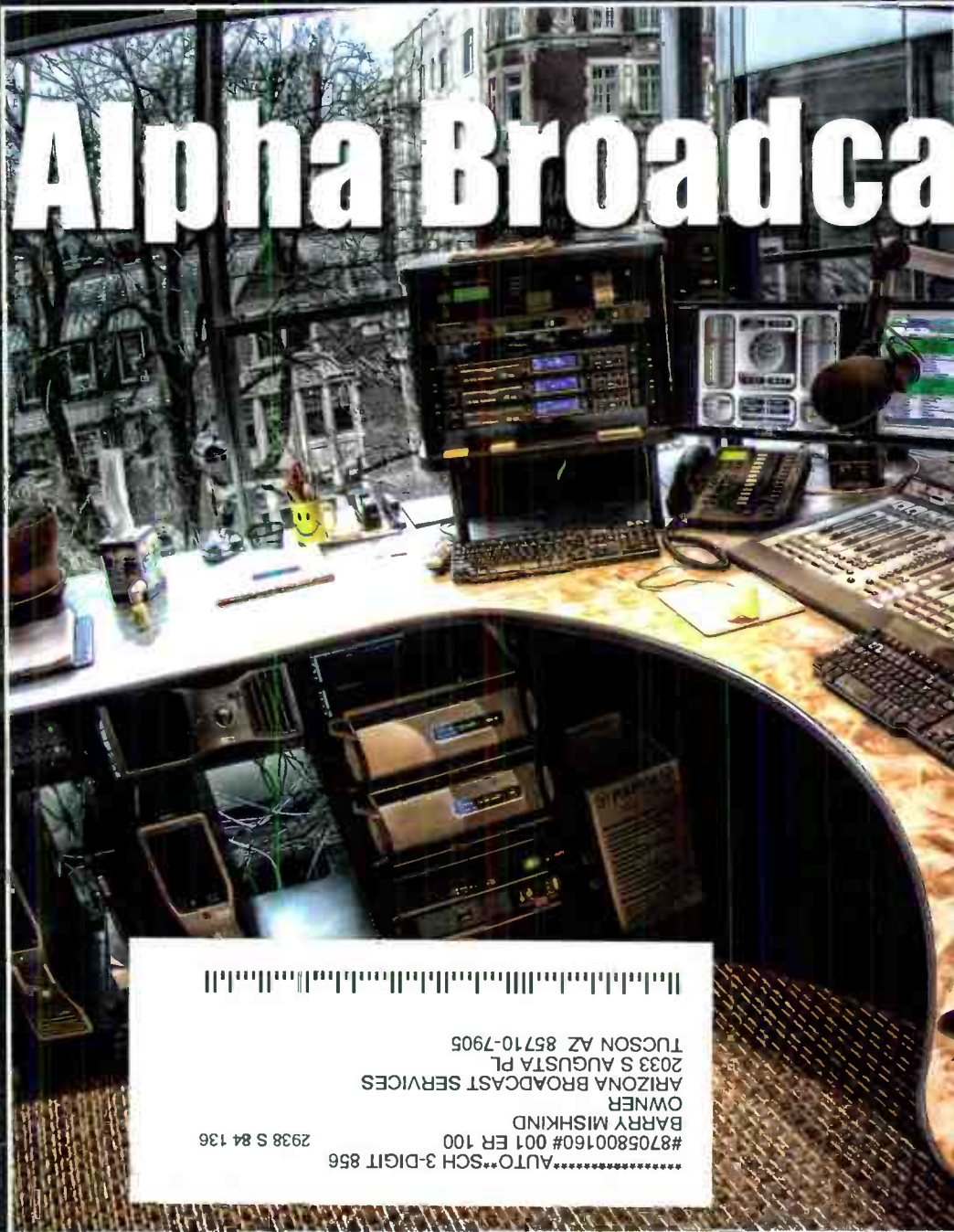


# Radio

THE RADIO TECHNOLOGY LEADER

March 2011  
RadioMagOnline.com



# Alpha Broadcasting

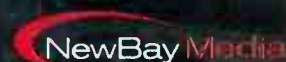
Facility consolidation features a live performance lounge

## NAB SHOW PREVIEW

Insight to new products and sessions

## TRENDS IN TECHNOLOGY

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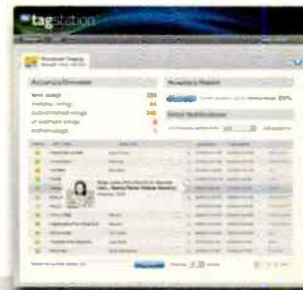
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### ON THE COVER

In addition to some great-looking studios, when Alpha Broadcasting embarked on a major rebuild, a performance space took center stage. Read the story on page 52.



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# Report-IT 'Codec Moments' Score a Hole in One

“ The advantages of Report-IT Enterprise are obvious. This development is huge for field reporters like me...

- Kevin Allen, Producer/Host, *Views from the Rough* ”

We've all heard of those Kodak moments and in my career as a professional photographer and now as producer and host of the weekly golf talk show "Views from the Rough", I've had many of these. I'd also like to share a more recent experience, what I call my "codec moments".

When interviewing hundreds of professional athletes in the past I had to make sure that I had my cassette recorder, mike, fresh cassettes, batteries and headphones with me at all times. More than once, something would be missing. I'd eventually get the interview, but all the equipment was a burden and foul-ups were embarrassing. I kept thinking there had to be a better way - something simple, something compact, yet reliable.

This is where my "codec moments" come in. Tieline has developed the Report-IT Enterprise iPhone application which turns the iPhone into an audio codec and professional portable recorder. This development is huge for field reporters like me - now all I have to carry is my iPhone.

The iPhone mic has a studio quality response and I press just one button on Report-IT to connect to my studio and feed broadcast quality audio. Report-IT also lets me record and edit interviews and then play back these selections as a live insert within my live reports. I can also feed raw audio back to my FTP site for editing when I'm back in the studio.

For anyone who has tried to interview a celebrity at a moment's notice, the advantages of this new technology are obvious. I can capture comments and intriguing conversations that would be missed while setting up a traditional recorder. Plus I'm not lugging ten pounds of equipment around 18 holes!

Back at the club house or the media room, I don't have to keep an eye on equipment, and my iPhone or my iPad is ready to record those personal nuggets that make Views from the Rough so unique. I invite you to listen and judge for yourself at [www.viewsfromtherough.com](http://www.viewsfromtherough.com).



Kevin Allen "Views from the Rough"  
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World Radio History



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## Currents Online

Selected headlines from the past month.

### Du Treil, Keller to Receive NAB Engineering Achievement Awards at 2011 NAB Show

The NAB established the Engineering Achievement Award in 1959 to recognize technical accomplishments and contributions to the broadcast industry.

### Broadband for First Responders Act of 2011 Threatens 450MHz RPU Band

To offset the cost of construction of this network, the bill looks to auction the 450MHz spectrum, but does not propose replacement spectrum for BAS use.

### NAB/RAB Announce Hotel for 2011 Radio Show

The show will be held at the Hyatt Regency in Chicago.

### FCC Names Six to Technical Advisory Council

The council members will share ideas and recommendations on how to best harness technological innovations in the current business landscape.

### NABEF to Honor Target with Corporate Leadership Award

The award will be presented at the 2011 Celebration of Service to America Awards on June 26, 2011.

### Eddie Fritts to Receive NAB Distinguished Service Award

Fritts served as the president of the NAB for 23 years.



du Treil

### FCC Adopts Order for First-ever Presidential EAS

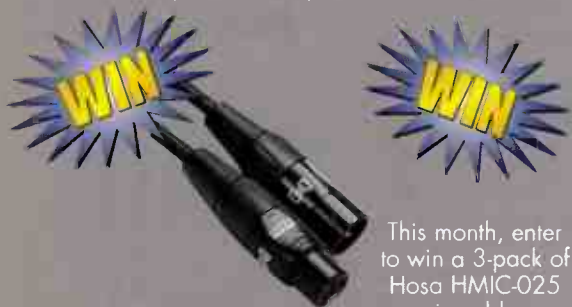
The date for the National EAS test has yet to be determined.

### FEMA: List of CAP-Compliant Equipment Expected in March

Several EAS experts say broadcasters will continue to be the backbone in a new warning system.

## Find the mic and win!

Tell us where you think the mic icon is placed on this issue's cover and you could win a prize courtesy of Hosa.



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## Site Features

### EAS Info

There are plenty of questions about EAS. We are trying to find the answers. Check out the EAS section online for information about equipment status and rulings.

### E-newsletters Keep You Informed

The Radio Currents comes to you each week, Digital Radio Update and the New Products Extra come to you twice a month, and the NAB Insider provides all the convention info you need leading to the NAB Show. Sign up today.

### Advertiser Links

Want to know more about an advertiser? We have Web links to the advertisers in the March issue.

### Industry Events

The Radio magazine Industry Events section lists upcoming conventions and conferences.



# SMART:



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## See you in Las Vegas?

**I**t's like a broken record: "I can't believe it's time again for the NAB Show. It seems like we just finished the last convention." And here we are, saying it again.

What's in store this year? Lots of new products, more sessions than ever, several high-profile speakers, and an expanded convention scope. The "B" in NAB Show doesn't cover the wide range of technology and industries, which extends to cinema, online and some consumer areas. It truly is an electronic media expo.

Once again, the radio and pro audio areas are in the front of the Central Hall. I like this location because it's closer to the South Hall session rooms, where the Broadcast Engineering Conference sessions are held. It also puts my home base in the center of the entire convention, and there are a number of exhibitors with relevance to radio who are outside the radio area. We have assembled a collection of new products that will be unveiled this year in our NAB Extra! From the mic to the antenna or streaming server, you'll find plenty of new things to see on the exhibit floor.

And to help you find the exhibitors, our annual pull-out Radio Hall map is included in this issue. This includes an exhibitor index so you can easily track your path. You can also download the Radio Hall map so you can take it with you.

The sessions are always abundant with information, and this year is no exception. Starting with the SBE Ennes Session on Saturday, the rather dry topic of facility infrastructure is given a new look with topics ranging from tower management to IPv6. If you can make it part of your schedule to arrive for the Ennes session it's well worth it.

The remainder of the Broadcast Engineering Conference covers new and emerging technology, HD Radio, cloud computing, IT, regulatory issues, emergency operations, datacasting and going green. How's that for diversity? Overall it's a good mix of theoretical and practical information for engineers.

But there are some sessions outside the Broadcast Engineering track that may interest engineers. A

handful of sessions from the Broadcast Management track look interesting, particularly the Monday session about the FCC's Consolidated Licensing System and the Tuesday session called "The FCC and You". There's also a super session on Tuesday called "Media Devices in a Connected World".

We've created a condensed session timetable for you in our convention preview as well. And if you want to add the sessions to your Outlook or Google calendar (or other app that reads ICS files), we created links so you can stay on time throughout the show.

We've all heard that economic indicators are looking up. Reports on station ad revenues reflect this as well. I expect the attendance figures will increase once again this year, so make the most of your time at the convention by planning your course now.

### A fond farewell

In February, *Radio* magazine transitioned from being a Penton Media publication to a NewBay Media publication. As our editorial mission continues, the same regular contributors are still a significant part of what we do – with one change. *Radio* magazine's FCC Update column has been authored by Harry Martin since *Radio* magazine was launched in 1994. Harry's roots started with *Broadcast Engineering* magazine, where Harry also writes the FCC Update column today.

With *Broadcast Engineering* staying at Penton, a change followed, and Harry will stay with *BE*. Harry has been an outstanding contributor to *Radio* magazine, and I'll miss working with him. However, the FCC Update column will continue going strong as Lee Petro takes over that space. Lee's inaugural column is in this issue. Welcome aboard, Lee!

What's your opinion? Send it to  
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# Method of moment proof

By Jeremy Ruck, PE

I must admit that several years ago when the method-of-moments proof concept began to be seriously considered by the FCC, both Don Markley and I had some reservations about its use. The objections were not based on any problem with the theory, but rather concerns about how to independently verify the performance of an array licensed by this method. Were adjacent stations really being protected or would such proofs ultimately become a dry-lab exercise?

The requirement of the reference field strength measurements described in the rules, combined with our firm actually performing some of the proofs, have allayed my original fears. This valuable tool has become yet another available to the broadcast engineer. Like any tool, though, there are certain applications where another tool is more appropriate. Think of the traditional proof as a set of slip-joint pliers and the moment method proof as a ratcheting combination wrench. The pliers will usually loosen any nut, however, the wrench is a more specific and elegant solution. With increased specificity, however, comes the potential for exclusion in certain circumstances.

At the heart of the moment method proof is a computer model using an appropriate software package. There are several different ports of the code. The ports of the code vary in their user interface and usable platform. In some cases, there are PC

Therefore, the use of this process is more or less limited to the run of the mill "traditional" designs.

It would be logical to assume the towers in any given array are actually at the locations relative to the reference point as specified in the authorization. Often, however, the distances and orientations may not completely agree. Variances typically result from survey error, clerical error, or insufficient accuracy in techniques, and in the cases other than clerical are typically limited to older construction. Since the MoM proof is based on modeling rather than a plethora of ostensibly verifiable and repeatable field strength measurements, it is necessary to use the actual spacing and azimuths between the constituent elements in the model. As a result, a stamped survey by a registered land surveyor in your jurisdiction will be required. This survey must be an as-built version, and not the one utilized to lay out the locations during construction.

Once the as-built locations are known, a suitable model of the array can be constructed. In constructing the model, a simpler set of parameters that meets the minimum FCC requirements and does not violate internal program constraints is ideal. Early on in working with the software, one mistake that is commonly made is to make the model much more complex than it should or needs to be. An overly complex model, when it comes time to vary the parameters to match the measured impedance values, will become unwieldy, require excessive time for convergence, and ultimately not yield more accurate results. A kiss is always a good thing.

Invariably, the resulting impedance values determined from the software will not fully agree with the matrix determined from accurate measurements. At this point, tweaks in the physical model can be made to make the model converge to the empirically determined impedances. Tweaks, however, may not be employed to force the array element outside of the constraints of 47 CFR 73.151(c). In no cases may the location and azimuths be modified from the surveyed values, so changes are limited to the variables that make up the tower including lumped inductance and base region shunt capacitance, and size changes near the base. The rules require that the impedance measurements be made with all other towers either open-circuited or shorted. Taking both sets, however, is a good technique check as well as an alternate variable in case model convergence becomes overly problematic.

Once this state of convergence is reached, the



**Except for some verification measurements, a MoM proof eliminates the ongoing monitor point checks.**

executables, while in others the FORTRAN source code must be adapted and compiled. Regardless of the particular flavor, the goal of the computer modeling is to mathematically define the array adjustment error, and eliminate the human opinion or subjectivity component.

The moment method proof, however, is not applicable in all cases or array designs. For instance, arrays utilizing top-loading, sectionalized elements, or folded unipoles (i.e. skirted towers) must go the traditional route. In addition, shunt-fed elements also preclude the use of the method of moments.



set of desired antenna monitor parameters results. The parameters may be measured with either sample loops or current transformers. Use of loops, however, is limited to arrays where the towers are identical in cross-sectional structure. The identity of cross-sectional structure includes both leg and cross member characteristics, and not just face size. Loops may be used with unequal height towers; however, the loops will need to be mounted at identical locations on each tower. In other cases, current transformers will need to be utilized.

The required location of current transformers continues to be at the output of ATU, while the loop location becomes defined. Under the traditional method loops, because they are voltage-sensing devices, tended to be placed around voltage maxima on a tower. Under MoM, they must be located at the minimum current point if the tower were detuned. For unequal height towers, the location needs to be at the same location with respect to cross members at the appropriate elevation above the base insulator.

An acceptable sample system under MoM requires two sets of verification measurements. One is used to demonstrate rule compliance, while the other aids in baseline construction for subsequent system verification. As stated in the Rules, sample lines must be equal in length to within one electrical degree at carrier and impedance within  $2\Omega$ . By the traditional method, we could simply state that the lines were equal length, and while they were probably close, there was not the degree of precision that MoM requires. Here, the arcane procedure listed in the rules must be explicitly followed and indeed demonstrated to the Commission when the supporting documentation is filed.

Each of the sample lines is measured with it open circuited at the transformer or loop end of the run. In this configuration, the series resonant frequency closest to the carrier frequency is sought. At the frequency where series resonance is achieved, the measured resistance will be close to zero, as will the reactance. This location will wind up being an odd multiple of 90 degrees at the determined frequency. The impedance is then measured based on frequencies that correspond to  $\pm 45$  degrees in length.

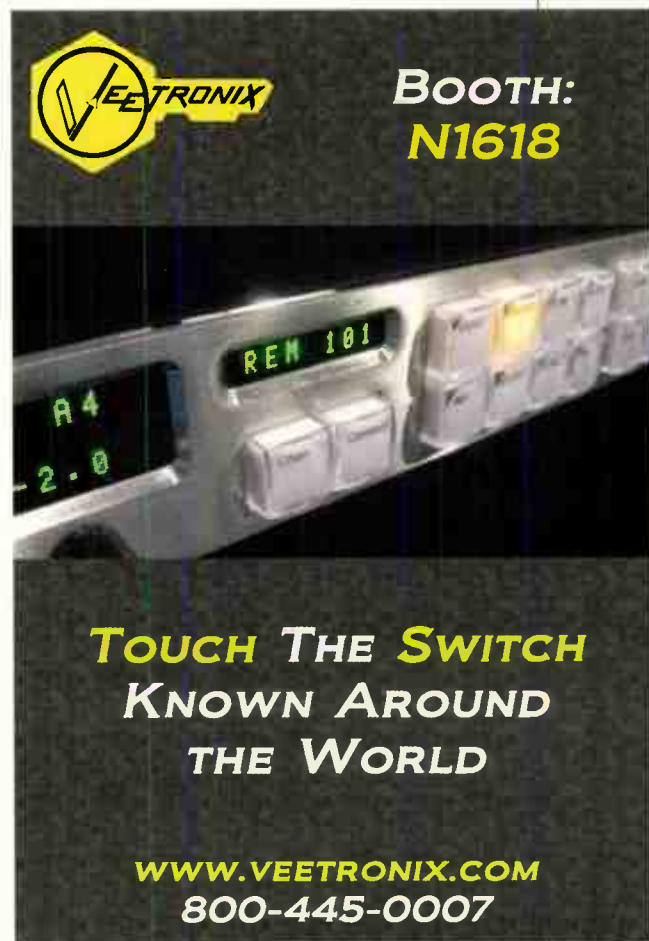
Once adjustment is made according to the derived parameters, and the sample system is found to be within acceptable limits, a series of reference field measurements are made. These measurements function like monitor points, and are invaluable for subsequent diagnoses. At least three must be performed on each azimuth corresponding to pattern maxima and minima. Although a photograph requirement is not expressly listed in the rules, GPS coordinates and a physical description must be included. The exclusion of a photograph at each point considering the cost and availability of digital cameras really seems somewhat silly, so spending the extra time to include an image may help resolve

subsequent disputes. These field measurements, which also include recertification of the sample system, must be performed and placed in the public file at least every two years.

The moment method proof has the capacity to reduce the proof expense required with arrays. This is especially true in cases where the patterns are difficult, or in geographic areas where the acquisition of field measurements is extremely difficult, or impossible. For existing constructions, relicensing may require significant sample system modifications, so there may not be any huge economic benefit. Finally, for the simplest of all arrays, the 90-degree-in-height, 90-degree-spaced two-tower, the cost associated with both methods is probably a wash.

The bottom line is that the MoM proof, when properly applied, is a superb tool. The level of accuracy is quite good, and verification field measurements eliminate the dry-lab concerns. Perhaps one of the best features is the removal of subjective analysis. After all, the traditional analysis is based on the veracity of the non-directional inverse field, which can be highly subject to interpretation. That is, however, a topic for another day.

*Ruck is a senior engineer with D.L. Markley and Associates, Peoria, IL.*



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## Early preparation for renewal cycle required

By Lee G. Petro

**T**he license renewal process will begin for radio broadcasters in Delaware, Maryland, Virginia and West Virginia on April 1, 2011. By the end of the year, radio station licensees in nine additional states will have submitted their renewal applications (FCC Form 303-S).

Over the years, the FCC has reduced the amount of information that licensees are required to submit with their applications. As a trade-off, though, the FCC requires licensees to make series of certifications by which licensees confirm that they have complied with the FCC's rules. The 2011 version of the renewal application has been updated to reflect changes in the rules since the last renewal cycle, so it is impera-

tive that all broadcasters make sure they understand the certifications, and what information should be reviewed, prior to either certifying compliance with the FCC's rules, or preparing complete explanations of the deficiencies.

If your station is filing a renewal application in 2011, you should start reviewing the renewal application as soon as possible, with special focus on the certification to be made therein. As with the previous renewal application form, a licensee must

the changes in the FCC's rules since the last renewal cycle. In particular, the FCC will now require three certifications relating to the operation of the station, and require explanations, including applicable dates, if the station has been non-operational for more than 30 days, and/or for more than 12 months, at any time during the prior license term. As such, it is important that the licensee review its records and logs and determine if the station has been silent, and gather facts to describe the circumstances surrounding such non-operation if necessary.

Moreover, the FCC will now require the licensee to certify that the station's "advertising sales agreements do not discriminate on the basis of race or ethnicity and that such agreements held by the licensee contain nondiscrimination clauses." Even though the new rule was adopted as part of the FCC's 2007 Diversity proceeding, which did not become effective until 2008, the licensee must certify compliance for the entire license term.

Finally, the renewal application includes certifications with respect to two broadcast ownership matters. First, the FCC will require a certification that it complies with the radio/newspaper cross-ownership rule, which presumes a public interest benefit if the radio/newspaper combination occurs in a community located in a Top 20 DMA, and presumes the negative public interest impact if the combination exists outside of a Top 20 DMA. The FCC also incorporated the "eligible entity" policies adopted in the 2007 Diversity proceeding which sought to encourage new entrants into the broadcast industry by permitting investment in qualifying entities above the 33 percent equity-debt plus standard otherwise applicable under the FCC's ownership rules.

As the saying goes, the devil is in the details, and the otherwise short certifications contained in the renewal application require a thorough review of supporting information to confirm that your station can make an affirmative certification. The FCC was very active in the last renewal cycle imposing forfeitures for false and/or incomplete certifications, and it is in your best interest to begin this process as early as possible.

*Petro is a member of Fletcher, Heald & Hildreth, PLC, Arlington, VA. E-mail: petro@fhlaw.com.*

### Dateline

Radio stations located in the District of Columbia, Maryland, Virginia, and West Virginia must begin their pre-filing announcements with regard to their applications for renewal of license on April 1, 2011.

April 1 is the deadline for radio stations located in Delaware, Indiana, Kentucky, Pennsylvania, Tennessee and Texas to place EEO Reports in their public inspection files, and on their websites, if one exists.

Non-commercial radio stations in Texas must file their biennial ownership reports (FCC Form 323-E) by April 1.

A listing of each station's most significant treatment of community issues must be placed in the station's local public inspection file by April 10.

certify that it has placed the necessary information in its public file at the appropriate time during the license term. Other certifications relate to past civil or criminal adverse findings, FCC violations determined by the FCC relating to the licensee (e.g., notices of apparent liability, forfeiture orders), and compliance with the FCC's alien ownership rules.

In addition, there are several new certifications that have been added to the renewal application reflecting



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## Get there fast

Everyone knows the NAB Show is the largest broadcasting event of the year. It's not just a broadcast event anymore either, as it includes just about anything related to electronic media. Even saying that digital technology will be a hot topic doesn't cover it anymore when you consider that covers HD Radio, streaming, handheld devices and apps, crowdsourcing and plenty of ways to transmit data. And there will be plenty of examples of these technologies and more throughout the show.

But the convention also often established and somewhat fundamental technology. Tied in with the sessions and it's easy to justify attending the show even for a few days.

But the time to plan a route at the convention is not when you land at the airport. The savvy convention-goer

knows to plan ahead. That's where the Radio magazine NAB Extra session outline and Radio Hall map come in handy. Like your trusty GPS, these features can help you plan the best use of your time and find your way around the convention.

Even if you don't make it to the NAB Show, our preview still helps you get a taste of what's going to be there. And next month we'll follow up with the last-minute product announcements, so look for that, too.

See you in Las Vegas

— Chris Scherer, editor





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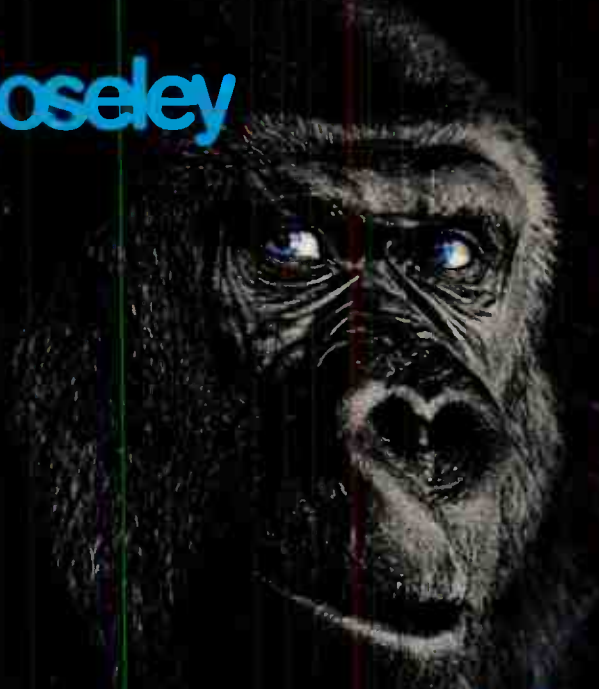
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**Booth C453**

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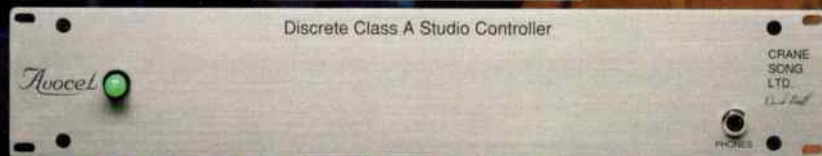


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**Call Classic:** A four-line phone-in system with options of a POTS digital hybrid or an ISDN G711/G722 codec for each of the four caller lines, Call Classic allows a mixture of POTS and ISDN lines on the same system. The POTS hybrid ensures up to -76dB separation on each caller line and consistent caller output levels across all four lines. The Call Classic is unique in also featuring an ISDN codec with auto switching G722/G711 algorithms. This enables traditional ISDN links to outside broadcasts using the G722 standard, as well as the option to use G711 to connect with a normal POTS line. The main inputs and outputs of the system are available in the 1RU 19" subrack - the Call Classic Base Station. System controller and communication are via a CAT-5 connection to the desktop Call Classic Controller. The Controller includes a phone handset, dialing keypad, and the routing buttons for all four caller lines. Two Controllers can be used on a single Base Station allowing a screener in a separate location, while the presenter puts them on air directly or via the Next function. The system can also be used in a self op mode with a single Controller.

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## Stereo wireless microphone interfaces

### **JK Audio**

#### **Booth C153**

**BlueDriver S Series:** Using aptX low-latency coding in stereo over Bluetooth wireless technology, these stereo wireless microphone interfaces link between a stereo microphone and a camera equipped with a stereo mic input. CSR aptX's full audio-frequency bandwidth matches hi-fi performance. Its low audio coding delay minimizes latency effects and "lip-sync" issues. The new S series models are dedicated transmitters or receivers. Mix any female transmitter with any male receiver. These models can also pair to other JK Audio Bluetooth equipped products using aptX low latency, and remain backward compatible with other SBC equipped A2DP products.

800-552-8346; [www.jkaudio.com](http://www.jkaudio.com); [info@jkaudio.com](mailto:info@jkaudio.com)



## Prewired wall component

### **WhisperRoom**

#### **Booth SL5005**

**XLR Jack Panel:** Catered to audio engineering applications, the XLR panel will allow audio professionals to plug in DAVVs, instruments, mics and other equipment. The XLR option would be a 40" wall component with a prewired insert. There is a 26" x 36" wall window above the panel for optimum visibility, as well as a cable passage for situations where additional cables need to be utilized. The XLR panel option will be available for all models except the MDL 4230 (3.5' x 2.5').

800-200-8168; [www.whisperroom.com](http://www.whisperroom.com); [whisper@lcs.net](mailto:whisper@lcs.net)

## Studio microphone

### **Sennheiser Electronic**

#### **Booth C2055**

**MK 4:** This cardioid microphone, manufactured in Germany, is Sennheiser's first large-diaphragm side-address microphone. With its nickel-colored finish, its sound structures are well resolved, and sound coming from the sides is picked up without coloration. The microphone has a harmonious presence; it has vivid mids and is also very detailed in the bass range. At the same time, typical cardioid cancellation is relatively frequency-independent. Its 1" diaphragm is precisely spattered with 24-carat gold. The sturdy metal housing and the elastically mounted capsule make the microphone tough.

860-434-9190

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

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**Rackmount docks**  
**Middle Atlantic Products**  
**Booth C10845**

**RSH Series:** With new options for rackmounting a wide variety of iPod and other portable media player docks, the RSH Series is custom cut to precisely fit the face of each piece of equipment, and now includes options for a number of popular docks, allowing a more uniform look for professionally installed rack systems. These new designs enable easy access to buttons, IR windows, LEDs and other indicators. The large opening allows docks and players to be easily inserted and removed, while a 4RU size accommodates most brands of iPod docks and other media players.



973-839-1011; [www.middleatlantic.com](http://www.middleatlantic.com)  
[sales@middleatlantic.com](mailto:sales@middleatlantic.com)

**Portable recorder**  
**Yamaha**  
**Booth C1325**

**Pocketrak C24:** Delivering 24-bit/96kHz sound quality in the smallest size (2oz.), the C24 features 2GB internal memory, a non-directional mic, is expandable with high-capacity microSD cards, on-board speaker, a built-in tuner and metronome, peak limiter, 5-band equalizer, high-pass filter and an attachment clip. Slide out the USB connector and the C24 connects directly to a USB port. An hour of recorded sound can be transferred in 10 seconds. C24 comes bundled with Cubase A15 software.



714-522-9000  
[www.yamaha.com/proaudio](http://www.yamaha.com/proaudio)  
[infostation@yamaha.com](mailto:infostation@yamaha.com)

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**Neutrik**  
**Booth C8137**



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NAB Booth  
**C153**

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World Radio History

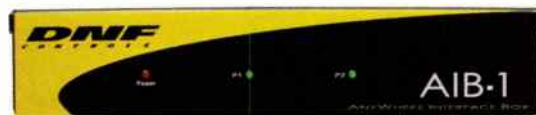
**Codec plug-in**  
**Fraunhofer Institut**  
**Booth SU5520**



**Sonnox Pro-Codec:** The new Sonnox Fraunhofer Pro-Codec plug-in auditions up to five codecs in real time within a DAW environment, produces an optimized mix and batch encodes to multiple formats simultaneously. All major codecs, including MP3, MP3 Surround, AAC-LC and HE-AAC are supported, as are lossless codecs such as MP3 HD and HD-AAC.

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**Booth N2115**



**AnyWhere Interface Box:** A compact single-box "missing link" solution, the AnyWhere Interface Box (AIB) provides eight opto-isolated GPI inputs, eight relay contact closure GPO outputs, one RS422/RS232 serial port, and one 10 BaseT Ethernet port. The AIB supports GPI-to-GPO(s), -serial, -Ethernet and -SNMP control; serial, Ethernet and SNMP-to-GPO monitoring; and serial-to-Ethernet and -SNMP conversions; all of which are user-configurable.

818-252-0198; [www.dnfcontrols.com](http://www.dnfcontrols.com)

**Audio switcher**  
**Digital Alert Systems**  
**Booth C2952**



**MultiPlayer:** MultiPlayer eliminates the restrictions of sharing a single Emergency Alert Systems (EAS) encoder/decoder system with relays and switches by providing multiple and completely independent EAS switching, playout and control to simultaneously cover the EAS requirements of multiple program streams. MultiPlayer is configurable for analog or AES switching of up to four program streams and networks to any DASDEC system for management and logging. In addition, the integrated switching and multiple GPI/Os for each channel makes facility integration easy.

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970-461-0730; [www.arrakis-systems.com](http://www.arrakis-systems.com)  
sales@arrakis-systems.com

## USB extender Gefen Booth SL1405

**ToolBox USB 2.0 4-Port Extender:** This four-port USB 2.0 hub powers multiple computer devices at long distances. Up to 330' can be traversed by portable sender and receiver units that fit into any integrated system. Full bandwidth capability offers an instant delivery of multiple USB signals over a single CAT-5 cable. This product supports USB 2.0 with data rates up to 480Mb/s in addition to backward-compatibility with USB 1.1.

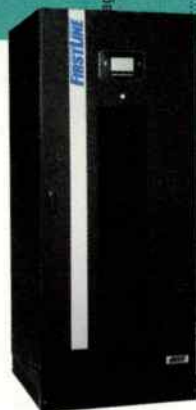
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gsinfo@gefen.com



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**FirstLine P:** A parallelable three-phase uninterruptible power supply (UPS) for 80-125kVA applications, FirstLine P features efficiencies of up to 98 percent. True online, double-conversion technology is achieved through IGBT and digital signal processor (DSP) control, enabling delivery of a high-input power factor of 0.99, and a low-input current distortion of less than or equal to 3 percent. Up to eight FirstLine P units (N+1) can be run in parallel, providing redundancy and requiring no additional hardware. All units are hot swappable, for maximum flexibility, availability and expandability. It requires only front, top or bottom access, so it can be placed against a wall, minimizing its footprint.

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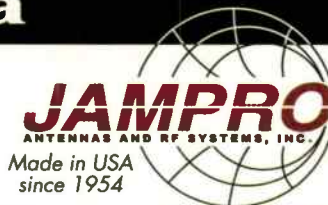
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## January issue

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# NABigation Made Easy

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**Booth C244**



**Program Delay Manager Version 2.0:** Version 2.0 of Program Delay Manager (PDM) enables PAD or "now playing" data streams to be delayed in precise synchronization with the audio delay as it grows, shrinks, or whenever the dump button is pressed. In addition, full, bi-directional serial control over PDM can now be accomplished from on-air systems or other devices via either RS-232 or IP. PDM features patent-pending PD-Alert e-mail notification with time-stamped audio clips of every dump event and artifact-free audio performance.

888-257-2578; [www.25-seven.com](http://www.25-seven.com); [info@25-seven.com](mailto:info@25-seven.com)

## STL application

**Barix**  
**Booth C8316**

**Reflector Service Updates:** Reflector Service eliminates firewall poking and static IP addresses that are difficult to configure. It even eliminates basic router forwarding configuration, as devices are automatically partnered following connection to the Reflector Service via the Web. New features for 2011 include tunneling the encoder inputs through to the decoder relay outputs, the ability to flag stream loss on a relay on both encoder and decoder devices, the introduction of automatic failover to playing local stored content on incoming stream failure at the decoder and the automatic generation of email alerts when a customer link has a problem. The user interface has also been updated to provide all significant monitoring information at a glance.

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# NABigation Made Easy

## On-air/production console

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**Booth C2628**

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In addition to mono, stereo and 5.1 sources are possible

as well, each of which can be assigned to a single fader. In addition, different modules with longer channel strips, so-called "Extensions" can be chosen. They feature high-quality OLED displays, rotary controls and buttons. The heart of the Sapphire is based on the Dallis system. Various other tools, such as an integrated router, signal processing with dynamics units, EQ, silence detects or the integrated talkback function, contribute to this end.

+49 7222 1002 0; [www.lawo.de](http://www.lawo.de)

[info@lawo.de](mailto:info@lawo.de)



## Hardware control surface

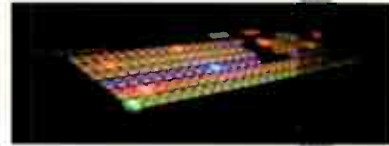
**NewTek**

**Booth SL4514**

**TriCaster TCXD850 CS:**

This hardware control surface for the TriCaster TCXD850 high definition (HD) portable live production system provides a physical connection to the 24-channel system's functions and effects. It provides illuminated push buttons, twist knobs, a premium T-bar and three-axis joystick to control all of the functions and effects available. Other features include virtual input rows, new utility row, utility bus delegate, live virtual set, media player, positioned and transition controls, and one-button streaming and recording.

800-847-6111; [www.newtek.com](http://www.newtek.com); [cs@newtek.com](mailto:cs@newtek.com)



## FM band pass filters

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**Booth C2032**

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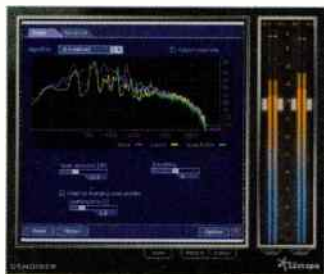
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World Radio History

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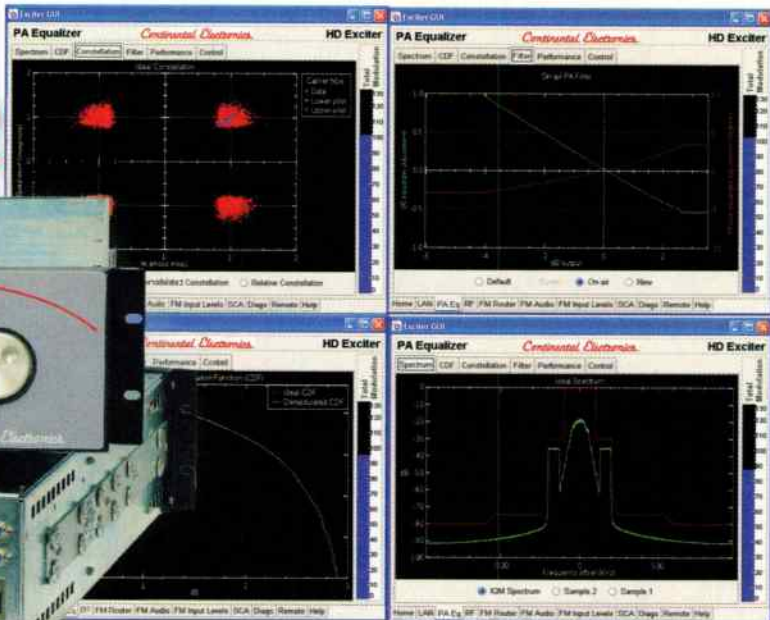
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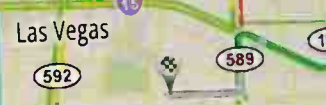
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Saturday April 9			Room
SBE Ennes Workshop - Infrastructure: Keeping it Going in Challenging Times	8 a.m. - 9 a.m.	Infrastructure 101, Part I	5219
	9 a.m. - 9:15 a.m.	Opening Remarks	
	9:15 a.m. - 10 a.m.	Infrastructure 101, Part II	
	10 a.m. - 10:45 a.m.	Broadcast Engineering in Modern Economic Times	
	10:45 a.m. - 11:30 a.m.	Keeping it Going in the Real World	
	11:30 a.m. - 12:15 p.m.	Monitoring and Control	
	1:30 p.m. - 2:15 p.m.	IT Infrastructure and the Accidental Administrator	
	2:15 p.m. - 3 p.m.	Improved Tower Management	
	3 p.m. - 3:45 p.m.	KREX - Real-world Disaster Recovery	
	3:45 p.m. - 4:30 p.m.	Maintaining Power for Broadcast Facilities	
4:30 p.m. - 5:15 p.m.	Transitioning to IPv6		
Sunday April 10			Room
	9 a.m. - 9:30 a.m.	Broadcast Engineering Conference Opening Keynote	5219
The Future of Radio Broadcasting	9:30 a.m. - 10 a.m.	Next Generation of Radio Content Collection and Delivery Tools	5228
	10 a.m. - 10:30 a.m.	Media on the Move: From Applets to Craplets	
	10:30 a.m. - 11 a.m.	Migrating Radio Call-in Talk shows to Wideband Audio	
	11 a.m. - 11:30 a.m.	Adding Visual Communications to Radio Broadcasts	
	11:30 a.m. - Noon	The Impact of Consumer Devices on Radio Content Development and Engineering	
Improving HD Radio	1 p.m. - 1:30 p.m.	PAPR and Asymmetrical Sidebands Field Results: HD Radio Coverage Technologies	5228
	1:30 p.m. - 2 p.m.	A Standardized Method for Radio Program Service Data Distribution	
	2 p.m. - 2:30 p.m.	New Developments in Master FM Antenna Systems	
	2:30 p.m. - 3 p.m.	Decision Points and Implementation Considerations for Elevated HD Radio Power	
	3 p.m. - 3:30 p.m.	Using the IBOC Quality Metric to Optimize the Transmission System for HD Radio Reception	
	3:30 p.m. - 4 p.m.	New Vector Power Enhancement (VPe) Scheme	
	4 p.m. - 4:30 p.m.	Transmitter Cooling Technologies and Tradeoffs	
Monday April 11			Room
	9 a.m. - 10:15 a.m.	All-Industry Opening Keynote	
Cloud-Based Technologies for Broadcast	10:30 a.m. - 11 a.m.	Planning for the Cloud - Essential Concepts and Applications for the Media Facility	5228
	11 a.m. - 11:30 a.m.	Does Cloud Computing Matter? Or, is there a Cloud in Your Future?	
	11:30 a.m. - Noon	Cloud-Based Graphics Creation Offers Broadcasters Lofty Rewards	
Mission Critical IT for Broadcast	1 p.m. - 1:30 p.m.	XML, WSDL, SOAP, SOA and REST	5226
	1:30 p.m. - 2 p.m.	Wireless HD Secure Streaming Media Application and Case Study	
	2 p.m. - 2:30 p.m.	10 Gigabit Networking for Audio and Video	
	2:30 p.m. - 3 p.m.	Seamless Audio Over Imperfect IP	
	3 p.m. - 3:30 p.m.	Using SNMP in Broadcast Facility Control	
	3:30 p.m. - 4 p.m.	Building Redundancy and Resilience into Broadcast Networks	
	4 p.m. - 4:30 p.m.	Integrating Audio Over IP (AoIP) with Program Automation	
	4:30 p.m. - 5 p.m.	Real time Professional Broadcast Signals Over IP Networks	
	10:30 a.m. - 11:45 a.m.	Making Localism Sound Great	N235
	1 p.m. - 2:15 p.m.	Radio-ready Cell Phones: Benefiting Consumers and Broadcasters	N235
	4 p.m. - 5:15 p.m.	The FCC's Consolidated Licensing System	N239
Tuesday April 12			Room
Radio Engineering Forum I	9 a.m. - 9:30 a.m.	AM Directional Antenna Pattern Performance Improvement Using Power Dissipation within the Phasing and Coupling System	5228
	9:30 a.m. - 10 a.m.	Antenna Base: Region Geometry and Voltage Sampling Techniques for Moment Method AM Directional Antenna Proofs	
	10 a.m. - 10:30 a.m.	MDM Methodology	
	10:30 a.m. - 11 a.m.	Test and Evaluation of an AM Directional Antenna Tower Base Voltage Sampling System and MOM Proof Methodology for the WAOK Array	
	11 a.m. - 11:30 a.m.	KRKO-AM: 50kW Upgrade, Antenna Destruction, Reconstruction, and 50kW Diplex	
	11:30 a.m. - Noon	Building an AM Array on a Landfill	
	12:30 p.m. - 2 p.m.	Radio Luncheon	
Radio Engineering Forum II	1 p.m. - 1:30 p.m.	Monitoring and Control Systems for Broadcast Transmitting Sites	5228
	1:30 p.m. - 2 p.m.	Quality Radio Engineering on a Tight Budget	
	2 p.m. - 2:30 p.m.	Field Trials of Digital Radio Technologies	
	2:30 p.m. - 3 p.m.	Performance Analysis and Field Measurements with DRM+	
	3 p.m. - 3:30 p.m.	Automation Strategies for Sharing Resources and Talent	
	3:30 p.m. - 4 p.m.	Get the Most Out of Your Tower: Effectively Using Design Codes to Your Advantage	
	4 p.m. - 4:30 p.m.	Full Duplex for Your RPU Adds IFB	
	4:30 p.m. - 5 p.m.	Bend Radius	
	5 p.m. - 5:30 p.m.	A New Approach to Solid-State High-Power FM Amplifiers	
	2:30 p.m. - 3:45 p.m.	Washington Showcase	
4 p.m. - 5:15 p.m.	The FCC and You	N239	
Media Devices in a Connected World	2:30 p.m. - 3:15 p.m.	The Next Generation	
	3:15 p.m. - 4 p.m.	This Year's Gadget Buzz	
	5 p.m. - 6 p.m.	SBE Membership Meeting	5220

Continued on page 45



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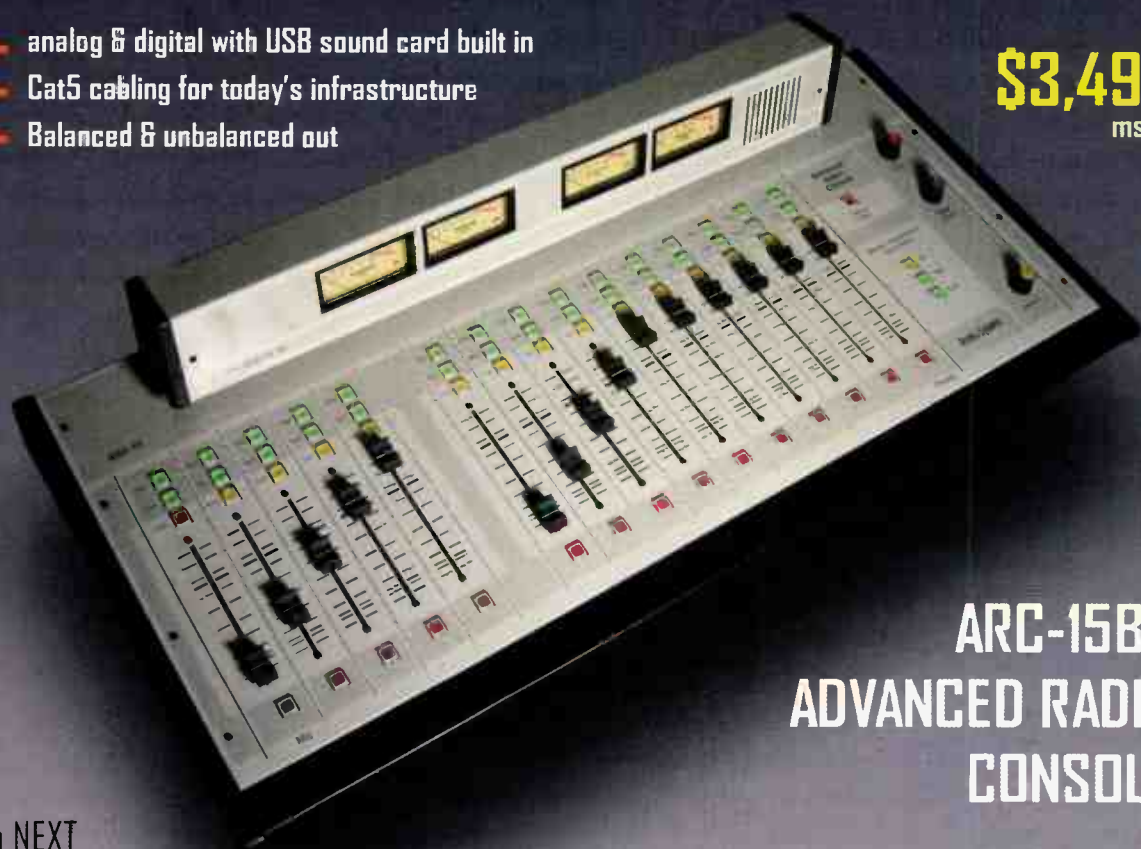
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Continued from page 40

Wednesday April 13			Room
Implementing Regulatory Issues for Engineers	9 a.m. - 10:30 a.m.	Joint EAS Panel with Legal	S226
	10:30 a.m. - 11 a.m.	When the Inspector Comes Knocking	
	11 a.m. - 11:30 a.m.	FCC Broadband Plan the Potential Impact on Television Broadcasting	
	11:30 a.m. - Noon	Transforming Closed Captioned TV into Closed Captioned Web Video	
	Noon - 1:45 p.m.	Technology Luncheon	Hilton
Emergency Operations - Planning & Implementation	2 p.m. - 2:30 p.m.	Case Histories in Lightning Protection and Grounding	S226
	2:30 p.m. - 3 p.m.	Cellular Wireless as a Video Streaming Transport	
	3 p.m. - 3:30 p.m.	Keeping the Lights On - Business Continuity Planning for the 21st Century	
	3:30 p.m. - 4 p.m.	Proactive Transmitter Service and Support Strategies	
	4 p.m. - 4:30 p.m.	Master FM Antenna at the Empire State Building	
	4:30 p.m. - 5 p.m.	Implementation of N+1 Technology for Improved Cost Efficiency While Maintaining Service Integrity	
Internet-Enabled Radio and Television	2 p.m. - 2:30 p.m.	Implementation Example for Use of Smooth Streaming and Adaptive Streaming Technology	S228
	2:30 p.m. - 3 p.m.	An Advanced Hybrid Broadcast and Broadband System for Enhancing Broadcasting Services	
	3 p.m. - 3:30 p.m.	Weather in a Multi-Channel, Multi-Screen World	
	3:30 p.m. - 4 p.m.	Tapping into the Blu-ray Potential	
RDS Implementation	4 p.m. - 4:30 p.m.	Maximizing the Potential of the RDS Bandwidth	S228
	4:30 p.m. - 5 p.m.	Understanding and Optimizing RDS for a New Generation of Receivers	
	5 p.m. - 5:30 p.m.	The Latest RDS/HD Datacasting Trends & Developments	
	6 p.m. - 8 p.m.	Amateur Radio Operators Reception	Hilton

Thursday April 13			Room
Green Technology	9 a.m. - 9:30 a.m.	Facility Planning R & R	S228
	9:30 a.m. - 10 a.m.	Do You Have it in Green? Points to Consider When Choosing Production Hardware	
	10 a.m. - 10:30 a.m.	Dynamic Carrier Control	
	10:30 a.m. - 11 a.m.	Going Green and Seeing Black: Mainstreaming Green Technology Into Broadcast Engineering and Programming	



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# The Details of SNMP

## Use your network to make your job easier

By Doug Irwin, CPBE AMD

One of the most useful aspects of having network access to a remote site is being able to look at the functionality of various remote devices simply by opening a Web browser and connecting to them over the Internet. Dial-up remote controls have, for many years, given us a way to monitor the basics – such as power output, plate voltage, tower phase and ratio, and the like. They could be programmed to call us in the event some pre-configured conditions were met. Some of them could even be programmed to carry out macros – a series of actions based on programming – such as changing transmitters.

Within the last 10 years, more and more devices had Ethernet access included in their designs, giving us the capability to look deeper and deeper inside of them by way of IP; audio processors, and newer transmitters are perfect examples. Along with network access naturally came SMTP (simple mail transfer protocol) and therefore the ability of the unit to send e-mails when some pre-configured conditions were met. This gave engineers the ability to know more about what was going on inside a remote unit – without having to be made aware by way of a phone call (at 3 a.m.). In New York we still use the call-out capability to be made aware of red-alert

conditions – such as dead-air or a transmitter being off; however, we use the e-mail capability of our remote controls to inform us of less urgent matters – like silence on a secondary or tertiary STL.

Let's go a step further now. Obviously when you use HTTP to look at your remote devices, you're only getting information that you want to see when you have the browser open. You proactively instigate a session. Of course, as I just mentioned, you can have remote devices e-mail you when they detect a problem. Naturally you should ask yourself the question: What will happen if my network connectivity is lost? How would I know that? What if you want devices – pre-programmed by engineering – to exchange information all the time, and to actually take action when conditions warrant? There is an easy way to do that, and it's known as SNMP (simple network management protocol). That's what this article is about.

The most basic set-up for SNMP is shown in Figure 1. At the remote end is a device that will communicate via IP, and that supports an SNMP *agent*. The agent is simply software that resides in that device. At the HQ end, there is another device that is a *manager*. The SNMP manager is software that is used to communicate



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with the remote agent. The manager sends messages to the agent via UDP/IP, using port 161. The agent will respond to the manager using UDP/IP port 62. The device that runs manager also runs an NMS (network management system) on which the various commands (seen below) are executed. Variable is the term for the condition or parameter measured or detected at the site of the agent.

There are five different types of SNMP (version 1) messages:

*Get-request*, which is a query sent by the manager to the agent about a variable.

*Get-next-request* (more on that when I talk about MIB browsers later)

*Set-request* which is used by the manager to alter a variable on the agent.

*Get-response* which is sent by the agent to the manager as a reply to a query about a variable.

*Trap*, which is sent from the agent to the manager, regarding a variable.

Devices that support SNMP usually allow you to configure traps that correspond to a state of some variable. The manufacturer gives you choices about what the traps are. Let's look at a real-world example of trap configuration, which is shown in Figure 2. This is a microwave receiver at our 4 Times Square transmitter site. (Keep in mind this particular set is blank – we don't use traps in our facility; we use get requests.) As you can see, there are four spaces on the left side for (up to) different manager addresses where the traps are sent. On the right side, you see four columns (that correspond to the four manager addresses). There is a box inside that you check when you want a trap associated with that condition, and the severity of the condition (see the lower columns on the right side.) There are 55 possible trap configurations per manager location. An NMS would be used to collect and view the traps.

Get-request is a message originated by the manager, and sent to the agent. Get-response is the agent sending a reply to that query; so it's pretty obvious that your manager can tell something is wrong (like the network is down) when it fails to hear from the agent on the other end. You gain one important piece of information from the lack of another. What happens if your dial-up remote control's phone line dies? Nothing. It can't call you to say so. Don't get me wrong – I still use them, and they have their place – but the ultimate capability of an older unit is a small fraction of what can be done with a remote control that has IP capability and SNMP support.

### Basic SNMP system

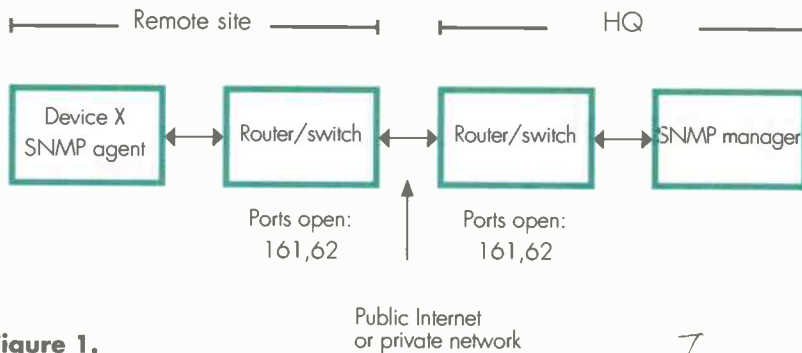


Figure 1.



Figure 2.

### Greater details

First let me introduce a couple of acronyms: MIB and OID. MIB stands for management information base. This is just a small file (which you can copy and paste to a text editor if you want to see what it really looks like) that (conceptually) is like a map that tells an SNMP manager *what* variables are available to be read and *where* they are. (If you want to get in to more details about how a MIB is constructed then check out the IETF RFC 1157). OID stands for object identifier. The format of the OID is a string of integers separated by decimals. The MIB is basically a structured collection of OIDs.

If you have a device that supports SNMP and will operate as an SNMP agent, the first thing you will need to do is to obtain the MIB from the device manufacturer. Usually that comes with the device when it's new out of the box (on a CD). Sometimes you can obtain it by browsing the device itself, or by obtaining it from the support Web page of the device. If the device supports SNMP then the MIB will be available somehow.



# The Details of SNMP

There are at least two devices out there that can function as SNMP managers: Audemat Relio and Burk ARC16 PlusConnect.

Take for example the case in which two Relios talk to one another; one being a manager, one being the agent. As the user you would do three things: Find the MIB for Relio (downloads from the unit), and make it available for

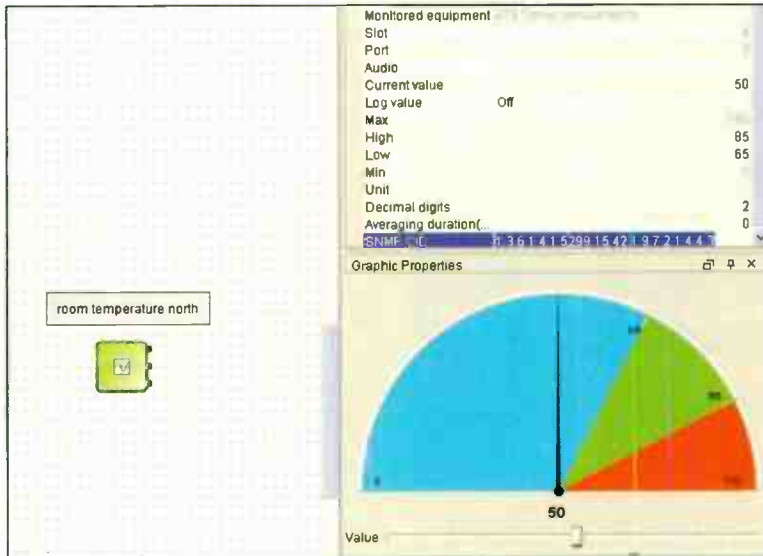


Figure 3.

the Scripteasy software (upload to a location accessible by Scripteasy). In the script on the manager, identify the IP address of the agent, and specify the MIB to be read when querying the agent.

Scripteasy is a scripting program done completely with symbols – all laid out visually. It's particularly easy to see the OIDs with Scripteasy, so it makes for a good example.

In Figure 3, you see part a small part of a script running on the agent. I've

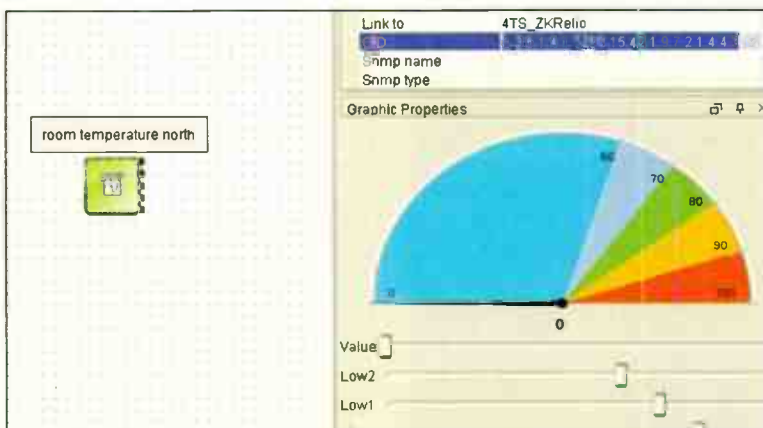


Figure 4.

highlighted a symbol that corresponds to a temperature probe in our transmitter space. On the right, you see I've highlighted the OID. Figure 4 shows the script on the manager. The symbol you see corresponds to SNMP get (in this case, getting an analog reading from the agent). You see that I've highlighted the OID again; obviously it's the OID from the agent (note the OID is the same).



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You can also see where I referred to the agent in the link to section (right above the OID).

What you will then have is a remote, real-time meter on the manager Relio that corresponds to the same meter over on the agent Relio. Making dynamic graphs with information gleaned by way of get request is a common function with SNMP. I should also note that this same agent will respond to multiple managers; I could paste this same analog temperature meter in multiple places, all at the same time.

Of course there are plenty of other devices that support SNMP and will act as agents.

Then need to configure it with the agent's address and its appropriate MIB. Let's review the necessary steps again:

Obtain an SNMP manager (can be software or a device like Relio)

See whether or not the device you want to monitor supports SNMP (if not, stop right here)

Obtain the MIB of the device you want to monitor.

Determine the write community and read community names. These are like rudimentary passwords. The manager will use these as it accesses the agent.

You'll need another piece of software now known as a MIB browser. The MIB browser reads the MIB, and after connecting to the device you want to monitor, reads the real-time data that is available, and tells you the OID that corresponds to pieces of information that you want. We use a freeware MIB browser from iReasoning that you can download at [ireasoning.com/mibbrowser.shtml](http://ireasoning.com/mibbrowser.shtml).

I've used our microwave receiver at Times Square as an example. See Figure 5(next page). I obtained this entire graphic by telling the MIB browser to perform what is known as a WALK command (which it does by sending get-next-request messages to the agent). What you see is a huge collection of information - way more than you'll ever need to use. (If you look at the left window, you'll see the MIB opened with the tree icon at the top, and leaf icons all the way at the end of the branches. Leaves correspond to the actual data being read.) Experience has shown that it is much easier to use a GUI or Web browser to determine just what you really want to monitor later via SNMP. (Ask yourself which variables are the most important while you study a device in







# Downtown Digs

A live performance hall highlights the new studios of Alpha Broadcasting

By Chriss Scherer, editor



KINK studio

Alpha Broadcasting was operating its six stations from three different studio locations in Portland, OR. Of the former studio sites, Alpha owned one and leased two. Like any split operation, there were always complications operating the multiple sites, and the stations could not take advantage of the built-in redundancies of being collocated. But all that changed at the beginning of 2010.

After looking for a suitable space for the Alpha stations and corporate offices, construction began on Jan. 11, 2010. All the stations moved in by September of that year. In addition to new air studios and offices, the facility includes an impressive performance space that has already hosted a plethora of famous artists.

## Studios to start

Alpha occupies space on three floors of its new building. The corporate offices (Alpha only owns



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stations in Portland) on the 7th floor use 4,000 square feet. The stations all operate from the 6th floor with 30,000 square feet of space. The performance space, called the Bing Lounge, is on the ground floor and occupies 3,000 square feet.

All this is on SW 6th Avenue, which is a typical downtown street – except that it is a main transit corridor for the Tri-Met light rail trains. While the central downtown location places the stations in the center of the metro, the traffic noise presented a challenge for Marty Hadfield, the director of engineering for Alpha Broadcasting.

Like any studios, having windows to the outside was important to provide a connection between the on-air operations and the city they serve. Likewise, weather can be unpredictable in the Northwest, and there's nothing worse than a jock saying it's sunny outside when it's really raining.

Double windows were installed in the perimeter



The exterior of Alpha Broadcasting at Pacwest Center

studios, but to ensure the train noise would not get into the studios, 3/4" glass was installed on the inside.

The glass panels, typically weighing 350lbs each were also installed in the Bing Lounge.

While dual glass panes provide very good noise rejection, they also present a new problem: Keeping the inside surface clean and clear. To keep the views unobstructed, an access panel was included in the window design. The hatch can be removed and resealed as needed for cleaning.

And while attention was given to outside windows, Hadfield was also considering windows between studios – or actually a lack of them.

The studios in the facility are arranged around the exterior of the floor in clusters rather than all being lined up in one section. The separation allows each station to retain its unique identity. Each station has at least a control room and voice tracking booth, and sometimes a talk studio. Rather than install windows between each one, Hadfield wanted to eliminate the potential noise leakage of a large window and use virtual windows: A large-screen monitor and a camera between studios.

Hadfield was very close to installing the system, but changed his mind while driving on the freeway. A small rock hit his windshield, and while there was no damage, the familiar smack reminded him that when a window fails, it fails open. When a camera or monitor fails, it fails closed. The air staff needs to be able to see room-to-room at all times, and he didn't want to add a layer of complexity and maintenance by needing to service a video monitor in the middle of the night.

In his research he also noticed that digital closed camera systems have a slight video latency. This delay would likely cause some confusion between the talent and the editors/directors.

## Power needs

Redundancy was a key design factor for the facility. The router nature of the Axia system, like all router-based systems, provides an

## The Bing Lounge

Many of the artists who have performed in the lounge like the space, mainly because it's acoustically very quiet. It's not a live room, but rather a very intimate space. The front row seats are 3' from the stage, which itself is only 8" high. (The low stage eliminated the need for special ramps and other safety requirements.) Some artists who have performed there: Shawn Mullins, Queensrÿche, Five for Fighting, Doobie Brothers, Crowded House and Clay Walker.



More photos and floorplans available at [RadioMagOnline.com](http://RadioMagOnline.com)

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immediate layer of redundancy. The STIs also have redundant links in place. But Hadfield wanted redundancy on power as well, and not just having a generator or standby. His power redundancy scheme starts with all racks and studios having a dual ac power feed. The main feed comes through 180kW diesel generator transfer switch. The secondary feed comes in directly from the power company. This provides emergency power when the power company has a problem, but it also provides an easy way to keep things powered if the generator's transfer switch needs to be taken offline.

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In all there are 21 total studio spaces: nine on-air control room/studio combinations, six voice track rooms, four production rooms and 11 news editor/reporter positions. The news positions are cubicles with extra attention to being able to record phone calls or record a feature.

There are three large video monitors in the air studios. All these monitors can take feeds from any of the computer systems, and two of the monitors also have cable TV tuners attached to them. One TV feed also feeds an Axia node so TV audio can be taken if needed.



Throughout the facility about half E-V RE27N/D mics and half SM7B mics are used, but there are a few special request mics in use, including a few SM5s. Most mic processing is handled through the Axia system.

While most stations use a T1 for an STL link, there are also 950MHz STLs installed. An equipment room on the 31st floor houses the transmitters. There is also a satellite dish installed on the roof, as well as several receive antennas. An Evertz fiber optic link runs from the 6th floor to the 31st floor, and an RF to fiber converter carries the LNB and the off-air signals to the 6th floor—without any loss. A redundant satellite antenna at one transmitter site also feeds its LNB to the studios via a similar fiber converter, and all satellite receivers reside in the rack room downtown.

### The Bing Lounge

The big feature of the facility is the performance lounge on the ground floor. The street in front has a slight grade, which naturally creates an elevated seating area in the back. There is also a control room looking into the lounge.

The large store-front space has instant street appeal for the 165-person theater. But during performances, heavy theater drapes can be pulled over the windows to avoid street distractions and improve the acoustic reflections inside. The same 3/4" studio glass was installed in the lounge to reduce street noise, and plenty of elastic caulk was used to seal everything. And while outside noise getting in was a prime concern, performance noise getting out was an even bigger one. Just above the Bing Lounge

**The Bing Lounge, located at street level, has played host to acts like Clay Walker and the Doobie Brothers.**

### The build team

Five Alpha Broadcasting Employees were involved in the facility build: Marty Hadfield, Chief Engineer Mike Everhart, Thor Waage, Phil Biehl and Will Price. In addition, four local contract engineers were involved: Matt Green, Todd Leninger, Wayne Anderson and Tim Woods Jr. The general contractor was Ashforth-Pacific.



## Equipment List

### Studios

Air Tools 6100  
 AKG C414 B-XLII  
 Allen & Heath WZ3-20S  
 APC Rack ATS, UPS  
 Aphex 230  
 Audion Labs Voxpro  
 Axia Element, IP intercom,  
 Powerstation  
 Broadcast Electronics  
 Audiovault  
 Broadcast Tools CC-II  
 Electro Voice RE-20,  
 RE-27N/D  
 Evertz fiber optic transceiver  
 Fostex 6301BEAV, PM-1 MkIII  
 Henry SixMix  
 OC White 619003BG  
 Omnix furniture  
 Shure SM-7  
 Tascam CD601MKII  
 Telos NX12  
 Yellowtec Mika

### Bing Lounge

Clear-com intercom system  
 Crown CTS1200  
 Fujinon zoom lenses  
 JBL SRX712M, VP-7215, VP-  
 7212, VPSB 7118sp  
 Mackie Onyx 1640 w/Firewire  
 NewTek TriCaster  
 Proco MS-82P  
 Sharp 155" HD DLP projection  
 system  
 Sony PMW-EX1R  
 Soundcraft GB4-40

### Dealers

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are the corporate offices for Key Bank of Washington and Oregon.

The entire ceiling and HVAC ducting for the lounge is suspended with a 5' space between it and the floor above. The floating ceiling is mounted on shock absorbers and sealed with elastic caulk. The net result is nearly an STC 80 rating of noise isolation from the lounge to the outside, including the offices above.

Several large video monitors are installed along the lounge walls. Some are on the windows facing outward so people on the street can see the performance when the drapes are closed. A 55" monitor at stage right and facing the street is dedicated for Bing to use at all times.



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To feed these monitors and record the performances, three HD video cameras and a Newtek TriCaster video editor, storage and switcher are used. Stage feeds are split to the front-of-house (FOH) mixer and the control room. All the audio and video is transferred to Bing, which archives all the performances.

There is also a green room next to the control room. Rear access is available from behind the building so performers have a more private entrance.

The Bing Lounge was the most expensive individual part of the project, costing nearly \$1 million.

The sound isolation issue in the Bing Lounge was not the only challenge faced during construction. When the floor plans were drawn up, the architects used as-built drawings as the basis of the design. When construction began it was discovered that these drawings were not completely accurate. Some ceiling beams were actually 5" lower than expected in a few places, so ceiling plans had to be modified. Also, some air ducts were not in the as-built locations, so some wiring paths had to be reconfigured.

The floor plate and building exterior skin had a 2" gap between them. This gap had to be packed with insulation and then sealed with a rubberized membrane to provide suitable sound isolation.

There was one undocumented element that worked to Alpha's advantage: Several in-place large electrical conduits (4") were already installed but not in use, so Alpha used them to save some expense.

*Photos by Jeff Allen.*



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### The technology behind Alpha Broadcasting

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## Tips, tricks, hints and more

By Doug Irwin, CPBE AMD

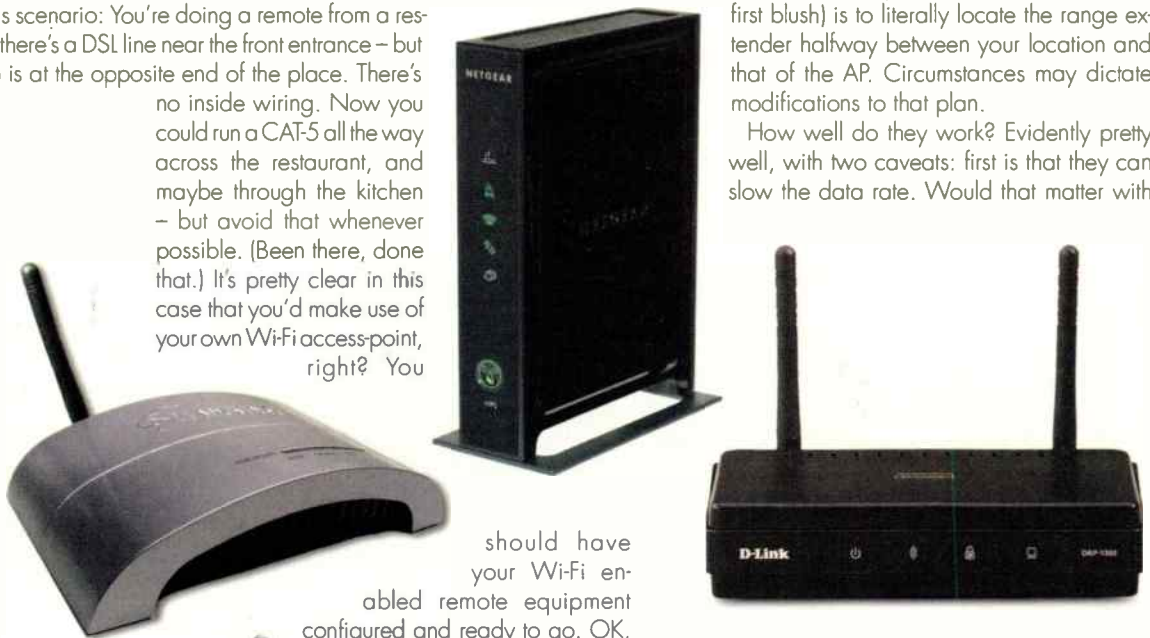
### New options for remotes

Of course if you do remote broadcasts frequently then you know it's important to have not only all the appropriate mics, mixers, headphones, cables and whatnot, but also the other equipment that makes it possible to pull off the impossible in an amount of time that is likely too short. With more and more emphasis on IP-based remotes, what are the new tricks of the trade?

Imagine this scenario: You're doing a remote from a restaurant, and there's a DSL line near the front entrance – but you're set-up is at the opposite end of the place. There's no inside wiring. Now you could run a CAT-5 all the way across the restaurant, and maybe through the kitchen – but avoid that whenever possible. (Been there, done that.) It's pretty clear in this case that you'd make use of your own Wi-Fi access-point, right? You

then re-radiate them. Because this is a duplex communications mode, the same range extender obviously picks up your end of the link, amplifies it, and re-radiates it so that the AP can hear you as well. The way to install them (at least at first blush) is to literally locate the range extender halfway between your location and that of the AP. Circumstances may dictate modifications to that plan.

How well do they work? Evidently pretty well, with two caveats: first is that they can slow the data rate. Would that matter with



**Wireless range extenders from (clockwise from bottom): Linksys (Cisco), Hawking Technology, Netgear and D-Link.**

should have your Wi-Fi enabled remote equipment configured and ready to go. OK, throw this in. There are too many walls in the way, or else there's some sort of interference and your gear can't see the access point (AP) reliably. Now what?

Not to belabor the obvious, but if you buy a Wi-Fi AP for your remote kit, it's a good idea to get one that can accept an external antenna. There are several manufacturers that make external, high-gain antennas. Like any antenna installation (even when it is done on a temporary basis) you should strive to get the antenna up above the ground and as in the clear as possible.

Several different companies make the Wi-Fi range extenders including D-Link, Netgear, Linksys (Cisco) and another that I had never heard of previously – Hawking Technology.

The way the range extenders work is pretty straightforward – they pick up the 802.11 signals transmitted by the real AP, amplify them, and

your IP-based remote equipment? Perhaps. Second, it might be a good idea to get a range extender of the same make as your AP. That way if you have issues making them talk, you can get on the phone with just one manufacturer, instead of two. There's no sense in making your life too hard.

If you consider the Hawking Technology HWREN1 (as an example) you can buy it from Amazon. (The average customer rating was four out of five stars.) That's the best thing about this common networking equipment: You can get it from so many different vendors for cheap.

What about abandoning the 2.4GHz ISM band all together, and going with something that is likely not in use around your remote site? There are several manufacturers making 900MHz ISM band links – and antennas are easy to come by as well. For example, Digi International makes a radio link known as Xpress Ethernet bridge. This link in particular is specified to pass data up to 935kb/s – more than good enough for any of the IP-based codecs out there.

*Irwin is transmission systems supervisor for Clear Channel NYC and chief engineer of WKTU, New York. Contact him at [doug@dougirwin.net](mailto:doug@dougirwin.net).*

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## Omnia One

By Mike Kernen

It's been a long time since I ended the practice of stacking processors in the transmission audio chain. So long that when this need arose I found myself waxing nostalgic about boxes like the Texar Audio Prizm with its requisite Orban card 5 hotrod. I've often added boxes on both sides of the core audio processor: Modulation Sciences composite clippers, Orban XT chassis, UREI 1176s, and the Aphex Compellor, to name a few. Always the goal was to attain dial presence and consistent listenable sound. With digital processors, everything changed. Now the stations' sound could be treated, molded, pumped up and sent – all within one box.

Robert C. Gallagher once mused: "Change is inevitable – except from a vending machine." Audio processors are no exception. DSP advances give processor designers access to ever-increasing power with no end in sight. Like most radio stations, we change processors within reason to remain competitive and to deliver a cleaner more listenable sound to our audience. This too is the goal among processing

RDS input, a distortion cancelled final clipper, and so says Omnia, "the same processing topology that made the original Omnia FM famous."

### Flexibility built in

The One is incredibly versatile. It can be used as a main processor for AM or FM, as an adjunct to a full-feature box, as a studio processor, a multicast processor, or a Web stream processor. It even offers a different firmware load for each such application. Should you decide to repurpose your One, simply download the firmware file for the flavor you now need.

I've chosen to use my processor for yet another task. Arbitron's PPM system offers new challenges to programmers and engineers alike. Of primary concern is the need to present the PPM encoder with an audio signal that is full and consistent. Since my main processors do not have a side-chain I/O where the PPM encoder could be inserted after the AGC, I needed to add something completely separate ahead of the PPM encoder. What I needed was simple audio consistency so I considered many of the old standbys – the UREI, the Aphex, 8200ST and even the old CBS Volumax 410 crossed my mind. Of course none of those would work in this application because our audio chain is entirely AES digital. Furthermore, to use one of those units, I'd also need to add a D/A-A/D converter. This was indeed the wrong approach. A search of the Internet turned up exactly zero modern studio style audio processors with AES-EBU I/O. What to do?

Finally eliminating all of the semi-pro musician

## Performance at a glance

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manufacturers. The full-blown audio processor has become a very complicated, albeit powerful unit where an engineer can find himself bogged down with literally hundreds of controls and options.

The Omnia One is not such a processor. It is designed to lower cost, guesswork, confusion and space requirements. It also offers itself to a variety of applications. The Omnia One can be used as a radio station's main processor: It includes an excellent stereo generator – the same one used in the Omnia 5EX and 6EX, an SCA/



friendly boxes, I discovered the Omnia One. Omnia knows its customers are pros who need professional I/O. Not only does it include AES digital (Radio Systems' Studio Hub compatible), but it also offers balanced analog I/O and can even become a node in an Axia Livewire AoIP network environment. It has an excellent Web-based remote control, is rack mountable, priced right and can easily be configured to ride gain or to rock the house. Its easy to use single-knob control is immediately familiar and the displays are simple, clear and adequately verbose. If that's not enough, did I mention that its sound is first-rate, too? I auditioned nearly every preset and am impressed. The One can be big or small, thick or thin, tall, grandé or venti. I also put the thing on the air for a while and I can say that it really gets it done!

Setting the One apart from its musician-targeted brethren are features like a Web remote interface, user and preloaded factory presets, the ability to store and recall I/O setups, of course the stereo generator and associated composite audio capabilities, automatic input failover, and immediately noticeable is the designer's familiarity with the handsome and professional radio engineer.

I almost feel guilty giving the wholly capable pro-

cessor the prosaic task of riding levels for the PPM encoder. The unit seems almost too good for such yeoman's work. A welcome side effect of its installation is that our programming department loves the sound. I sleep better knowing that the PPM system is now spitting out more codes than ever before. At least that's the theory.

The folks at Omnia are right to point out just how dead center they've hit the bull's eye with the processor. The fact that they've now sold more than 5,000 units speaks not only to the unit's broad appeal, but tells a story of a marketplace that needed this particular product at this price point. You can see why they've chosen the tagline "Everybody wants One!" I suspect I'll always need One more.

*Kemen is the chief engineer of WCSX, WRIF and WMGC, Greater Media Detroit.*

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# Halo Audio

## Affinity Acoustic Control

By Ron Bartlebaugh, CBNT

**T**he science of acoustical control (the controlling of sound waves) for any given room brings with it a multitude of challenges and applicable solutions. Sound waves being invisible presents even greater problems. The acoustical shaping of a room by frequency and time is extremely important for the best aural representation of pre-recorded or live sound. When a room is improperly tuned, the imbalance of certain sounds can mask the clarity of other sounds. A good example is lower frequencies, which typically take longer to decay in many rooms, masking upper mid-

range and high frequency sounds. This makes the sound within the room dull, lacking clarity and intelligibility – defined as the listener's ability to understand the spoken word or detect with precise awareness the detailed definition contained in musical composition.

A professionally engineered acoustical room design will establish parameters that strike a strong balance between sound absorption, reflection, directionality, frequency response, and reverberation time (RT-60). That balance can be best accomplished during the room's pre-construction design phase using size, shape and materials as guidelines. However, and more often than not, acoustical challenges are frequently present in already existing rooms that are far from acoustically perfect.

four Affinity TriPlex Controllers, and two Affinity BiPlex controllers.

The Affinity model AWC-1248 Wall Controller is a lightweight surface-mounted device measuring 12" wide by 4" deep by 47" tall. The Wall



Controller should be mounted in multiple units equally spaced horizontally and vertically on each wall of a room. The unit design contains a solid wood front that measures 9" wide by 45" by 3/16" thick and wood top, bottom and rear panels. FR-701-flame-tested-acoustical-grille-cloth-covered open sides and partially open front allow for each unit to reflect some of the room sound while absorbing and otherwise slowing the sound as it travels along the walls. This process enables the sound to be better controlled as it reaches the room's corners. Each unit contains cotton acoustical batt for sound absorption and consists of an internal horizontal support frame. Mounting flat to the wall surface is accomplished by using the supplied mounting template for positioning two screw anchors per unit into the wall and then placing the unit's rear panel slots over the slightly protruded screw heads. Easy to install wall anchor hardware is provided along with instructions. The only tools that appear to be required for installation are a pencil, measuring tape, and a Phillips screwdriver.

## Performance at a glance

Variety of fabric colors and wood finishes

Custom colors available

Multiple acoustic materials in a package

Simple installation

There are many companies that offer products that can be placed into an already constructed room to establish the control of perceived sound. One is Halo Audio, which offers an engineered line of Affinity Acoustic Control products. For this review, the company provided a version of their pre-packaged Affinity Enhanced Room-Pak, which appears quite applicable for rooms measuring up to 500 square feet.

Contained in the Pak are six Affinity Wall Controllers, four Affinity Corner Controllers,



The Affinity Corner Controller model ACC-448, measuring 4" wide by 4" deep by 47" tall, is identical in construction and mounting procedure to the Wall Controller. Halo Audio's acoustical treatment design calls for mounting one of these units in each corner of the room centered vertically. The use of this product, when properly placed, minimizes standing sound waves in the corners where acoustical energy builds up waiting for more sound to come crashing into the corners. The use of the Corner Controllers greatly improves sound clarity and perceived sound source direction.

The model ATC-16 Affinity TriPlex Controller is a lightweight triangular-shaped unit that measures 16" triangular by 4" deep. Manufacturer recommended application of these units is to place one in each upper corner of the room to minimize sound energy build up in those areas. Each unit comes with an easy to install wall mount bracket and a rear-panel-mounted attachment device. The company suggests the TriPlex Controller mounting bracket be placed approximately 3" below ceiling height for best results.

The model ABC-724 BiPlex Controller measures 4" by 4" by 24" and is a mini-version of the Corner Controller. The purpose of this unit is to control standing wave energy that builds along the corner area between the wall and ceiling. Design recommendations are to mount at least one of these units horizontally where each wall meets the ceiling with placement being centered left to right. For longer walls, multiple BiPlex Controller units may be required.

The published noise reduction coefficient (NRC) for the Wall Controller is 1.15, for the Corner Controller, 1.11, for the TriPlex Controller, 1.08, and for the BiPlex controller, 1.05. NRC frequency specific product test results are available from Halo Audio as are frequency specific absorption specifications using the Sabin measurement reference for acoustical designers who prefer to use that design technique. The products are

available in a variety of fabric colors, wood stain and painted finishes – or custom color matches when stringent architectural designs demand such. Halo Acoustics has various pre-packaged Room Paks available and also offers an accurate acoustical design service.

Overall, the assembled quality of the products in the 15 box Room-Pak kit that was provided for my examination and review appears to be top notch. The product designs use a nice combination of reflection and absorption to achieve a powerful sound control that keeps the listening zone free of stray audio energy. In my opinion, when the correct mix of Affinity Acoustic product is chosen and properly applied to a specific situation, the end results can be outstanding. Listening tests in a pre-treated room yielded less than desirable sound quality with the sound appearing to be coming from multiple locations throughout the room because of uncontrolled reflections and standing waves. There was an obvious reduction in music definition, and an apparent clouding of spectral reproduction. Post Room-Pak installation tightened the room sound and made the room come alive without a feeling of acoustical dampening. The system greatly improved perceived directionality, spectral harmonic balance and imaging. The clarity and definition of the music came to life just like one would expect from the stage of a well-designed and tuned concert hall.

*Bartlebaugh is director of broadcast engineering, WKSU-FM/Kent State University, Kent, OH.*

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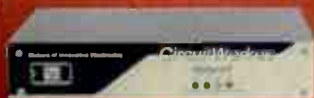
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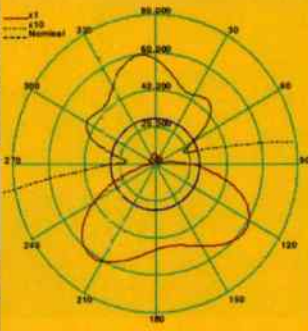
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Senior Associate Editor – Erin Shipp, [eshipp@radiomagonline.com](mailto:eshipp@radiomagonline.com)

### Technical Consultants

contact them via [radio@radiomagonline.com](mailto:radio@radiomagonline.com)  
Kevin McNamara, Computers and Networks  
Mark Krieger, CBT, IBOC  
Jeremy Ruck, P.E., RF and Transmission  
Russ Berger, Broadcast Acoustics  
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Daug Irwin, CPBE AMD; Chris Wygal, CBRE

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[sbell@nbmedia.com](mailto:sbell@nbmedia.com) | 913-461-8073  
Southern Europe, Africa, Middle East – Rafoella Colabrese  
[rcolabrese@broadcast.it](mailto:rcolabrese@broadcast.it) | +39 02 7030 0310  
UK, Ireland, Central and Northern Europe – Graham Kirk  
[gkirk@audiomedia.com](mailto:gkirk@audiomedia.com) | +44 1480 461555  
Japan – Eiji Yoshikawa  
[callems@world.odn.ne.jp](mailto:callems@world.odn.ne.jp) | +81 3 3327 5759  
Asia-Pacific – Wengong Wong  
[wwg@imaschina.com](mailto:wwg@imaschina.com) | +86 755 83862930/40/50  
Classifieds – David Corson  
[dcarson@nbmedia.com](mailto:dcarson@nbmedia.com) | 866-572-6156

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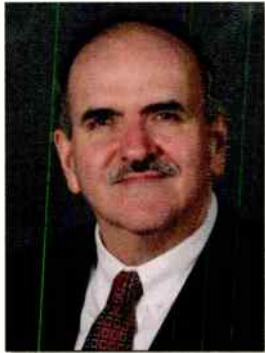
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## Contributor Pro-file

Meet the professionals who write for **Radio** magazine.

This month: **Field Report**, page 64.



**Ron Bartlebaugh, CBNT**  
**Director of Broadcast Engineering**  
**The WKSU Stations**  
**Kent State University**  
**Kent, OH**

Bartlebaugh's broadcasting career began in the mid-60s at a small station in Western Pennsylvania. He has been the director of broadcast engineering for the WKSU network of stations since 1990 and previously served eight years as chief engineer for Moody Broadcasting's WCRF-FM in Cleveland. He is a frequent contributor to *Radio* magazine and author of the *SBE Certification Handbook for Radio Operators*. He also specializes in acoustical analysis and design for studios and houses of worship.



Written by radio professionals  
 Written for radio professionals

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by Erin Shipps, associate editor

## Do You Remember?

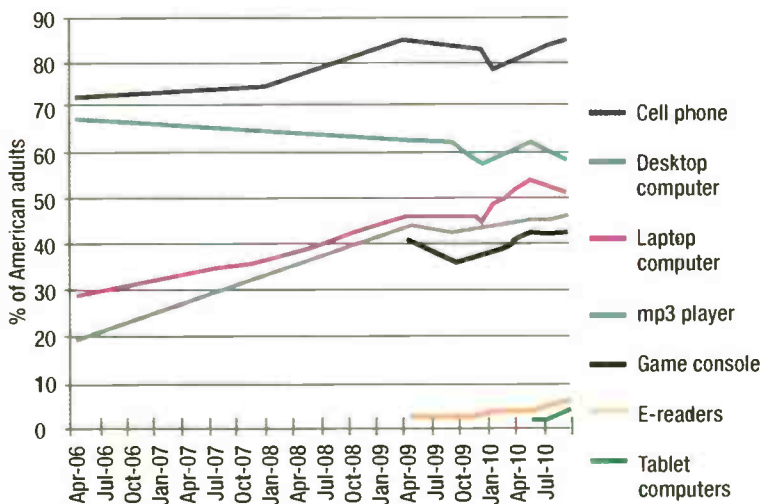


In a press release, Glensound announced that, Manx Radio has used one of its original Glensound mixers for the last time after 33 years of service. Manx Radio is a commercial radio station on the Isle of Man and was established in 1960. The station ordered several MX6/3 mixers in 1977. The mixer also featured a DK20 mono monitoring pod that has been used in a modified configuration to give a mix of headphone feeds to the commentators and backroom staff. Manx Radio has a collection of MX6/3s in various states, having raised two for spare parts to keep its main pair operable and on air. These six-channel mixers are used daisy chained together to give 12 channels that are used for the broadcasting of the Manx Grand Prix races on the Isle of Man. The mixers were used for the final time at the end of August 2010 for the Manx Grand Prix.

## Sample and Hold

### Generations and their gadgets

Gadget ownership by American adults, 2006-2010



Source: Pew Internet

According to [pewinternet.org](http://pewinternet.org), many devices have become popular across generations, with a majority now owning cell phones, laptops and desktop computers. Younger adults are leading the way in increased mobility, preferring laptops to desktops and using cell phones for a variety of functions, including Internet, e-mail, music, games and video. Cell phones are by far the most popular device and taking pictures (76 percent) and text messaging (72 percent) are two non-voice functions widely popular. Millennials are the only generation more likely to own a laptop or netbook as opposed to a desktop computer. Also more popular with Millennials are MP3 players. While 74 percent of adults age 18-34 own an MP3 player, only 56 percent of 35-46-year-olds own them. And while tablet computers (such as the iPad) are most popular with adults under age 65, only 4 percent of all adults own this device.

*\*In this chart, the dips in tech ownership registered in the September 2010 survey are mostly a result of the fact that Spanish interviews were added to the survey. Most of the Pew Internet surveys before 2010 were only conducted in English. The Project has added Spanish to this survey and that knocked down the overall tech-ownership numbers in some instances because respondents who wanted to be interviewed in Spanish were somewhat less likely than others to be tech non-users.*



# ARRAKIS SYSTEMS INC.

## MARC-15-15

on sale \$6,499



15 channel modular console supports two phone hybrid, USB sound card modules: control room & studio

## ARC-8

only \$799



2 mic, 4 stereo line, PC USB, and Phone input both balanced & unbalanced I/O

**XTREME**  
automation  
only \$100  
per month

Live On Air,  
Hard disk & Satellite,  
16 stereo input switcher  
with logic

## ARC-15

only \$3,495



1-5 mic inputs,  
PC USB, and Phone inputs  
both balanced & unbalanced I/O

## ARC-10

three models



ARC-10U: \$1,599 unbalanced  
ARC-10UP: \$1,999 unbal w/ USB  
ARC-10BP: \$2,495 balanced w/ USB

2 mic inputs,  
PC USB, and Phone inputs,  
both balanced & unbalanced  
models.

## 'ACCENT' studio furniture



all ARC consoles feature  
built in PC USB sound cards  
and come with 'Xtreme -Studios'  
live on air software

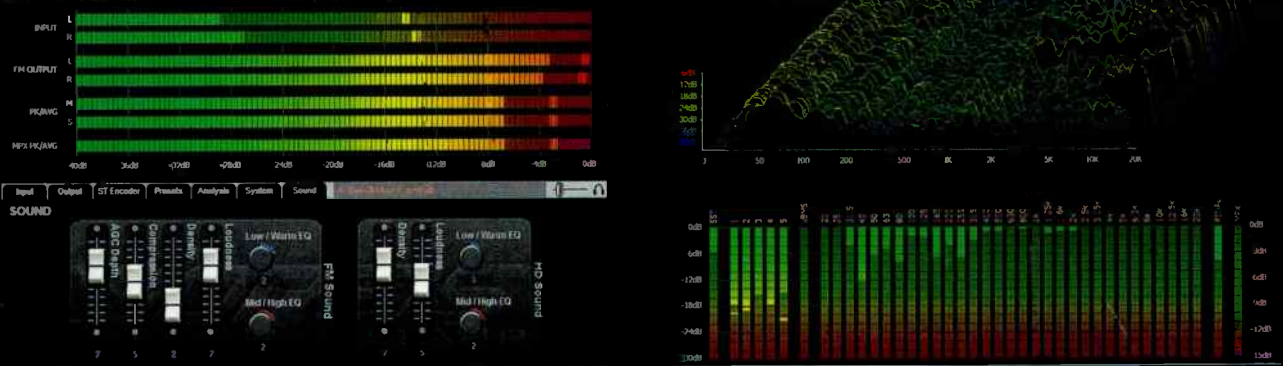


ACCENT is a contemporary blend of brushed metals, pleasing colors, and interesting textures. The metal structure is artfully integrated into the visible design decor of the cabinetry. Cabinetry and electronic equipment complement each other to create a bold visual environment for talent, guests, and clients alike.

[www.arrakis-systems.com](http://www.arrakis-systems.com)

all prices are msrp

# VORSIS AIRAURA DIGITAL SPECTRAL PROCESSOR



"I am giving the Vorsis development team a BIG thumbs up as this product stands out as a very SUPERIOR audio processor design."

"This processor is amazing!"

"I have the HD output feeding our web stream encoder, and two national program hosts at remote locations in the US have told us 'your audio stream sounds incredible!'"

"I can say that the Vorsis processor does NOT sound like the "O"ther guys! It sounds far better and has a very unique 'signature'. I really, really like how this processor sounds! Every other station in the market sounds like crunched up FM radio while our station is loud now and yet it still has "life" with CD quality dynamics and punch."

"I've listened to the station since the first few days after the format flip (which was a month ago yesterday), and the one thing I notice most is that the new Vorsis processor's audio quality is always terrific, regardless of the source material."

"If the Vorsis that I heard while you were testing processors last night is your final air chain (it was) it might just be the cleanest and best sounding FM I've heard since...well, forever. Great work!"

"Thanks for a great sounding box that makes us sound bigger than the so called big stations!"

"Your Sweet Spot Technology AGC has the most invisible gain correction that I have EVER heard in ANY on air processor. Listeners have been calling to compliment us on the improvement in our on air sound."

"We've used your product close to a year now and it's just out of this world. When we put the Vorsis box online our audience noticed the difference instantly and started calling asking questions like 'What's going on? What did you all do? Your sound is clear, crisp, and bright and the audio sound level is great now!!!"

"The music sounds great, and this box can be tweaked to anyone's preference. There is a lot to discover in this machine....but our single biggest achievement has been achieving the clearest, cleanest 'voice' I have ever heard come from an FM processor."

## Real Comments From Real Users About Vorsis

### Just wait until they get their hands on AirAura™



IT'S TIME YOU WON THE RATINGS WAR

phone 1.252.638-7000  
www.vorsis.com | sales@wheatstone.com

"I am extremely impressed with the unit's capabilities and how well it performs with our NPR talk/Classical format."

"What an amazing difference in sound quality!!! This is a brand new FM station and comparing it to the other new station in town using the Other brand of processor our client is louder, cleaner, and even legal. Wheatstone definitely has a winner here with Vorsis."

"This is a great sound and we are so, so pleased with our new Vorsis on-air processor. You just threw down the gauntlet to the processing industry with this new unit! Nobody can match a sound this loud, this clean, and this unique! Now everybody gets to chase after us for a while. Thanks Vorsis!!"

"Our signal used to virtually disappear in downtown New York when we went on night pattern because of the extremely high level of man-made noise. Now when we're on night pattern our coverage in downtown is actually better than when we are on day pattern, the other brand of audio processor and a 10X higher powered transmitter! We're buying a second one to put on our daytime transmitter!"

"You have to be kidding! I have NEVER heard FM audio sound this good, this detailed, this smooth, this clean, and this loud (how did you do it???) Very nice work!"

"Love the box!!! Overall the sound of the station is vastly improved. It's loud, wide and clear."

"I guess the only word for Vorsis is 'WOW'. It's got some great bottom end, and it's more transparent than any processor I've heard."

"The AGC/Compressor/SST combination is simply amazing. We play classical CDs. Older classical CDs were mastered at a much lower level than current ones. Announcers don't compensate and never will. Your processor is able deal with what amounts to probably 40-45dB (or more) "average" level variations and hold them perfectly in the sweet spot with virtually no squashing, pumping, sucking, or other usually audible artifacts of such wide range level control. In short it does its job perfectly every time."

"This box sounds much better than any other processor I have ever tried. Ever!"

"I love classic rock and it's the program format on the station that I own. No other processor that I've tried (and I think I've tried them all!) sounds as good on this format. We're nice and loud and still cleaner than the other stations in the market. We were surprised to hear the intentional dynamics of songs actually get on the air - other processors just flatten them out or turn them into a sea of mush. For the first time ever we're also hearing subtle nuances in songs that we used to think we knew every single note of. What an amazing air sound! No.... What an amazing processor!!"

"Your equalizers are actually useful and unlike other processors do not grunge-up the sound merely by enabling them."

"The SST algorithm is the least audible of ANY processor I have ever had experience with. I'm not sure how you did it or exactly how it works but its automatic "leveling" is excellent - no pre-processing whatsoever is necessary with SST."

"The high end of this processor is very open sounding - there is no fake "sparkle" with the HF EQ either. Perfectly clean and natural sound. And did I mention LOUD?"

"Finally! A processor that deals effectively and transparently with overly-sibilant announcers and audio levels that usually go all over the place! (I especially love the tweak-able multiband thresholds!)"

"Why haven't the other audio processor companies been able to make an AM box that sounds this good? I can't think of a positive superlative that is big enough to describe how pleased I am with our AM sound now. Our coverage seems to have increased by quite a bit too!"

"Our multipath is Gone! GONE! As an engineer I have difficulty believing a processor can make this much difference in apparent coverage area but the listening is the proof. We've had several listeners call and comment that their reception has greatly improved and even I've noticed vast improvements when driving through what were previously horribly multi-path prone areas. I'm not sure why, but it sure does work!!"

"This box has great metering and excellent analytical tools - you get good visual indication of everything that is happening inside."

"The unit's stability has been flawless, not even a tiny glitch. We have it set up to time-sync and it works great. The scheduler-based (and SILENT!!) preset switching is perfect! Unit sounds very accurate sonically and is very easy to set-up."

"We are now VERY unique in our audio. Compared to other stations in the market, we are as loud yet maintain legal modulation (at least 4 stations in our market run with 130%+ modulation). We're not "squashed" sounding at all and if you compare us with the other stations (all formats) we're clearly a dynamic and clean stand-out signal on the dial now."

NOTE: We aren't naming names because everyone who is reaping the rewards of sounding better appreciates their anonymity (with respect to the competition). We won't blow your cover, either.