printed in tiny type. The website for firmware updates, www.paw-recorder.com, is still in Chinese only, months after the unit's U.S. release, making a mystery of its links for those of us who do not read Chinese.

The PAW 120 is formatted in standard FAT, making the recorder a plug-and-play utility.

Carrying the recorder around in my hand while it is turned off, I constantly seem to hit several secret combinations of buttons that launch Chinese-language routines. I've not been able to exit any of them without opening the battery hatch and momentarily removing a battery. I could remember to engage the hold switch, which locks the keyboard, to prevent this—but it is weirdly annoying.

The PAW 120 originally displayed in English or Chinese. Through a firmware update in early November it has added Spanish to the mix. This firmware update also reprogrammed, among other things, search function controls for greater ease in navigating audio files. Apparently, AEQ is listening to end users and will update the PAW 120's operating software as the recorder gains real-world experience, a philosophy all too rare these days.

Linder is an investigative reporter for KNX Newsradio, Los Angeles.

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Aphex Model 230

By Bill Eisenhamer

It was time for KSON and KIFM in San Diego to embrace the digital age of HD Radio. In this march forward, we needed new, simple microphone processing that meshed with our new digital console and air chain. After many listening tests, we selected a processor that had the warmth of old and integrated with the new digital of today: the Aphex 230 voice processor.

Installation of the 230 is straightforward. The rear panel features an XLR mic input with a graphic warning of the potential of 48V phantom power. Next to the mic input is an effects loop, which is not normally used in a broadcast environment. The send and return are both ¼" balanced TRS jacks labeled for 0dBu. There are two line outputs: a male XLR +4dBu and a ¼" TRS phone jack that is run unbalanced -10dBV. Both outputs can be used simultaneously if the need arises. There is also a ¼" TS cough switch jack if needed.

The rest of the rear panel is dedicated to digital. There are three digital outputs: An XLR AES, a coaxial RCA S/PDIF and an optical TOS output. Beside the output jacks are two switches that choose the sample rate. The first switch designates 44.1kHz or 48kHz sample rate while the second switch is a multiplier being one or two. Thus, in addition to the 44.1kHz and 48kHz it provides 88.2kHz or 96kHz sample rates. In our facility 44.1kHz is the house rate. These are the internal sample rates. If you prefer to use a central word clock you have that option. Choose the switch for internal or external clock, and if you use an external clock you have BNC connectors for word clock in and out. The 230 will sync to frequencies between 32kHz to 96kHz.

Performance at a glance

Low-noise RPA tube mic preamplifier

Logic Assisted gate

Includes Big Bottom bass enhancer and Aural Exciter

High-resolution 24/96 A/D converter

The front panel is loaded with the controls of the processor. All switches and knobs are logically located making it easy to visualize the flow of the signal. A power switch is provided on the front, which I find useful in situations when access to the back is difficult. The switches for low cut, 48V phantom power, polarity, the phase rotator and a 20dB pad are at your fingertips. A switch is provided to engage the compressor. With a single switch you can turn on the equalization processing of the Big Bottom, the parametric EQ and the Aural Exciter. There is no switch to engage/disengage each effect, nor does the gate or de-esser, but the de-esser is essentially shut off by setting the threshold to +24dB.

Delving deeper

The first stage comprises the RPA tube preamp and the Easyrider compressor. The tube used is a 12AT7/ECC81 dual triode. Input control is the combination gain and drive that sets the gain of the preamp and the drive to the compressor. This is graduated from 20 to 70. The release knob, with a range from slow to fast, controls the density of the compressor. With the proper combination of gain/drive and release, the compressor is smooth and controls the levels well. I opted for a middle-release level. To monitor the amount of gain reduction there is the dual purpose LED meter. A switch is used to view VU or gain reduction.

Following the compressor is the gate. Unlike many gates, this is the patented Logic Assisted Gate. I tried many different settings. I could not get this gate to chatter; a problem we had with our older microphone processors. With this gate all you set is the threshold and depth controls. The threshold ranges from -40dB to 0dB and the depth can be set between -2dB and -65dB. If the depth control is set too deep you get the noise on/noise off sound that I dislike in gates. This can be avoided by seting the depth to no more than 12 o'clock—around 6dB.

The other unique stage is the equalization stage that follows the gate and de-esser. Unlike traditional parametric equalizers with level and bandwidth controls for three bands, you are presented with the Big Bottom bass enhancer, a parametric EQ and the Aural Exciter. Even if you are not fans of these controls, I found that with a little play and minor adjustments they work better than a basic equalizer. The Big Bottom is set with a tune knob and a mix knob, likewise the Aural Exciter. The Big Bottom frequency tuning range is from 80Hz to 300Hz, and the Aural Exciter has a range between 600Hz and 6kHz. Both feature mix controls that range from zero to max.

The parametric EQ came in handy to smooth out any annoying frequencies with its frequency control, Q (bandwidth) control and gain control.

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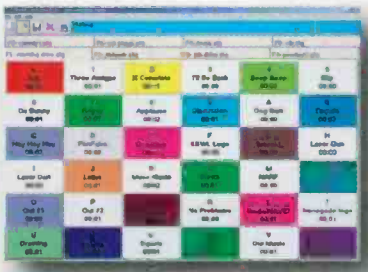

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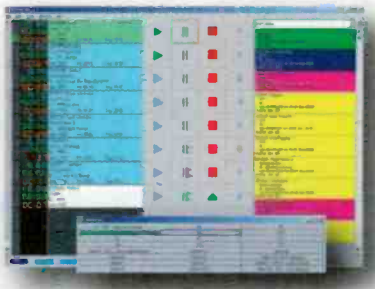

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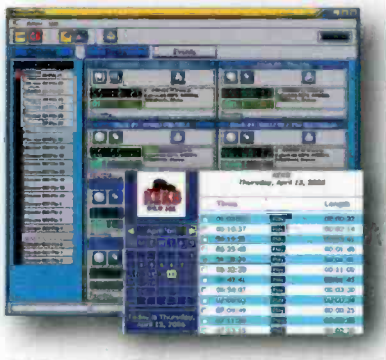

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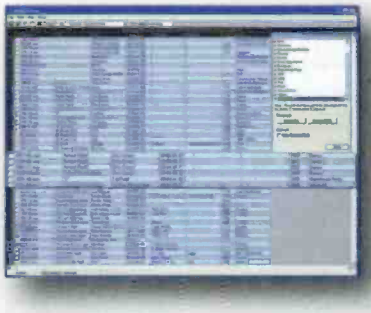

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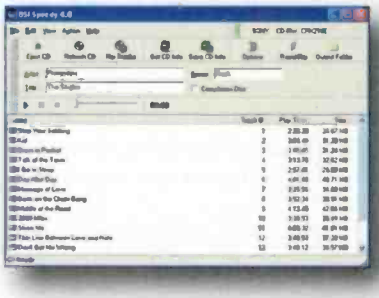

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BSI

The frequency range is from 240Hz to 4.5kHz, the bandwidth ranges from .5 (broad) to 5 (narrow), and the gain, or peak/dip, ranges from -12dB to +12dB. I ended up dipping a moderately wide bandwidth for the room, which allows the voice to be more natural.

This is a new installation, and I have not run into any maintenance issues. One concern I had was installing a tube-based device. According to Aphex, the patented tube circuit has been in thousands of units for more than a decade with fewer than a handful of failures. Even if I had to change a tube, it would be a small price to pay for maintaining a unique and quality sound. At the same time, when deciding where to place this unit, or multiple units for that matter, there is a heat load to be aware of. My units are enclosed in racks that provide sufficient ambient air flow. To help maintain the free flow of air I installed vented rack panels above and below each unit. As for doing any maintenance on the 230, there is no schematic provided, and if the unit is in bad shape you need to send it to the manufacturer.

I find the Aphex 230 to be a great addition to our air chain. My basic requirements were met when I was able to get a quality microphone processor with a digital output. The performance of these units over the past year has been quite good. The price was competitive, too. There is always a risk when you are one of the first to use a piece of equipment, but I felt confident that this one would work. It has.

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> Even if I had to change a tube, it would be a small price to pay for maintaining a unique and quality sound.

Eisenhamer is the staff engineer for Lincoln Financial Media in San Diego.

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The FlexPhones Master is equipped with inputs for stereo program and talkback audio. Rear panel program and talkback trimmers are provided to pre-set maximum input levels. The microphone/line level talkback input is available via a rear panel plug-in euroblock connector, while the front panel XLR connector facilitates the use of a user-provided gooseneck microphone or headset. The front panel is equipped with a level control for local headphones with both 1/4" and 1/8" stereo headphone jacks. The six front panel talkback switches allow the user to independently communicate with each AHR-1 listener and can be configured to insert talkback audio into only the left or both ears and dim either or both program channels. Any combination of switches may be pressed, while the "All-Call" interrupts all listeners. The Talkback function can be remotely controlled. Six RJ45 jacks are provided to distribute audio and power via CAT5 cable to the AHR-1's, which conform to the Studio Hub format. Low-Z balanced audio distribution is used to preclude audio degradation with long cable runs.

AHR-1 Active Headphone Remote

The Active Headphone Remote (AHR-1) contains a stereo amplifier designed to work with any combination of high-efficiency headphones with impedances between 24 and 600 ohms. The AHR-1 is equipped with 1/8" and 1/4" headphone jacks, level control, user-configured utility momentary pushbutton and LED indicator. Two rear panel RJ45 jacks are provided for connection via CAT5 cable to the FlexPhones Master. The AHR-1 may be desktop mounted, under counter or with the optional HR-1/MP or HR-1/MP-XLR mounting plates, which may be turret or counter-top mounted.

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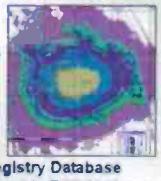

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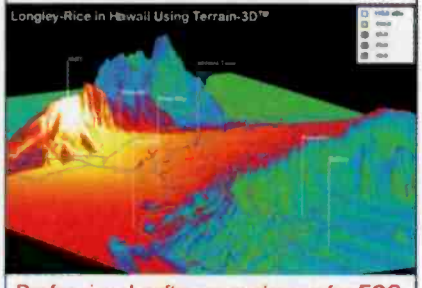

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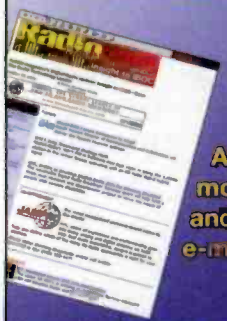

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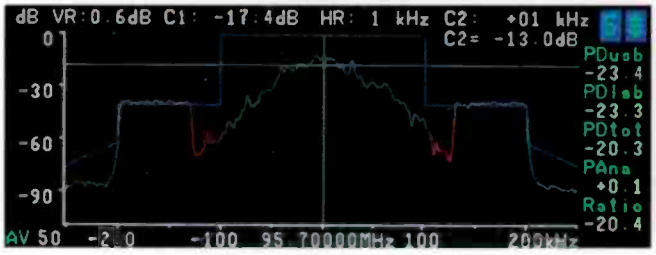

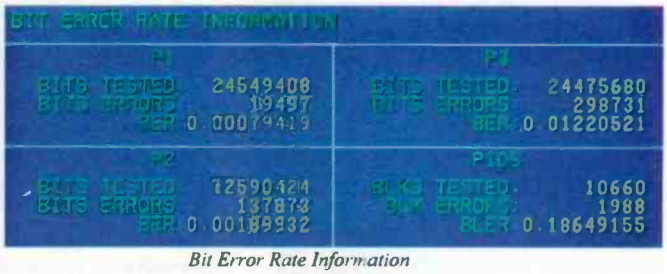

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Contributor Profile

Meet the professionals who write for *Radio* magazine. This month: Field Report, page 74.

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Eisenhamer has been a broadcast engineer for 18 years, the last eight with Lincoln Financial Media, formerly Jefferson Pilot Communications. He has worked for Noble Broadcast, New Century, and Nationwide Communications. In addition to being a broadcast engineer, he is also an MCSE. Outside of radio he enjoys photography and mountain bike riding.

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by Kari Taylor, senior associate editor

Do you remember?

Gates-Harris Intertype manufactured and marketed the Vanguard I 1kW AM transmitter during the early 1960s. The transmitter combined solid-state circuitry with a single tube amplifier. Built-in remote metering was provided as well as accommodations for top or back air exhaust. All interior components were accessible from the bottom of this transmitter, which sported an usual shape for its day.

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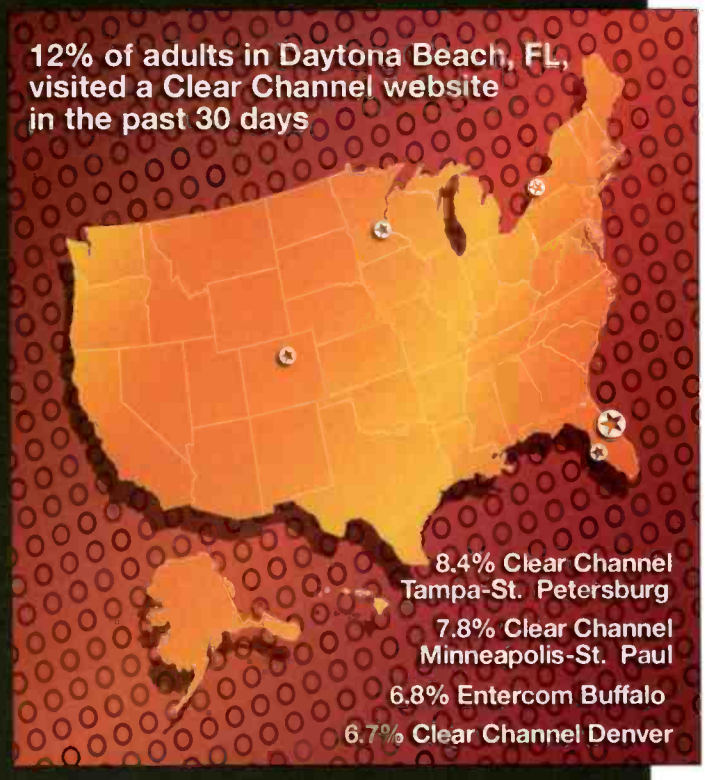

Source: The Media Audit, Top Markets for Radio Website Listening, January 2007.

That was then

This picture was published in the Cox Radio Annual Report from 1967. At the time, AM ruled the airwaves. FM radio was still considered new, even though many stations had been launched in the 1940s. Many FM stations were simulcasts of the AM or automated with classical or other music. The new WSB-FM studios were the equal to most AM studios in the country at that time.

Photo courtesy of Mitch Wein, Cox Radio Miami.

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