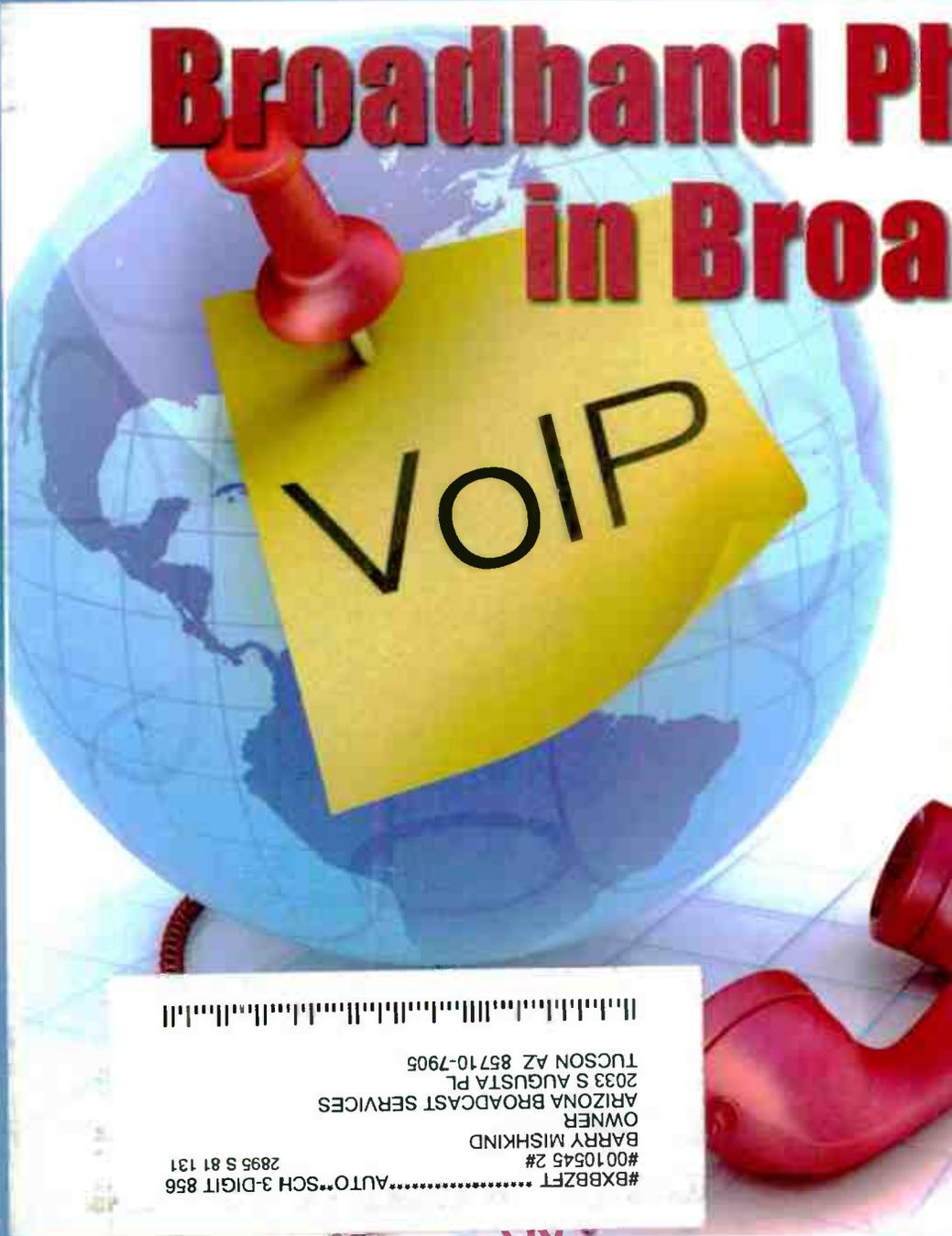


# Radio

THE RADIO TECHNOLOGY LEADER

May 2011  
RadioMagOnline.com

## Broadband Phones in Broadcast



Are they  
the future?

### FACILITY SHOWCASE

Helping the Hawks  
hit the airwaves

### FIELD REPORTS

Electro-Voice  
RE320 & Yamaha  
Stagepas 300



#BXBZFT .....AUTO\*\*SCH 3-DIGIT 856  
#0010545 2#  
2895 S 81 131  
OWNER  
BARRY MISHKIND  
ARIZONA BROADCAST SERVICES  
2033 S AUGUSTA PL  
TUCSON AZ 85710-7905



Make the Switch to **Presenter** Now...  
We'll Convert Your Audio and Data For Free!  
**Presenter**, The Ultimate 'Live & Local' Studio System.



When Playing Audio Really Matters.  
(800) ENCO-SYS



www.enco.com



# SPEND THE SAME, BUT SAVE!

There has been a rumor going around that WheatNet-IP Intelligent Network is more expensive. Really??? NOT SO! We're here to say categorically - WheatNet-IP Intelligent Network is NOT more expensive. Some of our components may cost a bit more but are way smarter, can do far more, and eliminate expenses that less intelligent networks still need. While it's easy for others to make selective comparisons, when you add up all the costs for your network, WheatNet-IP comes out to just about the same money as the other guys. No marketing mumbo jumbo about your labor or performance here - we're talking straight hardware comparisons. Go ahead - configure your network and see. Of course we DO out-perform them by up to a factor of ten. And we DO save you great goobobs of money by giving you a system that configures, runs and heals itself... Still, do a full-network hardware comparison and check it out for yourself! Operators are standing by...



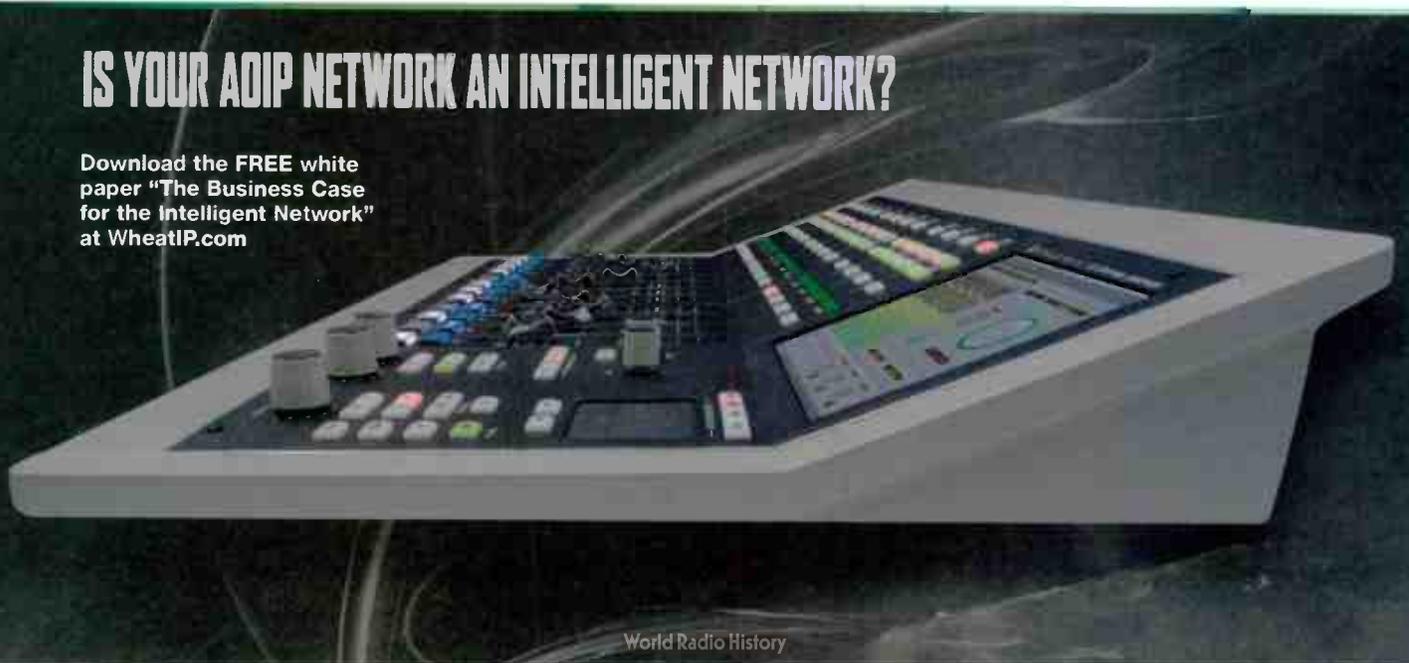
**THE INTELLIGENT NETWORK™**

phone 1.252.638-7000 | [WheatNetIP.com](http://WheatNetIP.com) | [sales@wheatstone.com](mailto:sales@wheatstone.com)



## IS YOUR ADIP NETWORK AN INTELLIGENT NETWORK?

Download the **FREE** white paper "The Business Case for the Intelligent Network" at [WheatIP.com](http://WheatIP.com)



# RUN YOUR BUSINESS MORE EFFICIENTLY

“**WO Automation for Radio is a great system. It's reliable, easy to use and has vastly improved our stations' efficiency and our ability to produce even better quality programming for our listeners.**”

— RICK ARMON, Operations Director, Good Karma Broadcasting

## INTRODUCING WO AUTOMATION FOR RADIO 3.0

The industry's most powerful and modern radio automation solution delivers:

- Easy-to-learn touchscreen interface with customizable DJ workspace
- Powerful search and voice tracking capabilities
- Patented Leader and Follower technology: effortless multi-station and multicasting capabilities

## SEAMLESS INTEGRATION

WO Traffic and WO Automation for Radio deliver:

- **Live log between traffic & automation** minimizing errors
- **Real-time reconciliation and notifications** when a spot plays or is missed
- **Streamlined dubbing process** and automatic run date synchronization
- **Remote access**—for ultimate control, from anywhere!



DRIVING THE BUSINESS OF ADVERTISING

QUESTIONS? PLEASE CONTACT: MIKE ZINSMEISTER, VP SALES  
OFFICE: +1.828.252.8891 | MOBILE +1.828.712.2843 | MIKEZ@WIDEORBIT.COM

World Radio History

# CONTENTS

22



10



34



## Features

- 14** Trends in Technology: VoIP phones  
by Joe Talbot  
Using the new standard in phone service in your studio
- 22** Facility Showcase: Philips Arena  
by Michael Gay  
The Atlanta Hawks get a Cumulus/Dickey makeover
- 32** Tech Tips  
by Doug Irwin  
Using the ULS database

## Columns

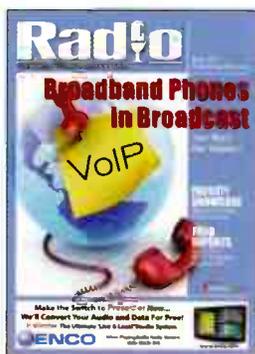
- 8** Viewpoint  
by Chriss Scherer  
Your role in customer service
- 10** RF Engineering  
by Jeremy Ruck  
Tower maintenance
- 12** FCC Update  
by Lee Petro  
Nondiscrimination certification raises questions

## Departments

- 6** Online  
at www.RadioMagOnline.com
- 34** Field Report: Electro-Voice RE320  
by Dan Israel
- 36** Field Report: Yamaha Stagepas 300  
by Gil Wilson
- 38** New Products  
by Erin Shipp
- 48** Classifieds
- 49** Contributor Pro-File  
Meet Michael Gay
- 50** Sign Off  
by Erin Shipp  
The latest stats from BIA/Kelsey

### ON THE COVER

Bringing broadband into the broadcast studio is quickly becoming the method of choice for telephone systems. Find out how to implement this technology starting on page 14.



# 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".

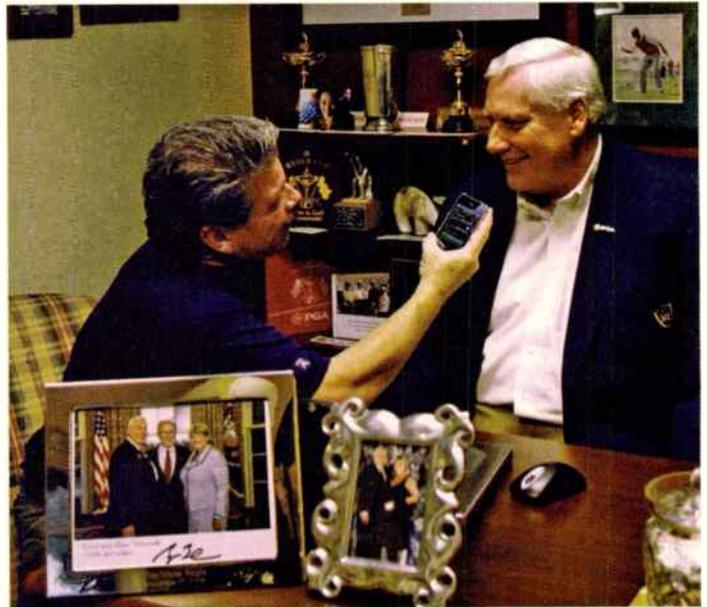
When interviewing hundreds of professional athletes in the past I had to make sure that I had my cassette recorder, mike, fresh cassettes, batteries and headphones with me at all times. More than once, something would be missing. I'd eventually get the interview, but all the equipment was a burden and 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"  
Interviewing Allen Wronowski, President of The  
PGA of America with Tieline's Report-IT



For a FREE demo  
call 317-845-8000  
or email [sales@tieline.com](mailto:sales@tieline.com)

**Tieline**   
TECHNOLOGY

[www.tieline.com/report-it](http://www.tieline.com/report-it)

\*iPhone is a registered trademark of Apple Inc., registered in the U.S. and other countries.

World Radio History

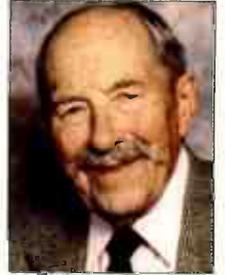
# CONTENTS

## Currents Online

Selected headlines from the past month.

### SBE Renames Lifetime Achievement Award to Honor John Battison ➔

The former *Radio* magazine technical editor is honored by the society he founded.



**Battison**

### Firm Claims Patent Ownership of Radio Automation

An agent for Mission Abstract Data is contacting broadcasters to negotiate licensing terms.

### Enco Appoints Backus as General Manager

Don Backus joined Enco Systems in March 1999 as sales manager and has been VP of sales and marketing since January 2000.

### The *Radio* magazine Pick Hits of the 2011 NAB Show

15 products were chosen by the *Radio* magazine Pick Hits panel.

### Clark Wire and Cable Appoints Bernd as National Sales Manager

Ken Bernd was the inside sales manager at Gepco for 21 years.

### NRSC Adopts Updated RBDS Standard

Notably, this new version includes support for the latest RadioText+ technology, some new Program Type (PTY) codes, and a new optional method for Program Information (PI) code generation.

### Kelly, Lebermann and Thomas Elected SBE Fellows

Charles Kelly, Arthur Lebermann and Barry Thomas have been elevated to the SBE's highest membership honor.

### 2011 NAB Show Attendance: 92,708

Attendance was up more than 4,600 from 2010.

### Two Die in Fall from Indiana Tower

Ernesto Garcia and Paul Aliff were contracted by ERI.

## 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.

We'll award a different prize from Hosa each month during 2011.

This month, enter to win a Hosa USX-100 mic-to-USB interface.

Enter by June 10. Send your entry to [radio@radiomagonline.com](mailto:radio@radiomagonline.com)

Include your name, job title, company name, mailing address and phone number.

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

No purchase necessary.  
For complete rules, go to [RadioMagOnline.com](http://RadioMagOnline.com).

## Site Features

### NAB Show Photo Blog

Check out the 2011 NAB Show through the lens of the *Radio* magazine staff.

### 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.

### 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.

### Industry Events

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



# SMART:



JetStream MINI IP Audio Networking System

Logitek Jetstream IP audio networking is smart and our lineup of surfaces gives you more choices. JetStream MINI covers all your console and routing options whether it's for a large standalone console, a smaller desktop control surface or aspace-saving virtual controller.

You decide what's best for your operation. With JetStream IP audio networking, it's all about smart choices.

**Next generation 'smart' IP audio.** JetStream supports the latest IP and Ethernet protocols for affordable, easy and ultra-fast audio networking.

**More I/O choices for all sources and destinations.**

Just one JetStream MINI handles 64 digital or analog inputs/outputs of your choice and up to four Logitek control surfaces or vScreen virtual controllers of your choice. **Choose what you need.** Everything you need is in one user-configurable, 64-channel node.

Your JetStream can have mic inputs, line-level and digital I/O, built-in EQ, dynamics and imic processing, profanity delay, GPI/O, Internet codecs, WAN support, automation interface, battery power and a whole lot more.

**No computer science degree needed.** JetStream IP audio networking is super easy to set up with built-in memory and automatic configuration. Just plug in and let JetStream do the rest.

**Affordable and flexible.** Regardless of studio size, Logitek's smart architecture allows you to get more done for less.

Complete systems start at under \$6000.

# CHOICES:



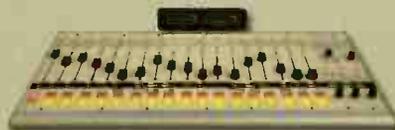
Artisan



Mosaic



Remora



Pilot



vScreen



## Your role in customer service

**T**he phrase "customer service" typically invokes an image of someone manning a counter position at a retail store or an individual with a telephone headset at a call center. This is the consumer view of customer service representatives, but the customer service phrase itself is not limited to addressing dissatisfied consumers. Regardless of your job position, you work in some form of customer service.

It may not seem obvious, but everyone serves a customer. For a contract engineer, the customer is mostly obvious. The station paying the contractor's fee is the customer. But even the contract engineer has less obvious customers.

Are you an on-staff station engineer? You may think you have no customers. You report to your supervisor and rarely have contact with listeners. This may be true, but your customers are all around you.

The people we report to are our customers, but so are the people we work with. And customer service isn't just addressing problems and concerns; it's ensuring the service you provide is satisfactory.

This was all brought to mind recently by a situation in which a company's website was being transferred from one server to another. The transfer wasn't simply relocating data, it involved installing and configuring an entire content management system as well. As I observed the process I realized the same experience could be applied to changing a station's automation system, building a new studio facility and even planning a remote.

In the case of the website transfer, the communication between the site developers and content posters was one-sided. It appeared the site developers did not view the content posters as their customers in any way. The developers provided information to the users, but the communication was completely informational. There was little (if any) understanding on the developers' part to first understand the needs or schedules of the users. The information provided was straight facts and a hard timeline.

We all have time schedules, and when two departments must work together, there has to be some negotiation of time to benefit both sides.

Coordinating mutually acceptable schedules is but one step in good customer service. Granted, it's not always possible to perfectly accommodate everyone's schedule, but some common ground can be found.

As this specific project continued, short time schedules were just one of the issues. During the transition, the users were required to essentially do their work twice by posting material in two places (to the live site and the future site). There were other issues, but I think you get the idea that the project was not the smoothest from the users' point of view.

In most cases, communication is the simplest aspect of good customer service. While it's not necessary to share every minute detail of a project with everyone involved, sharing no information at all is a sure way to ensure failure. Find a balance in too much or too little information.

A more difficult aspect of good customer service is understanding the needs and concerns of the other people. We know our own jobs very well. We probably don't know other peoples' jobs that well. But understanding how they do their work can help you do yours.

When I was the chief engineer at a station I would ask to pull an air shift once at least every six months. This allowed me to use the studio and gain a better understanding of its operation. It also let me observe the little nagging issues that others were putting up with because no one bothered to notify engineering.

That small effort improved my customer service skills. What do you do to improve yours? 

*Chris Scherer*

# The World's Most Popular IP Codec...



## ...Is Now Even Better!

Introducing

# ACCESS 2USB

Get the story wherever you are with more ACCESS than ever before. ACCESS 2USB now gives you two USB ports, support for select 4G Wireless USB modems and now includes MPEG-4 AAC Coding Algorithms standard! The best just keeps getting better and better!

IP • 3G • Wi Fi • 4G • BGAN | VSAT • PSTN • DSL



# Tower maintenance

By Jeremy Ruck, PE

As engineering budgets get stretched thinner and thinner, there seems to be a tendency to concentrate efforts at the studio at the expense of the transmitter facility. Neglecting the transmitter site, and tower in general can have catastrophic effects. Many large market stations are privileged to have multiple sites, but in the small- to medium-sized markets, the failure of vertical real estate results in not only a large reconstruction budget, but also the potential long term hemorrhaging of money.

First and foremost in any tower maintenance program is to build a solid relationship with a tower crew; and you get what you pay for. The crew that performs the work for bargain basement prices may tend to have greater personnel turnover, and lower experience and quality levels. This tends to limit continuity between visits, and reduces the opportunity for your crew to observe trends in a particular structure over time. If unsure about the skill or reputation of a crew, seek out your colleagues in the market or region.

## Set a plan

Once your crew is lined up, it is a very good idea to meet with the supervisor and discuss your maintenance program. Meeting face-to-face enhances the comfort zone and puts all parties on the same page. Face-to-face communications also sometimes jog memories too, so an opportunity to share historical information about a site is gained. The passing of this knowledge may wind up being crucial down the road to preventing a failure.

In general, consultation with a structural engineer is probably unnecessary for routine tower maintenance. Obviously if items outside of the design criteria are to be added to the structure, a review by an engineer is necessary. Similarly, if a routine inspection uncovers out

of the ordinary items such as broken bolts, foundation failure, etc., a reputable structural engineer should be called in as soon as possible to review the findings and recommend a necessary course of action.

Two other persons should form your tower maintenance team: The first is a competent antenna engineer. This person does not necessarily need to be in close proximity to you, but he or she

should be readily available for consultation and fieldwork if necessary. The final member of the team is of course the station engineer, who has the most frequent and regular contact with the structure. The engineer should be making cursory examinations, but these are never a substitute for a full-blown inspection.

The frequency of a more in-depth inspection can vary depending on the nature of the site. A naked tower that is a member of an AM directional array in the middle of a cornfield may not need to be fully inspected as often as an older, fully loaded tower in a densely populated area. Regardless of what schedule you utilize to maintain and inspect the tower, it is usually a good practice to have the tower climbed at least once per year. However, exposure to earthquakes and severe storms, etc., might affect the integrity of the structure and will necessitate a greater climbing frequency.

Most tower companies follow a checklist when performing inspections. At a minimum your report should include details about the physical condition of the tower, including mounting hardware, connections, foundations and guy anchors if applicable. Also included in the physical condition should be comments on the paint or galvanizing as applicable, the tension and condition of guy wires, and alignment, that is plumb, of the tower. On the electrical side, issues with grounding, conduits and lighting should be investigated. For the RF portion, visible physical damage and anomalies to antennas, transmission lines, waveguides, insulators and skirts should be noted. In all cases, your crew should be ready and willing to provide adequate documentation including a robust quantity of photographs, which will ultimately protect both parties involved.

Inspection items uncovered during a climb may or may not be rectifiable during the current visit by the crew because of materials and/or personnel. Such items should, however, not be relegated to the back burner. Make necessary corrections at the earliest possible opportunity, which will probably reduce future catastrophes.

## Not just a slap of paint

Perhaps one of the planned activities for tower maintenance that tends to be delayed or neglected is that of painting. A reasonable frequency of painting is probably every five to seven years. In certain environments, especially those that are



Photo by Frederick Noronha. Used under a Creative Commons license.

corrosive due to ambient salinity from oceans or industrial pollution, this interval may need to be shortened considerably. Painting serves not only the obvious end of increasing structure visibility, but also provides a protective coating to the tower material. Failing to adequately maintain the paint on the tower increases the likelihood of aeronautical accidents or failure of the structure from corrosion.

Also often neglected is the removal of obsolete items from the structure. Sometimes these items belong to the station, but more often than not, they were installed by another tenant. Vertical real estate tenants sometimes have insufficient respect for the tower owners, and may consider your tower their own personal landfill. This situation can typically be avoided through appropriate language in the lease or licensing agreement they sign for use of the tower, but despite your best actions as a structure owners, some still slip through the cracks and the onus of removal falls to you.

Portions of the structure that lurk below ground can also sink the ship that is your station. Due to the significant increases in technology, equipment at the transmitter site can be just as susceptible to lightning as that at the studio. The necessity of instilling and maintaining proper grounding cannot be understated.

Appearances can also be deceiving with guy anchors. This topic has gained a lot of attention in recent years due to spectacular failures, or the identification of impending failures. Although the anchor may look just fine above ground level, the portion below ground, or in concrete, may be a failure waiting to happen. All sites are at risk of galvanic corrosion of the guy anchors; however, those in proximity to pipelines face a much greater risk. Pipelines tend to charge their systems so that everything is deposited on pipeline as opposed to the reverse where the pipeline is deposited on the guy anchors. This means that guy anchors, and even ground systems, wind up migrating to the pipeline. This situation can be rectified through various schemes that employ a sacrificial anode. These systems, however, require maintenance, but are much cheaper to replace than towers.

With some forethought and prior planning, you can significantly reduce the potential of that dreaded phone call. While proper tower maintenance will not prevent all failures, it will certainly go a long way towards reducing their potential of occurrence.

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

## How can Shively Help You?

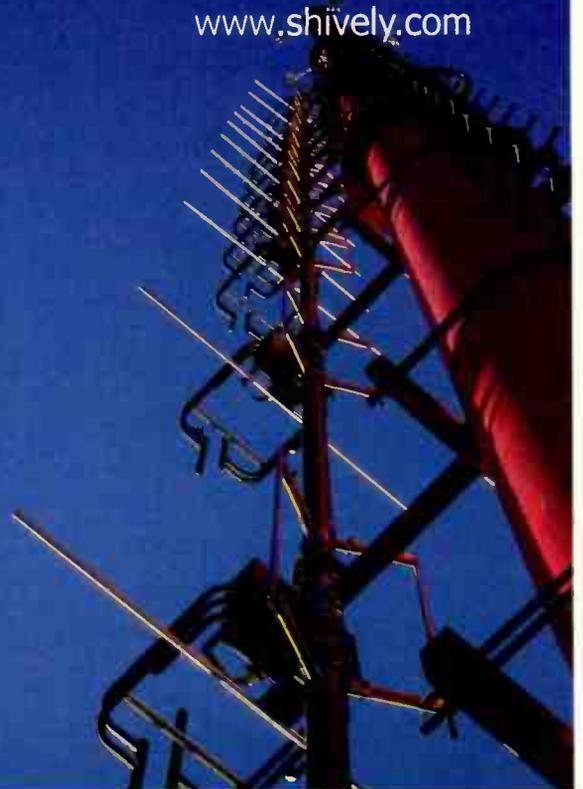
- Pattern Work
- Antennas
- Filters
- Coax



## Shively Labs®

(888) 744-8359

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



# Nondiscrimination certification raises questions

By Lee G. Petro

In the March 2011 FCC Update I discussed the certifications all applicants must make when filing applications for license renewal (FCC Form 303-S). I briefly referenced a new certification that required applicants to certify that their advertising contracts did not discriminate on the basis of race or ethnicity. Recent pronouncements by the Commission, however, require a more thorough review of the nondiscrimination policy certification to be made in the renewal application.

The nondiscrimination policy relates to the FCC's 2007 Diversity Proceeding, in which the Commission sought to end the reported practice of advertising agencies issuing "No Urban/No Spanish" dictates. The Commission concluded that such practices were discriminatory, but acknowledged it had limited jurisdiction over advertising agencies. Instead, the Commission focused on broadcast stations, and determined it would require broadcast stations to certify compliance with the new nondiscrimination policy when they filed their renewal of license applications. At the time, the Commission did not provide any guidance as to how broadcasters should come into compliance with the new policy, the timing of when the new policy would be effective, or how the new policy would be enforced in the next renewal cycle.

*casters must have a reasonable basis for making this certification. If the response to Item 7 is "no," please attach an exhibit explaining the persons and matters involved and why the matter is not an impediment to a grant of this application.*

Further complicating matters, the Commission released a public notice on March 14, 2011, announcing the effectiveness of the new version of the renewal form, indicating that the non-discrimination policy was effective as of that day. Additionally, the Commission stated that all broadcasters must certify in their renewal application whether they were in compliance with the new policy as of March 14, through the end of the license term.

Because the Commission had not previously stated when the new policy would be effective and how it would be enforced, the Public Notice caught many flat-footed. One week later, the Enforcement Bureau issued an advisory indicating that if an applicant was unable to certify compliance with the nondiscriminatory policy in its renewal application, the Commission's staff will review the explanation when "determining whether to renew the license."

With the relative dearth of official guidance it makes sense for broadcasters to, at the very least, take the following steps: (a) adopt a no-discrimination-in-advertising policy statement and include the policy statement in their employment manuals; (b) use their best efforts to confirm that advertising aired by the stations was not obtained by or from a person or entity with the intent to discriminate; and (c) insert a clause in all advertising contracts/orders notifying the advertiser of the station's nondiscrimination policy. Also, since most time brokerage agreements, joint sales agreements and other programming agreements also have advertising provisions, broadcasters should review the agreements and consider taking steps to come into compliance with the new policy.

Finally broadcasters should send notifications to their "handshake deal" advertisers that the policy statement has been adopted, posting the policy statement on their website, and including the policy statement in their correspondence with advertisers, as well.

It will be important for broadcasters to retain documentation of their efforts so that they can demonstrate a reasonable basis for making their certification in the renewal application. Future FCC updates will address any additional announcements by the Commission.

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

## Dateline

May 15: Radio stations located in the District of Columbia, Maryland, Virginia and West Virginia continue to run license renewal pre-filing announcements.

June 1: All Radio stations located in the District of Columbia, Maryland, Virginia and West Virginia file license renewal application and EEO Program Report. Non-commercial radio stations also file Biennial Ownership Report (FCC 323-E).

June 1: Radio stations located in the District of Columbia, Maryland, Virginia and West Virginia run license renewal post-filing announcements on June 1 and 15, July 1 and 15, and Aug. 1 and 15.

June 1: Radio stations located in North Carolina and South Carolina run license renewal pre-filing announcements on June 1 and 16, and July 1 and 15.

With the upcoming renewal cycle, the Commission modified the Renewal Form (FCC Form 303-S) to include the following certification: *Commercial licensee certifies that its advertising sales agreements do not discriminate on the basis of race or ethnicity and that all such agreements held by the licensee contain nondiscrimination clauses.* The instructions to the Renewal Form provided only slightly more guidance as to what was required of broadcasters: *Prohibited discriminatory practices include "no urban/no Spanish" dictates. Broad-*

Drops jaws. Not audio.



Broadband Internet is everywhere. Which makes it ideal for live remotes.

Unfortunately, the internet is also notoriously erratic. Even if you're lucky enough to get a good connection, it might deteriorate during your show. So you dial back the bitrate, sacrificing sound quality to play it safe.

There is a better way.

Meet the amazing new Z/IP ONE codec.

Telos and Fraunhofer collaborated to develop a unique coding algorithm that adapts to changing network conditions on-the-fly.

If your connection quality drops, the Z/IP ONE uses error concealment, elastic buffers, and bitrate adjustments to keep audio flowing at maximum quality.

The Z/IP ONE now makes it possible to use the internet for great sounding remotes.

The convenience of the Internet. The sound of Telos.

AUDIO | NETWORKS  
[www.telos-systems.com](http://www.telos-systems.com)

© 2010 - 2011 Telos. Zephyr, Z/IP ONE and Z/M ONE are trademarks of Telos Corp.

#### BROADCAST TELEPHONY



Telos is the trusted World Leader in single-line hybrids and multi-line phone systems.

#### ZEPHYR IP & ISDN CODECS



With more than 20,000 in daily use around the world, Zephyr is The Best Way to Hear from Everywhere.

#### STREAMING AUDIO



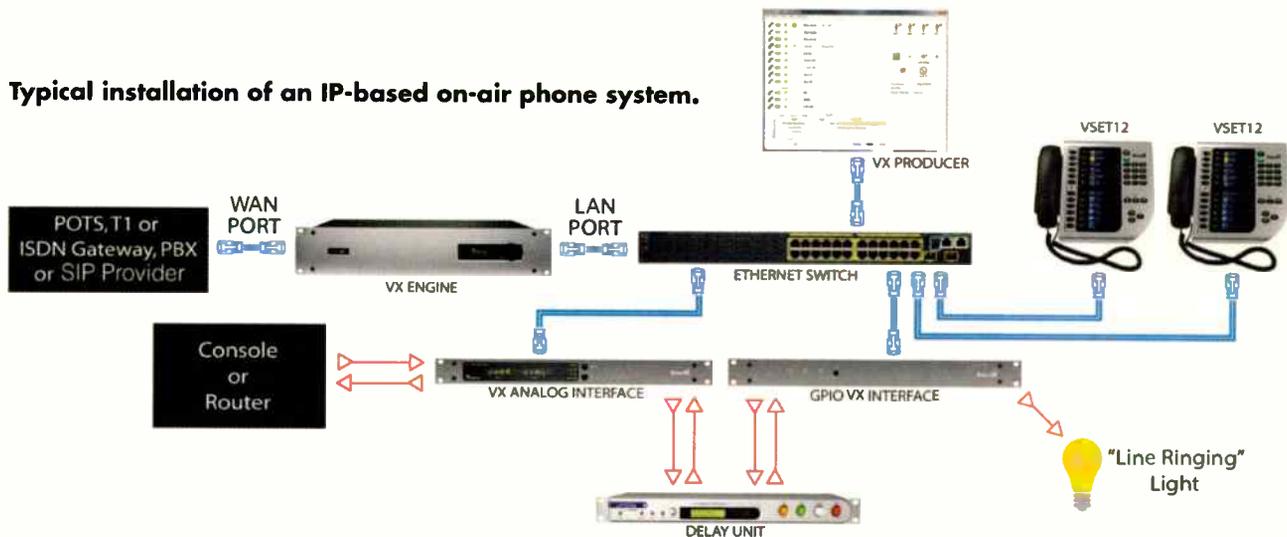
Hardware and software products for processing, encoding and streaming your audio content.

#### AUDIO LOGGING



PC Software for archiving and logging all of your stations audio.

### Typical installation of an IP-based on-air phone system.



### VoIP advances

As time went on, VoIP was used more and began to perform better and better. While issues remain, it's now beyond simply being merely viable and is well on the way to becoming the standard. In other words, if you ask your phone provider about SIP trunking these days, the likelihood of the response being a blank stare is far less than in the recent past, and far better than ISDN at this point in history.

Even though VoIP switching and transmission are different from that of traditional PBXs, many similarities remain. The audio is still digitized using standard codecs. Users still expect the same features that they always had, such as displays, hold buttons, speakerphones and voicemail. The phone still rings at dinnertime to tell you things that you don't want, and you still have to connect to the outside world so that you can call and be called.

Having said that, the differences that VoIP brings the broadcast arena are probably more important than the similarities. With VoIP, you, not the vendor or supplier, can choose the codecs to be used on an individual call or phone type. For broadcast use, higher fidelity codecs like G.722 are easily used, even at the desktop or conference room level. Of course you'll need those higher quality codecs at both ends of the call, but that's easily accomplished if not already the default.

The phone sets, or endpoints in IT terms (because they may not even be physical telephones) use open, published standards to communi-



### Telos VSet12

cate with the PBX and network. This means you can mix and match, buying phones that you like for a particular user or use. Naturally costs of these have declined and the number of choices has risen.

Connecting with the outside world (the Public Switched Telephone Network – PSTN) is now done in many ways. Historically, we've used Plain Old Telephone Service (POTS), an ISDN PRI (a T-1 line set up to use one of the channels as a call set up channel or data channel), or in some cases, even analog E&M trunks for PSTN connectivity.

POTS lines are still the most common and present the most performance challenges. A POTS line uses a two-wire loop that carries DC for off/on hook signaling, 90VAC ringing current, tones for caller ID transmission, call set up, and call progress, and of course speech audio. By its nature, it has loop loss and a fairly complex characteristic impedance, making separation of the transmit and receive audio much more complex and difficult.

### Beyond copper

In the current competitive environment, telephone companies are largely ignoring the copper outside the facility that carries POTS lines to your door in favor of selling more exotic and profitable cable-TV-like services. You've probably noticed more scratchy,



At the 2011 NAB Show, Comrex introduced the STAC VIP, its IP-based phone system.

# OMNIA.11 EVERYTHING YOU HEAR IS TRUE.

- Effortless dial dominance • Louder yes, yet always pure & uncompromised • Pop sparkles • Rock really rocks • Country caresses • Hip hop thunders • Voice is natural and intimate
- Push it hard and be amazed at how open and clean it remains

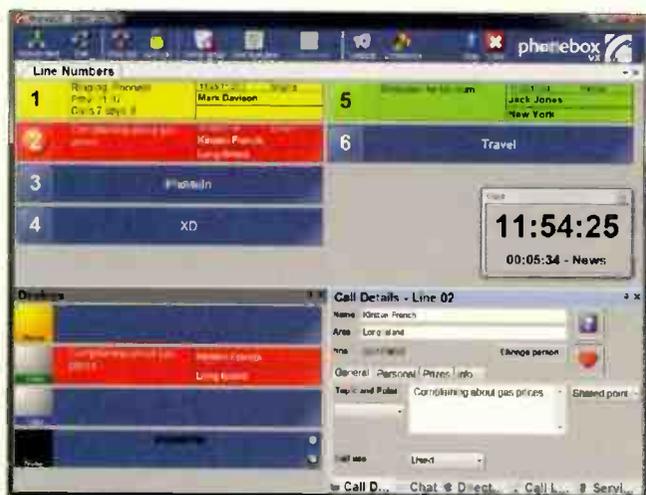
Find out more: [www.omniaaudio.com](http://www.omniaaudio.com)



©T.L.S. Corp. 2011. All rights reserved.

Radio never sleeps. Neither do we.  
We're here for you, anytime, with free round-the-clock, 24/7 technical support. Call +1-216-622-0247

World Radio History



### Broadcast Bionics PhoneBOX VX

hummy, lossy lines and, more importantly, noticed the now-lengthy repair commitment times, sometimes stretching weeks-long.

If we were designing a telephone service for broadcasters from scratch, we would likely specify that it have the following properties:

- A four-wire path; that is, separate transmit and audio paths
- Fast signaling on a separate path
- More control over transmission and routing
- Provisions for carriage of voice, video and any kind of data we could imagine
- It would be dirt cheap

VoIP delivers all of these features today; we just have to do things a little differently than in the past to make use of it.

It's completely possible to run VoIP within your own facility and across your own network while still using legacy methods for PSTN connection. You'd be making a mistake by not investigating and taking advantage of some of the new PSTN connection paths and their very aggressive pricing, but you don't have to make that move yet.

I suggest you connect using multiple methods until you're comfortable with a particular strategy. The value of multiple providers and redundant paths in emergency situations also shouldn't be ignored.

In the past, many decisions about phone systems were made because of the phone instruments themselves. People decided on a system because of the look, the feature set or the cost of the phone sets. But now that the system lock in is gone – the requirement to use products from a single vendor – you can choose the end point type based on your facilities' needs and wants without limitations.

End points are telephones, soft phones (computer apps) and appliances. They are what you talk into, and what you hang up. Our company, Telos Systems, has created end points that address the unique requirements of on-air use, including an entire multi-line on-air system (The Telos VX). Others will certainly follow.

The Telos VX emulates VoIP SIP phones, while adding important features that broadcasters need. These needs include phones with advanced screening features, high quality audio inputs and outputs with digital audio processing, a softphone with built-in recorder/editor, multiple program on hold inputs, and routing features that create the ability to move phone lines between studios effortlessly.

Once you've identified what end points you wish to use, a switching platform should be chosen. You need to decide how much control and responsibility you wish to take on or who you give it to. Delegating is good, but so is control. Traditionally, phone vendors performed installation and moves and changes. More than likely, you've taken on some IT duties over the past few years and are pretty familiar with the landscape. I'd say that the question to ask now is, "Do I want more control or less responsibility?"

If you opt for the "less responsibility" approach, hosted IP PBXs are available. You pay monthly, and tell the vendor what you want

## Phone Service Guideline

You can save a lot of money by choosing the right combination of services and providers. Here are a few basic guidelines:

- Don't put all your eggs in one basket. Use multiple providers where possible.
- Get rid of all but a few POTS lines. POTS lines are loaded with fees, taxes, and surcharges, and are less reliable than their digitally delivered brethren. Keep a few for emergencies, as the more type of services you have, the less likely any one provider's outage will impact you. Move them to digitally delivered DID-based services over a PRI, IP or a mix of types.
- Keep POTS for fax lines if you're still using fax. The VoIP standard for fax delivery is not widely implemented yet. (In my opinion, it won't be long until fax is gone anyway.)
- Keep ISDN lines if you use those. They're becoming hard to get.
- Port existing numbers or DID number blocks to your provider of choice. This will almost certainly be a competitive provider like a CLEC, cable provider or wireless Internet company.
- Choke lines may not be ported to another company, so evaluate whether you really require them or not. If you're not giving away cars daily, you probably don't need them anyway. (Editor's note: Some phone service providers may still require on-air and contest phones to be choke lines.)
- Don't over-buy services. I recently found a radio station with a maximum of 10 employees on site at any given time that had 48 DID trunks. That's enough for about 48 simultaneous inbound calls and probably 1,000 phone numbers. Insane and expensive.
- Avoid provider contracts more than two years in length, especially with incumbent carriers (Bell companies, etc). Things change, and they need an incentive to perform. Try to get language into the contract that lets you out of the deal if the ownership changes, or if they don't perform as promised.
- Avoid corporate "cram downs" or exclusive contracts. Many individual markets will have opportunities exclusive to their areas. Don't let the fact that your CIO plays golf with one provider's rep determine the fate of the entire company's communications. Seldom are these deals good for anybody but the vendor.
- Pay attention and share information with colleagues. Things are changing fast right now and many factors will affect your costs and capabilities.

ARRAKIS SYSTEMS INC.

## Pre-End of the World Sale... 25% off !!!

the Mayan calendar predicts the end of the world in 2012 so  
this sale lasts until December 31st, 2011



as seen here for only \$4,950  
a \$1,650 savings

- Fast delivery & often in Stock
- Hundreds of Configurations
- Fully Custom designs available

buy the 'BEST' for  
a 'Better' price

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.

Call us today at 970-461-0730 ext 309 for a free quotation

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

and how you want it. As in the past, you are constrained by the knowledge, capabilities and platform of the vendor. The blank stare reaction is a definite possibility here. I've always opted for taking care of my own phone infrastructure; if you're like me, you'll choose to take care of your own switch, which is now easier to do than ever before with free PC-based open source solutions like Asterisk and PBX in a Flash.

### Making connections

Once you have end points and a platform, you must determine how you'll connect to the PSTN. Hosted solutions do this for you as the platform and connectivity are bundled together inseparably. There are many methods for connecting to providers, including interface cards for PRI's that plug into your PBX, separate gateway devices that accept POTS, PRI and BRI, and Internet-based SIP providers that will sell you outbound calling services (often unlimited) and inbound DID (Direct Inward Dial) numbers. It allows you to rent a number or block of numbers in most any exchange area of the country or world, and have those numbers mapped to direct phone extensions.

We've used many of these services over the past few years and found them to be very reliable and inexpensive, with phone

## Resource Guide

### Broadcast Bionics

+44 1444 473999  
www.phonebox.com

### Comrex

800-237-1776  
www.comrex.com

### Telos Systems

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

numbers available for as little as \$1 per month. A Google search of VoIP DID providers yields many choices with wildly varying pricing structures and features. We've had very good luck with wholesale providers like Vitelity, Voicepulse, Sipstation and Flowroute, among others. Most will allow you to test with them at no cost to evaluate performance.

If you choose to use this type of provider, you'll need to be sure that you have a solid Internet provider and that you maintain quality of service (QoS) to ensure that any other traffic present on the wire (such as Web surfing or email) won't pre-empt the voice traffic that can't be delayed. Some providers will install a circuit to be set aside exclusively for voice traffic use.

Internet service can be the usual T-1, DSL or cable-based services. Fixed wireless and metropolitan area networks (MANs) are available in many cities, and can be a very good choice.

VoIP has changed the landscape in corporate communications in the last decade. It's easy to install, cost-effective and powerful. Is it right for your broadcast plant, right now? Only you can decide, but the question is no longer if VoIP will come to your studios, but when.

*Talbot is a product manager for Telos Systems, Cleveland.*

Web Images more

clear crisp bright sound

Search

Results 1 of 1



## OPTIMOD - FM 8600



OPTIMOD-FM 8600 "The quality of the analog signal is closer than ever to that of digital. Truly a new generation of audio processing."

Kevin Scott, Chief Engineer - KSWD Los Angeles

## The new clear starts here.

Processing that optimizes the sound of your FM channel while punching remarkably crisp, clean, CD-like audio through to your digital channel audience.

The most powerful and effective on-air FM processing system Orban has ever created.

35 YEARS  
1976 - 2011  
of Trusted Business and  
Customer Satisfaction

Mid South: Bob Mayben... 1-877-391-2650  
South Atlantic: Art White... 1-770-632-1295  
North East: Jim Peck... 1-315-623-7655  
Central: Bernie O'Brien... 1-731-695-1714  
North Central: Pam Leffer... 1-513-376-8600  
South West: John Lackness 1-210-775-2725  
Mid West: Mary Schnelle.. 1-513-899-3036  
West Coast: Doug Tharp... 1-866-673-9267  
Pro Audio: Ric Goldstein... 1-877-640-8205  
Latin America: Lily Massari 1-760-650-1427  
Bradley Div.: Art Reed.....  
Bob Eburg..... 1-800-732-7665

### CONTACT SCMS for ORBAN products

1-800-438-6040

www.scmsinc.com





Why do Axia consoles do phones best?  
(Hint: who's *your* daddy?)

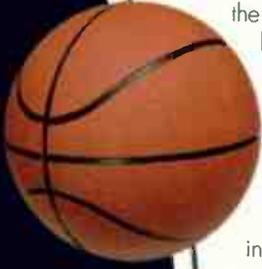


Other consoles treat phones like an afterthought. But Axia's parent company is Telos, so phones are part of our DNA. Consider our Element AoIP console, and the Telos VX broadcast VoIP phone system. Both amazing on their own. But when you connect them — magic. Total integration, so talent can run complex talkshows without taking their hands off the board. Effortless. A dedicated hybrid for each caller, each assigned to its own fader, with automatic mix-minus and talkback. Painless hookup via CAT-5 — no extra I/O or logic connections required. An all-digital path for crystal-clear caller audio, even from cell phones. That's the Telos connection. And only Axia gets it. Axia: the console that talks Telos.



## Helping Hawks Hit the Airwaves

to seat more than 18,000 for sporting events and 21,000 for concerts. The project required key components that would need to overcome the challenges of building inside one of the busiest multi-use facilities in the country. The Hawks play-by-play equipment would need an update, but a permanent play-by-play position could not be created due to the arena's multi-use functionality. Upgrades planned for the Thrashers play-by-play were not imperative, although with their position being a secure and permanent one in the arena, a rewire and clean up made its utilization as a central hub of communications back to the broadcast studios an obvious choice.



**John Kincade, the voice of the Atlanta Hawks, broadcasting live in the studio**

# iXm. The ultimate all-in-one.



Meet the best recording microphone ever. Enjoy an unbelievable sound. Experience a usability you've never seen before.



BGS call 352-622-7700



SCMS call 800-438-6040

 **YELLOWTEC**

## A new addition

Construction of a pre- and post-game studio inside the arena was vital. Several things to take into consideration during this part of the project were the multi-use aspects of the arena, though game day coverage would be integral with programming. Like the "Buck and Kincade show" in the afternoons, our other music format stations would benefit with live broadcasts from this studio during concerts and other relevant events at the arena. Dickey Broadcasting partnered with WellStar Health Systems to give WellStar the naming rights to the showcase studio. WellStar's brand is now constantly associated with Dickey Broadcasting's team-based broadcasts via digital signage that clearly displays their name and logo from inside the broadcast booth before, during and after every game.

Clearly, an abundance of audio connections between the multiple locations inside the arena would be required to facilitate the communications between the play-by-play positions, the pregame studio, and the broadcast studios off-site. Philips Arena has existing multi-pair audio lines from numerous locations that all terminate in the broadcast truck bay; this did not give us our required flexibility, enough paths, and would have created extremely long analog runs. These factors in conjunction with the risk of the occasional accidental cable pull, made it clear that running fiber would be the best solution to facilitate our needs for broadcast and distribution.

The most flexible solution was an IP-audio network over fiber-optic cable. Three pairs of single-mode fiber were installed between the Thrashers play-by-play booth, the Hawks play-by-



Portable rack for Atlanta Hawks' games

play position, and the new pre/postgame studio. A pair of HP ProCurve 2510G switches equipped with fiber GBICs were added to facilitate the IP connectivity.

Upon completion of a robust IP network at the arena, the next decision was how to transport the audio. A significant amount of Wheatstone IP blades for audio-over-IP networking had just been utilized during a recently completed studio build at Dickey Broadcasting's WCNN AM 680 The Fan. The engineering team was well versed in the setup, operation and maintenance of these units, thus we continued with this equipment. Three

# Monitor Confidently.



## Inovonics 632 HD Radio™ Monitor

*The first scalable solution for confidence in FM & HD Radio™ multicasting.*



EVALUATION UNITS AVAILABLE  
[www.inovonicsbroadcast.com](http://www.inovonicsbroadcast.com)  
1-800-733-0552

© 2011, Inovonics Inc. Immediate delivery and availability upon product certification by IBIquity Digital Corporation.

ARRAKIS SYSTEMS INC.

# THE NEXT GENERATION ANALOG CONSOLE

- analog & digital with USB sound card modules
- Cat5 cabling for today's infrastructure
- Control room & Studio monitors
- 15 channels, 30 inputs
- much more

## MARC-15-15 MODULAR ANALOG CONSOLE

the MARC is a next generation analog console that mixes analog and digital technologies with USB PC sound card modules (on air software included). For today's cable infrastructure the MARC uses CAT5 cabling and RJ45 connectors (cables included). Three stereo buses plus dual conferencing phone hybrid mix minus buses handles the big jobs.

very low  
profile tabletop  
design & fast access  
to level adjustments and cabling

**\$6,499**

conductive plastic  
faders and LED lighted  
switches for reliability.  
Socketed ICs for fast  
on site repair,

CAT 5 cables for all input/output

MARC-15-12 ... \$5,499

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

ARRAKIS SYSTEMS INC.

# Digilink-Xtreme Automation

integrates with Arrakis  
ARC consoles

the **BEST** automation  
in Radio... period !

Unattended Games mode  
Streaming services support  
RDS support

Windows 7  
compatible

- Live On Air w Hot Keys array
- Hard disk Automation
- Satellite Automation
- 16 input stereo switcher
- Phoner recorder & editor
- Voice track your shows
- Music scheduling standard

Join the hundreds of others on air with Digilink-Xtreme, the best automation system in Radio. Full featured, it is easy to install, use, and maintain. Best of all, it is easy to buy. Choose from either the no contract \$100 per month 'Solutions Program' or buy 'Xtreme-Complete' outright for only \$6,500.

With the \$100 per month 'Solutions Program,' you receive Xtreme software (On Air, Production, & Scheduling) and "Bridge" hardware PLUS training, support, and upgrades for your ENTIRE radio station. You supply the PCs or we can supply them for you. For less than the cost of a good cell phone contract you can be on air tomorrow with Xtreme, the best automation system in Radio.

With 'Xtreme-Complete' for \$6,500, you purchase a complete system ready for air: DELL business PC, Arrakis 'Bridge', and Xtreme software for on air, production, scheduling, voice tracking and more. The system comes with a full year of the 'Solutions Program' with training, support, upgrades, and next business day 'Bridge' replacement if it should fail. The DELL PC comes with 3 years of next business day, on site service from DELL.

Order your system today and receive it tomorrow, call us at 970-461-0730 ext 309

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



**Stuck without a true EAS and CAP solution?  
Get in the fast lane with Digital Alert Systems.**

Only Digital Alert Systems gives you...

- Full EAS/CAP compliance at the lowest cost-per-stream available
- Complete, integrated and fully compliant EAS/CAP units starting at just \$1,995
- Available internal AM/FM/WX receivers
- Customized solutions fit current and future station layouts
- More serial, USB, and Ethernet (IP) ports for interfacing options
- Full web-browser operation with multiple simultaneous access and tiered security.
- Avoid collisions with sophisticated automation Interfaces to prevent commercial step-ons

**Digital Alert Systems** [www.digitalalertsystems.com](http://www.digitalalertsystems.com)  
585-765-1155



**Acoustics First**<sup>®</sup>  
Materials to Control Sound  
and Eliminate Noise<sup>™</sup>



**Absorbers, Diffusers, Barriers and Vibration Control Materials**

Toll Free **1-888-765-2900**

Web: <http://www.acousticsfirst.com>

**Engineering team**

- Gary Kline, VP engineering and IT, Cumulus Media
- Michael Gay, project manager, Cumulus Media
- Marc Lehmutz, market DOE, Cumulus and Dickey Broadcasting/Atlanta
- Timothy Stephens, chief engineer, Cumulus and Dickey Broadcasting/Atlanta

**Equipment list**

- AirTools Voice Processor 2x
- Aphex Compellor 320D
- APT WorldNet Oslo
- Canare Starquad
- Crown CTs 4200 quad amplifier
- Denon DNC640
- Electro-Voice RE27
- Gepco 61801EZGF
- HP Z400 Quad Core PC
- JBL Control 1 PRO, Control 28
- Lectrosonics HM plug, IFBT4, R1a, SMQV, VRMWB
- Mackie 1642-VLZ3, 1402-VLZPRO
- Matrox M9140
- Neutrik Gold XLR and 1/4" connectors
- Omnirax cabinetry
- Philips BDL4251 Digital Signage Displays
- Philips PFL3505D
- Premier Tilt Mount P2642T
- Presonus HP60
- Pro Co Sound Short Stop (modified by Cumulus)
- Sennheiser HMD 25, ME 66
- SKB Studio Flyer 1SKB19-RSF4U
- Sony MDR7505
- Tascam TU690
- Telos Zephyr XStream
- TransLanTech Sound A.iane Sequel
- Wheatstone IP88a



The producer's desk features a Mackie mixer on Omnirax furniture



The equipment rack sits behind the producer's desk

Wheatstone IP88a blades were used to create connections between the various broadcast locations within Philips Arena. A WorldCast Oslo system was used to terminate both ends of the T1 point-to-point that was installed between the broadcast facility at WCNN and the rack in the Thrashers play-by-play booth, thus finalizing the configuration of three pairs of bidirectional channels for connectivity.

### Permanent portability

Now that the connectivity and wiring issues were addressed, the next challenge was properly equipping the Hawks play-by-play position. The advantage of Philips Arena being a multi-use facility should not be a disadvantage to the operation; therefore, a portable solution for this position was required despite the fact that it would be in the same location each time. The high expectation of technical standards would remain, starting with the fiber that was run

to the location in the arena. The Hawks portable rig consisted of a Wheatstone IP88a blade, AirTools 2X Dual Voice Processor, and a Presonus HP60 headphone amplifier all packaged neatly in a SKB Studio Flyer rolling rack. The talent was fitted with Sennheiser HMD26 headsets and a Lectrosynics HM transmitter fitted to an Electro-Voice RE50B, used for walk-off interviews of players and coaches, all being mixed using a Mackie 140VL3PRO at the Hawks play-by-play location.

Due to the space constraints and the non-permanence of this position, wireless microphone receivers were placed in the Thrashers' permanent play-by-play booth. The elevation of the booth in

# SOLID PERFORMANCE RELIABILITY SUPPORT

Program Automation  
& Control is at the  
heart of today's  
broadcast facilities.

ENCO delivers Performance demanded by today's talent, engineering and management.

ENCO designs software for high Reliability required for mission critical 24/7 operations.

ENCO delivers the Best Support in the Industry with a 20+ year history under our original founding ownership.

When you upgrade to DAD or Presenter, you're assured of World Class Digital Audio Delivery System Performance, Reliability and Support. If you upgrade now, we'll convert your library at no charge using our Intelligent Conversion Engine. Call us and learn how our experience can pay off for you.

**ENCO - Providing the tools & technology to positively impact your Bottom Line.**



[www.enco.com](http://www.enco.com)  
[sales@enco.com](mailto:sales@enco.com)  
+1-248-827-4440  
800-ENCO SYS

## Helping Hawks Hit the Airwaves

the arena made this an ideal location for the antennas. Sennheiser ME66 shotgun microphones were also placed in the Thrashers' booth for F/X miking. The audio from the wireless receiver and the shotgun mics is then delivered to the mixer using the fiber network. The final mix goes back over the network to be processed by a carefully tuned Arianne Sequel before it is sent to the Oslo system for transport to the broadcast studio. Early on, there was concern about the performance of the Wheatstone blade with the repetitive connection/disconnection activity due to the uniqueness of the portable position of the Hawks within the arena. Pleasingly, this has not been an issue, with the blades syncing up and transporting audio in less than two seconds.

The approach to the pre- and post-game studio construction at Philips Arena was to draw on what had been learned from the construction of similar projects in the past, including the build at Turner Field for the Atlanta Braves. Keeping similar elements in both projects would be the key to efficiency with engineering and design. Early in the design phase, management at Phillips Arena offered the use of the extra hockey glass that was hanging around the facility, showing off a stack of 4' x 8' sheets of tempered glass stamped with the NHL certification and the Crystaplex manufacturer's logo. The glass had been previously used in the arena, with some of hockey's greats being slammed against it. A few minor dings and scratches would simply add character, but for the most part, the glass was crystal clear. With the use of this glass, a studio could be created enabling a view of the talent from any angle, enhanced by a 20' span of



**The modified cough box and mic setup features adjustable volume and custom labeling.**

glass on the front façade. The general contractor, O'Brien & Associates in Buford, GA, operating as a division of WeatherTite Windows was excited to be a part of the project. The structural steel beams and framework of the roof were designed to mimic the curved roofline of Philips.

### Inside to outside

Once the booth was built, the concentration turned to the interior from a technical and an aesthetic standpoint. As luck would have it, a local company called Fanmats was discovered that made carpet tiles with the logos for the Hawks and the Thrashers, as well as other sports franchises, using a special chromojet process that embeds the color into the fiber. The studio furniture, including a SportsCenter-style desk, as well as the producer position and rack, was designed and fabricated by Omnirax. Four 42" Philips BDL425 1V LCD monitors were set up for an array behind the talent inside the booth. In addition to this, a 1' x 8' array of these monitors was set up, crossing the

## World's Best 24kbps Stereo

ECLIPSE LBR4



### Louder without Compromise

The DaySequerra Eclipse LBR4 Low Bit-rate Loudness Processor is a four-stream AES stereo audio processor specifically designed for codecs used in HD Radio™, DAB+ and DRM+ digital radio systems.

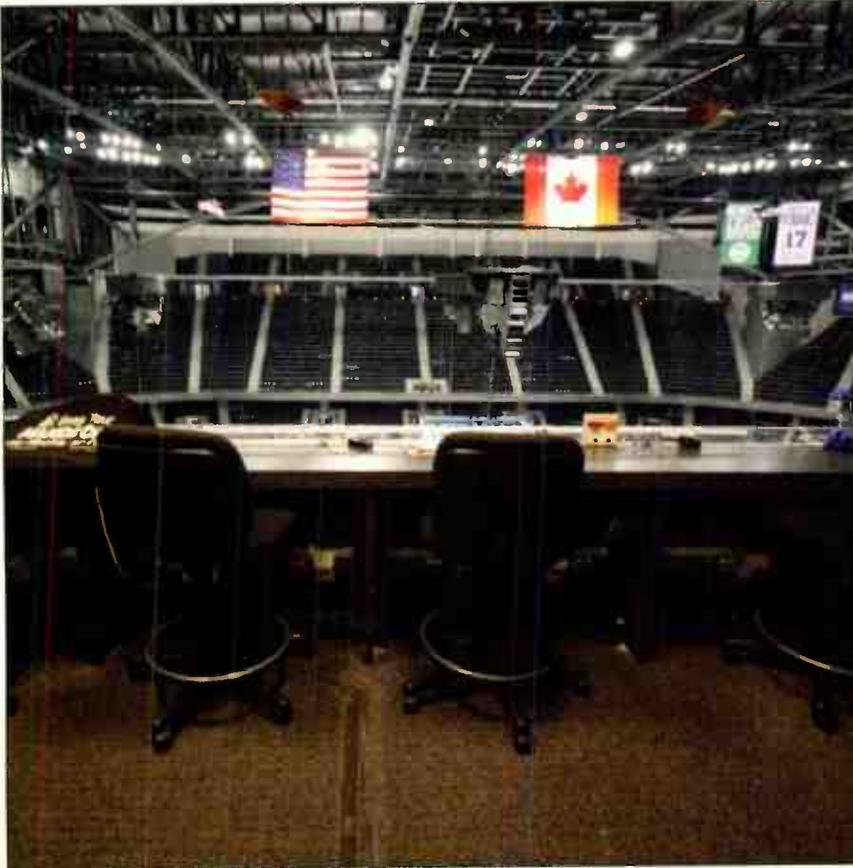
- Industry-proven DTS® Neural Loudness Measurement
- Optimized for 24 kbps, 32 kbps and 48 kbps bit-rates
- Eclipse™ codec pre-processor reduces lossy compression artifacts
- Ethernet interface for email alerts and software updates



DaySequerra

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

©2011 DTS, Inc. All rights reserved. DTS, the Symbol and DTS and the Symbol logo are registered trademarks and DTS Neural Surround is a trademark of DTS, Inc. ©2011 DaySequerra Corp. All Right Reserved



**The broadcasting setup for the Atlanta Thrashers hockey team**

entire 25' span above the escalators heading upstairs to the area where the studio resides. These provide an effective way to draw attention to the broadcast as well as a way to promote sponsors.

There is no doubt that the studio is fully functional and ready to go when the talent sits down behind the ever ubiquitous Electro-Voice RE-27 microphones on 309A mounts combined with Sony MDR-7505 head-

phones. The gathering crowd outside is treated to a live broadcast via a pair of JBL Control 28 speakers. All the mixing is performed on a Mackie 1642-VLZ3 at the producer position. Multiple audio buses allow a customized mix for the crowd and for bidirectional producer talkback to the talent in the facility as well as the broadcast studio back at WCNN.

Pro Co Sound Short Stops were modified to create a cough box complete with headphone volume control and custom labeling. The inputs to the Wheatstone blade are protected by an Aphex Compellor 320D while the final feed is delivered to the broadcast facility at The Fan via the Oslo system.

It was an exciting yet challenging opportunity to build an audio-over-IP network inside one of the busiest concert and sporting venues in the country. The benefit of having full-time connectivity to the broadcast facility is great with the guys able to come in and start working without calling the station to coordinate dialing in on an ISDN line. The design and build teams of Dickey Broadcasting and Cumulus

Media had a lot of fun on this project and the engineering team takes pride in being a part of a project that can be seen and heard by a plethora of people who pass through the arena each year.

*Gay is a project manager for Cumulus.*

*Thanks to Liz Haddon for assistance in preparing this article.*



From the microphone to the antenna, **Broadcast Connection** is your source for the latest in broadcast technology.

We offer a full line of the best products available.

**Contact our experienced team of specialists for all your radio needs.**



<p><b>Max Brown</b> Mukilteo, WA 719-650-6330 max@broadcastconnection.com</p>	<p><b>Terry Becht</b> Canyon Lake, TX 830-899-7012 terry@broadcastconnection.com</p>	<p><b>John George</b> Lexington, SC 803-951-7443 john.george@broadcastconnection.com</p>	<p><b>Ken Perkins</b> Evergreen, CO 303-674-6566 ken.perkins@broadcastconnection.com</p>	<p><b>John Shideler</b> Mesa, AZ 970-227-1405 john@broadcastconnection.com</p>	<p><b>Eric Wandel</b> Newburgh, IN 812-490-7947 eric@broadcastconnection.com</p>
---	--	--	--	--	--

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

## Using the ULS database

By Doug Irwin, CPBE AMD

Likely you're aware of the FCC's Universal Licensing System (ULS) database ([wireless.fcc.gov/uls/index.htm](http://wireless.fcc.gov/uls/index.htm)). The ULS is one of those websites that has way more information than you'll ever need. The trick to making use of it is to narrow your search parameters to get a limited number of responses. Here's a real-world example of making use of ULS.

Say for example you want to install a newly licensed 950MHz band system at a mountain-top transmitter site. As part of the licensing process, frequency coordination was done, and (luckily for you) your new system requirements worked out with

all parties concerned (co-channel and first- and second-adjacent channel users as well). But at a mountain top site it is often very important to know what else may be going on in the RF neighborhood because, even though some users may be many megahertz away from your channel, they could still affect what you are doing.

Using this same example, let's determine if paging transmitters are located on-site, and if so, what frequencies they use. (Paging transmitters can be the bane of existence for digital STL systems.) Here's how we go about this.

- Determine site coordinates. There are many ways to do so, but in this example, I'm picking a tower ASR number at a site in western Washington State. From that I gather the NAD 83 coordinates.
- Browse the ULS database.
- Click "advanced license search" on the left side of the page.
- Under the heading "Call sign and radio services" select "match only the following radio services," and then type "CD" – paging and radiotelephone services.
- Under the heading "frequencies" I use the range 920 to 960MHz
- In the lower right corner, click "geosearch."
- Scroll to "coordinates" and enter your NAD 83 coordinates. I usually pick a 1km radius around the tower site as well, as shown below in Figure 1.

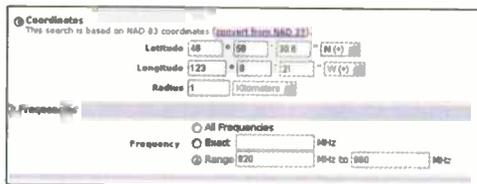


Figure 1.

Now finally, click on "search" and relax for a few minutes – it takes a little time to get the results. My search parameters were narrow and as it turns

out, there isn't that much at this site, as the results show in Figure 2.

So there are at least two possible paging trans-

Call Sign/Line ID	Name	Freq	Radio Service	Status	Expiration Date
1. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Licensed	04/01/2009
2. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
3. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
4. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
5. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
6. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
7. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
8. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
9. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
10. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
11. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
12. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
13. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
14. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
15. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
16. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
17. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
18. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
19. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009
20. KNKL960	Arb Wireless License Co., LLC	900.0251943	CD	Active	04/01/2009

Figure 2. The search results.

mitters at the site in question. (The others were all listed as expired.) Click on the call signs and you can read their particulars. Both KNKL960 and KNKM580 are listed as active, and are licensed at the site on frequencies of 931.0625 and 931.1375 respectively. In both cases, the ERP is just over 300W.

### What next?

Now that you have this information, what do you do with it? Well as I mentioned earlier, if you were installing a digital STL receiver at this site, it would be wise to install a filter ahead of it to prevent desense, which is quite likely when these 300W ERP paging transmitters key on and off. When the receiver is installed, take a spectrum analyzer along and look at the receive antenna for these particular paging transmitters. Make notes about whatever else you see between 920 and 960MHz.

There is one more thing you can do with this information. If, when you installed the transmit side of this new link, you had the antenna direction tweaked and found it to be right on your licensed parameter (as it should be), then take that spectrum analyzer, connect it to your transmit antenna, and look for these paging transmitters. Make a note of their strength. This information can be very valuable if, for some reason, you have to repair and later re-install the transmit antenna because you can use these paging transmitters as beacons for finding the site in question and at least roughing-in the bearing of the antenna in question. Also, you can conclusively determine the overall health of your transmit antenna/coax system by comparing the beacon strengths from the day of installation to those taken immediately after the repair.

*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).*

**We need your tips!**  
Ideas submitted to Tech Tips may be suitable to earn SBE recertification credits.

Do you have a tech tip?  
Send it to us at [radio@RadioMagOnline.com](mailto:radio@RadioMagOnline.com)

**NEW**

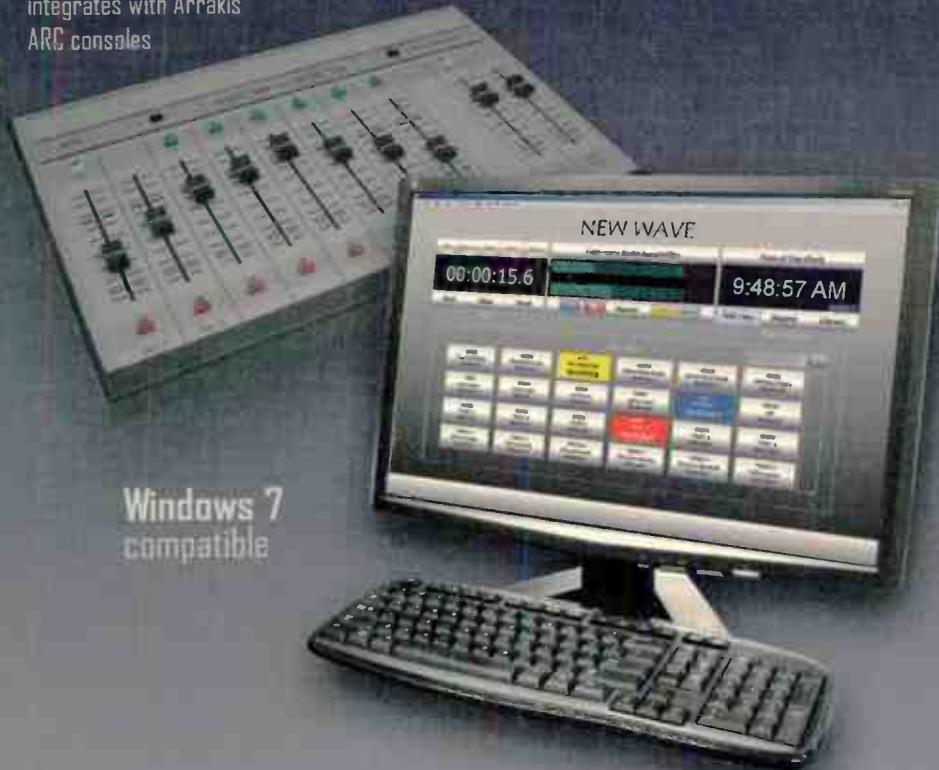
**ARRAKIS SYSTEMS INC.**

**NEW**

# NEW~WAVE Automation

integrates with Arrakis  
ARC consoles

the **BEST** automation  
in Radio... period !



Windows 7  
compatible

Introductory Sale

**\$ 750**

\$1,000 mfrp

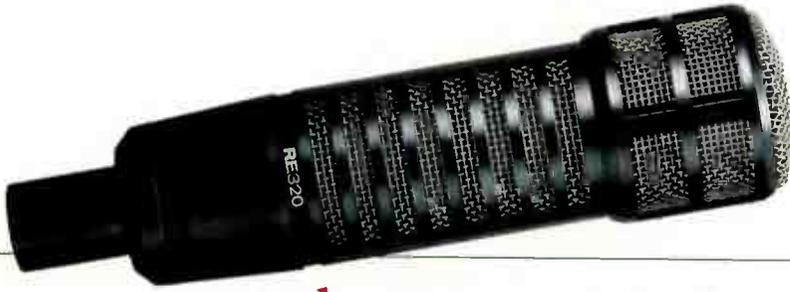
Perfect for Broadcast & Internet  
3 play... On-Air Live, Automate, & Cue  
Simultaneous Recording for Production  
Voice track recording for perfect Automation

Powerful Music scheduling  
Supports Traffic & Music imports  
RDS and Streaming service interface  
Easy to learn and use & Autofills empty hours

NEW~WAVE is a Windows PC based software solution for today's and tomorrow's professional radio applications. It is designed specifically for playing audio files from hard disk, internet streams, FTP stored audio files, MP3 players, smart phones, text to speech, and much more. NEW~WAVE brings together all of the newest technologies to produce an exciting show for your radio audience. Play live broadcasts, automated broadcasts, podcasts, and stream for internet radio... all at the same time. Most important, NEW~WAVE is quick to learn and easy to use. Designed for both novice and professional alike, it has the simplicity required to get to air quickly and yet the sophisticated features for advanced users. Highly fault tolerant, NEW~WAVE will not allow dead air in automation. Also, if connected to an Arrakis 'Advanced Radio Console' (ARC series), the console and software merge to complete a powerfully integrated radio workstation. NEW~WAVE supports the Windows 7 operating system.

Order your system today, call us at 970-461-0730 ext 309

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



## Electro-Voice RE320

By Dan Israel

**I**t's not enough to have good parents these days. Being made by a name brand manufacturer only gets a new audio device in the studio door. Getting to stay is incumbent on performance.

There is little question as to the audio heritage of the RE20 and RE27N/D. Both have proven themselves as venerable workhorses in the broadcast and recording industries. From the studio mics in 50kW flame-throwers to kick drums, these remain staples of our industry. And with the release of the RE320, Electro-Voice adds to the lineage of this great line. But to take its rightful place inside the shock mount throne, the RE320 will have to speak for itself.

### Out of the box

Technically, the box is a pressed-fit zippered ballistic nylon. Not a bag. But not a conventional box either. It is well constructed and more than ample protection for transporting this large mic.

Unzipping the box, the 320's metallic black finish looks great. The shell design seems to have changed very little from the RE20 and RE27.

Another benefit of the unified profile is its interchangeability with the 309A, perhaps the largest shock mount ever manufactured. It can be a little tough to see around, but the RE320 is no pencil microphone.

## Performance at a glance

- Variable-D minimizes proximity effect
- Integral pop filters
- Dual frequency response settings
- 30Hz-18kHz frequency response
- Cardioid pattern

### In use

My first session with the RE320 was a voice-over in the recording studio. I performed a side-by-side test between the RE20 and RE320. The 320 is definitely brighter and around 5.7dB hotter than the RE20 using my Focusrite ISA428. Being a dynamic mic, it is below the output of a modern condenser, especially when connected to a transformed microphone preamp like the Focusrite. Although more gain may be necessary, signal-to-noise is not a problem due to EV's hum-bucking coil design. Even after engaging the second gain stage in the ISA428, this mic was quiet. In fact, it may even have less noise than the high-output condensers.

The bump in high end feels more consistent with the bright condensers that have flooded the market over the past few years. Yet this change is not enough to offend most RE20 users and still feels very natural.

Let me throw in here, the low cut filter switch is *not* a low-cut filter switch! Somewhere along my career I stopped reading manuals (please don't tell my children). As it turns out, E-V has put this switch to a more novel concept. The 320 has two tonal curves. One is used for general purpose, like voice. The Voice Contour is a fairly flat response to around 100Hz with a bump at the upper mid- to high frequencies. The Kick Drum Contour is tailored to extend the low end a bit. And it has a gentle notch around 200-400Hz. Perfect for boxy instruments or even voice in small booths.

### Undisputed feature

Without a doubt, if you are not familiar with this line of mics, you'll be amazed at the lack of proximity effect. And the RE320 continues that detail. An announcer could look hard left and right without any discernable drop in low end. You can back away without sounding like you're off-mic. Remember when we used to reach for a cart in the rack behind us? Not that it happens anymore, but there is still plenty of movement in live broadcasting. Watch ESPN's simulcast of Mike & Mike in the Morning for an example of just how much movement this mic can negate.

There simply isn't another microphone design with this tonal consistency.

Because of this feature, I thought it would be interesting to test the mic against instruments that exhibit their own proximity effect (similar to kick drum). I started with a Yamaha Conservatory Grand Piano. By conventional thinking, this is a bit of a stretch for this mic. But in a scenario where you were forced to track with the lid closed and the mic very close to the sounding board, the RE320 has an ability the conventionals don't. The RE320 stayed far more focused on sonic energy under 1kHz.

I also found the 320 to be very nice on snare drum and toms. The consistency of bottom end from the 320 makes for a very easy mixdown. While the solo track felt like it lacked sizzle, the track cut through the mix quite well.

For applications that either exhibit their own proximity effect, or where the source distance is constantly changing, this mic is worthy of consideration. Not that I recommend tight miking a string section, but sometimes circumstances force on us less than ideal positions. This mic might prevent some of the booming that Cellos tend to exhibit up close. Or perhaps it could provide a little sonic discipline to that guitar cabinet that just won't behave.

And of course, one of the most complex instruments to record: The human voice! The 320 handles plives very well, even without a 1/2" of foam windscreen. This ability, in combination with minimizing the proximity effect, is exactly what an on-air studio demands – making the RE320 an ideal mic for live voice.

## Conclusion

Electro-Voice has continued the heritage of the RE20/RE27 with the RE320. It is a microphone that can perform, in some ways, like no other. For

general purpose fidelity and sensitivity, high-output, large capsule condenser microphones are hard to beat. But to properly use and protect them, you need a great degree of control over the myriad of variables within the studio. When that control is not possible, or when it comes to needing a durable mic that can withstand the harsh environment of close miking from a variety of sources, the RE320 is an excellent choice.

Its low-end is stunningly consistent. For the many applications where proximity to the microphone can change, this microphone can save the day!

*Israel is executive producer, Kansas City Chiefs Radio Network.*

Editor's note: Field Reports are an exclusive Radio magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company. These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested. It is the responsibility of Radio magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by Radio magazine.

## Electro-Voice

**P** 800-392-3497

**W** [www.electrovoice.com](http://www.electrovoice.com)

**E** [pro.sound@telex.com](mailto:pro.sound@telex.com)



Listen to Dan's test of the RE320 at [RadioMagOnline.com](http://RadioMagOnline.com)

# Proven

# Consistent

# Reliable



YES —

BUT THEY'RE MUCH MORE:

- \* INNOVATIVE
- \* DEDICATED
- \* RESPONSIVE

CONTACT MYAT WITH YOUR PASSIVE RF REQUIREMENTS.



FM Splitter/  
Patch Panel



Coaxial Transfer  
Switch



LPFM/IBOC  
Filter 3kW



LPFM/IBOC  
Filter 8kW



FM Constant  
Impedance Combiner



FM Switchless  
Combiner

For over 59 years broadcasters have relied on proven MYAT RF solutions. From rigid transmission line systems to filters to switches and combiners, we deliver performance on time, every time. Whether it is basic hardware or full-line integrated engineering solutions, MYAT designs and builds reliability into every product we make. And with our unmatched stock and inventory, we can assist with your immediate requirements and last minute needs.

Learn why so many  
broadcasters rely  
on MYAT.

**1-201-684-0100**

**[www.myat.com](http://www.myat.com)**



## Yamaha Stagepas 300

By Gil Wilson

**R**adio station remote broadcasts seem like simple ideas, but at times they can be as difficult to figure out as quantum physics. The lonely remote broadcast engineer is always the first to arrive and the last to leave. In many cases the engineer isn't a full time engineer, but maybe an intern roped into setting up the broadcast, or even the promotions person who also takes care of everything else in the remote broadcast. Sometimes the difficulty level of a remote is unknown until the time of the broadcast. If you have the dedicated remote engineer advantage then you can solve all problems as they arise by some MacGyver-like workarounds.

Along with the remote connection to the studio, a sound system has to be set up. I've seen everything from a boom box to a huge PA with 3' tall speakers being used in a remote. When it comes to a PA pumping to the locale, you don't want

side and the sound filled the outdoors with nice distribution in an area equal to a little league baseball field. The entire unit (including the mixer) fits in the space of two speakers that measure 10.8" W x 18" H x 10" D. This all-in-one system includes a pair of passive speakers, a detachable powered mixer, and a pair of speaker cables. The eight-channel powered mixer can be used either while installed in the speaker compartment or detached for easy positioning and access. So basically all that has to be carried for PA purposes are the two speakers. One speaker is storage for the mixer (removed with a simple locking screw) and the other has space for the power and speaker cables with room left for a microphone and cable.

Let's look at the mixer setup. There are eight input channels with channels 5/6 and 7/8 blended together for stereo inputs. Channels 1-4 are mono inputs accepting either XLR or 1/4" phone jacks. These channels have an equalizer section to adjust high and low frequencies with a range of  $\pm 15$ dB (high and low each have their own pot). They also have a button to determine mic or line level input. These four channels also have the option for adding reverb.

The next four channels are ganged in pairs to provide stereo line inputs and leave off the reverb effect button. Channels 5/6 have the choice of RCA or 1/4" inputs. Channels 7/8 have RCA input only, which is ideal for an MP3 player, portable radio or other audio source.

### Performance at a glance

150W per  
speaker output

20Hz-20kHz  
frequency response

70W power  
consumption

Speakers measure  
10.8" x 18.0" x 10.0"

Mixer measures  
11.4" x 3.8" x 6.3"

Total weight 39.7lbs

overkill, but you don't want to under do it. Here's where the Yamaha Stagepas 300 PA system fits. This dynamic system is a great middle-of-the-road starter point. This system pumps out 150W per channel with crisp highs punchy mids and big, fat bass. The Stagepas 300 delivers a clear, powerful sound. Its rugged, durable construction and easy setup make for the perfect remote broadcast PA for any situation.

#### The right size

The Stagepas 300 can fill a noisy bar, a 300-person lecture hall, or the small conference room-type setting with ease. I even tested it out-

# FIELD REPORT

There are three choices for outputs: Speaker L/R for the included speakers (1/4" phone jack con-

nection from mixer and into speakers), record out L/R (RCA jacks) and monitor out (dual 1/4" phone jacks). Out of curiosity I connected the monitor out jacks to larger PA system and it worked perfectly: no hum, no loss.

On the record out, I would have liked to see a separate level control for added flexibility, but it is (like all the outputs) controlled by the master out level knob.

All in all, I found this to be an ideal remote broadcast PA for medium-sized use. Anyone can operate it with very little training, it is powerful, portable and painless.

*Wilson is an announcer, producer, webmaster and promotions guy at WAKO-AM/FM, Lawrenceville, IL.*

Editor's note: Field Reports are an exclusive Radio magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company.

These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

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

## Yamaha

**P** 714-522-9000

**W** [www.yamaha.com/livesound](http://www.yamaha.com/livesound)

**E** [infostation@yamaha.com](mailto:infostation@yamaha.com)



**The digital audio product suite developed and perfected in an audiophile listening lab.**

D to A Converter

A to D Converter

4x1 Digital Audio Switcher

Universal Digital Audio Converter

1x4 Digital Audio DA



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



**RDL**  
Radio Design Labs

# NEW PRODUCTS

www.RadioMagOnline.com

by Erin Shipps, senior associate editor



## Handheld video recorder Samson Technologies

**Zoom Q3HD:** Recording both HD video and HD audio (24-bit/96kHz), the Q3HD takes Zoom's audio technology and combines it with 1080p video. This point-and-shoot features both full HD 1080p at 30fps and 720p at 30 or 60fps. A 4x digital zoom and a larger, redesigned aperture is paired with three lighting settings. The Q3HD uses the same microphone capsules as Zoom's H4n recorder, configured in a wide 120-degree X/Y pattern, for stereo recordings of unsurpassed quality and depth. Setting audio levels is easy using the onboard level meters and mic gain switch with auto gain control.

631-784-2200; [www.samsontech.com](http://www.samsontech.com); [info@samsontech.com](mailto:info@samsontech.com)



## Distribution over Ethernet Gefen

**GTV-MFDA:** The GefenTV 1:8 multi-format distribution over Ethernet allows VGA, component, composite and S-Video plus audio, to be distributed to many receivers. This versatile product is useful for digital signage applications, or educational institutions. The video/audio works in broadcast mode from the sender to all eight ports simultaneously. The receiver's two-port switch/hub can be daisy-chained. Additional features of this product allow the facility of audio-video distribution over a local area network's infrastructure. Connect the A/V source into the sender inputs. Connect up to eight receivers if the connection is directly between send and receive units. Another connection concept may be to connect one CAT-5 on the sender side to the network infrastructure. In that configuration the receivers will be connected to the network as well. So, if a PC is connected to the network, then a second RJ45 needs to be connected into the receiver as well. The video output from the receiver should be connected to a display. Power up and the signal is passed directly to all outputs connected.

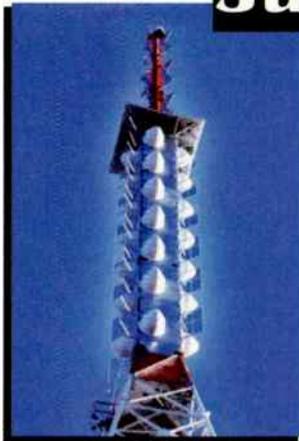
800-545-6900; [www.gefen.com](http://www.gefen.com)  
[gsinfo@gefen.com](mailto:gsinfo@gefen.com)

## Audio power amplifier RDL (Radio Design Labs)

**FP-PA18, FP-PA18H:** This high-efficiency, 18W power amplifier features a balanced line-level input, 8ohm output, integral audio compressor and automatic sleep mode. The sleep mode conserves power when the audio input falls silent. Connections are made via a detachable terminal block connector. A digital timer switches the class D output stage off so the unit consumes less than 1W of power. The sleep mode timer can be set to 5, 15 or 25 minutes or off (amp always on). Upon detection of an input signal, the amplifier is restored to full operation within 150 milliseconds. The amplifier's frequency response is 20Hz to 20kHz. Also available as the FP-18H, which is a high ambient temperature version that will operate in ambient temperatures up to 70 degrees Celsius.

800-281-2683; [www.rdlnet.com](http://www.rdlnet.com); [sales@rdlnet.com](mailto:sales@rdlnet.com)

# When You Want More Than Just An Antenna



**Full line of HD Radio Accessories:  
Circulators, Mask Filters,  
Reject Tuners, and  
Rigid Components.**



**MASTER FM DUAL  
INPUT HD ANTENNA**



**JSHD DUAL INPUT HD  
SIDEMOUNT ANTENNA**



**RCA 10dB HIGH  
LEVEL HD INJECTOR**

JAMPRO ANTENNAS/RF SYSTEMS, INC. • P.O. Box 292860 • Sacramento, CA 92829 USA • Phone (916) 383-1177 • Fax (916) 383-1182 • Toll Free (866) 452-6770 • [www.jampro.com](http://www.jampro.com)



Your Partner for HD Radio Solutions



"A fast paced station needs a system that can keep up and is easy to use. Op-X gives us the tools we need to deliver the sound Houstonians have come to expect from KRBE."

-Leslie Whittle, Program Director  
KRBE, Houston, TX



- Modular Operation in Op-X allows for a tiered system at a fraction of the cost of it's competitors.
- Each studio client is capable of accessing all Audio Server modules on the network.
- Remote voice-tracking allows for creation of content for remote studios also running Op-X.
- The revolutionary design of Op-X's clock builder turns the previous task of scheduling satellite programming into a few simple clicks.
- Share serial devices from any machine using the Op-X Serial Server.
- Importing logs now gets its own module that takes confusion out of the process.
- Engineers will enjoy Op-X because it's easy to install, maintain, and has automatic backup features.

# AUTOMATION

SIMPLE • POWERFUL • REDUNDANT

*Not since Axia audio-over-IP was introduced to the broadcast industry have we at BGS been so excited! It is with great enthusiasm we'd like to invite you to take a look at the new Op-X Radio Automation delivery system for any single or multi-station cluster. Op-X's versatility allows it to operate seamlessly with either Axia IP-Audio networks or legacy audio consoles.*

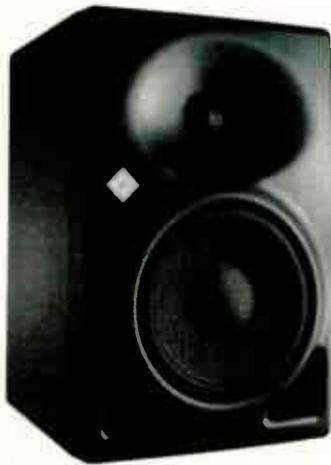


**Broadcasters  
General Store**  
352-622-7700  
www.bgs.cc

## NEW PRODUCTS

### Studio monitor Neumann

**KH 120:** The first product in the new line of Neumann studio monitors the KH 120 is designed for use as a near-field loudspeaker or as a rear loudspeaker in larger multi-channel systems. The KH 120 A features acoustic and electronic simulation and measurement technologies to ensure accurate sound reproduction. It has a Mathematically Modeled Dispersion waveguide (MMD), flexible acoustical controls, analog class-AB amplifiers, a large headroom analog input and an extensive mounting hardware range. It features a -3dB free field frequency response (52Hz-21kHz  $\pm$ 3dB) and pass band free field frequency response (54Hz-20kHz  $\pm$ 2dB). Impedance is electronically balanced XLR at  $>10k\Omega$ . The KH 120A weighs 13.7 pounds and measures 10<sup>7</sup>/<sub>8</sub>"(H) x 7<sup>1</sup>/<sub>8</sub>"(W) x 8<sup>5</sup>/<sub>8</sub>"(D).



860-434-5220

[www.neumannusa.com](http://www.neumannusa.com)  
[neumlit@neumannusa.com](mailto:neumlit@neumannusa.com)

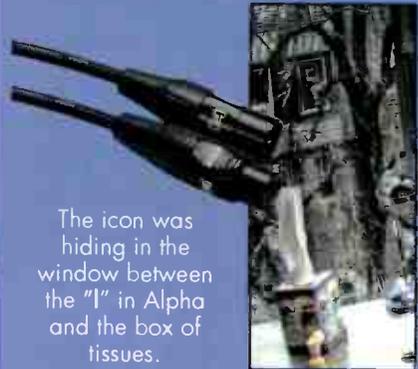
## Find the mic winner March issue

Congratulations to  
**Jerry Kylo**

of Washington State University,  
Pullman, WA.

His name was drawn from the  
correct entries for the March issue.

He won a 3-pack of Hosa  
HMIC-025 cables.



The icon was  
hiding in the  
window between  
the "I" in Alpha  
and the box of  
tissues.

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

No purchase necessary. For complete  
rules, go to RadioMagOnline.com.

### It Speaks for Itself.



The ASI5211. Not another dumb card. With a microphone input, including a low noise pre-amp and 48V phantom power supply, on-board DSP, increased analog I/O level of +24dBu and a new GPIO that adds two opto-isolated inputs and two normally open relay outputs, the ASI5211 is one smart card. And considering it's priced the same as cards without all these features, it's one smart choice, too. For information, call +1-302-324-5333 or email [salesasi@audioscience.com](mailto:salesasi@audioscience.com).

#### ASI 5211 features:

- +24dBu balanced analog and AES/EBU I/O
- 24bit A/O and O/A converters
- 16, 24, and 32bit PCM formats
- Up to 4 cards in one system
- Mic input with 48V phantom power
- Parametric Eq and Compressor/Limiter
- 2 in, 2 out GPIO
- Windows XP, 7 and Linux drivers

### Advanced Wattchman Monitor®/Alarm For Analog and Digital Broadcasting



The Model 81094 is the first in a series of Internet/Intranet accessible Advanced Wattchman® Wattmeter/Alarm systems that will monitor both forward and reflected power in two transmission lines with only one controller. Unlike previously available systems that needed one controller for each transmission line, the Advanced Wattchman® will monitor two lines (4 ports). The front panel display shows power on both systems simultaneously. Operating conditions may also be displayed on a PC from any location on the Internet/Intranet.

It is designed to work with a series of specialized line sections from 7/8" to 6-1/8" and standard Coaxial Dynamics elements for either analog or digital applications.

**Coaxial Dynamics** 6800 Lake Abram Drive • Middleburg Hts, OH 44130  
 Phone: 440-243-1100 Toll Free: 800-COAXIAL Fax: 440-243-1101  
[sales@coaxial.com](mailto:sales@coaxial.com) • [www.coaxial.com](http://www.coaxial.com)

BUILT FOR BROADCAST

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

**AUDIOSCIENCE**  
Engineering Excellence

# The Perfect Combination

we are LPFM

Available from



[www.scmsinc.com](http://www.scmsinc.com)  
**1-800-438-6040**  
[sales@scmsinc.com](mailto:sales@scmsinc.com)

MidSouth: 1-877-391-2650  
SouthAtlantic: 1-770-632-1295  
NorthEast: 1-315-623-7655  
Central: 1-731-695-1714  
NorthCentral: 1-513-376-8600  
SouthWest: 1-210-775-2725  
MidWest: 1-513-899-3036  
West Coast: 1-866-673-9267  
Pro Audio: 1-877-640-8205  
Latin America: 1-760-650-1427  
Bradley Div.: 1-800-732-7665

## FM Transmitters



BW Broadcast range of FM transmitters is perfect for LPFM. Offering transmitters from 1 watt to 1500 watts. BW Broadcast transmitters are reliable, efficient and full of great features. For peace of mind all our products come with our 2 year warranty.

## Audio Processors



The BW Broadcast range of audio processors are popular with broadcasters around the world. Powerful and dynamic our processors guarantee your station will make an impression on your listeners whether in FM, AM or HD.

The perfect combination  
for your  
Low Power  
Radio Station

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

**bw broadcast**





### Mic preamp module Daking Audio

**Mic Pre 500:** A single-channel microphone/instrument preamplifier module, the Mic Pre 500 is designed for installation in 500 Series format equipment. The new mic pre features switchable phase, 20dB mic input pad, +48V phantom power, and a selectable 1/4" line/hiz instrument input. It shares the gain structure and Class A, fully discrete transistor circuitry design of the Mic Pre IV. The front panel controls include a variable high-pass filter (0-200Hz) as well as continuously variable input gain. It also includes an eight-segment tri-color LED meter with simultaneous VU and peak is included.

702-365-5155; [www.daking.com](http://www.daking.com); [sales@transaudiogroup.com](mailto:sales@transaudiogroup.com)

### Silence monitor and backup audio player Deva Broadcast

**DB8000:** The basic principle of DB8000 is that this unit can detect silence and start playback of a preliminary created playlist on its built-in MP3 player. The MP3 backup audio files and playlists can be uploaded in the DB8000 from a PC using any FTP client. The audio storage capacity is 2GB. It also provides additional security in case of loss of audio at the inputs. The audio backup is presented as an integrated auxiliary audio input. The unit has DTMF remote control features.

+359 56 820027; [www.devabroadcast.com](http://www.devabroadcast.com); [sales@devabroadcast.com](mailto:sales@devabroadcast.com)

## Largest Inventory. Same Day Shipping. That's BSW!



### The Next Classic

The Electro-Voice RE320 sounds fantastic.

- Bright hi-end, smooth low end, perfect for on-air use
- Unique dual-voicing switch selects from two response curves
- Elegant black finish
- Try it, you'll like it

RE320 List \$499.95 **\$299!**



### The Time to Buy YOUR EAS Gear is Now!

Since time is getting short to upgrade your EAS gear, make it easy on yourself with the ultimate no-brainer: the Sage Digital ENDEC!

- Our most popular encoder/decoder
- 6 audio inputs, 6 serial ports, 5 GPIO inputs
- Plug-in compatibility to support seamless upgrades ensures full EAS compliance, now and into the future

DIGITALENDEC List \$2,695.00

**SAGE**

**Call BSW Today!**

broadcast gear from people you trust



Lowest Prices and Largest Inventory on EVERYTHING For Broadcast

**BSWUSA.COM 800-426-8434**

### Portable mic preamp Fostex

**FM-1:** A portable microphone preamp for ENG and field use, FM-1 also offers a powerful microphone gain limiter. Features include: mic input with steppable gain trim (9 steps, 5dB between -3dBu and -70dBu); limiter (maximum -55dB) with ultra low distortion; HPF switchable between 80Hz and 160Hz; flexible output (0 to -7dB) at +4/-10/-60dBu with peak overload LED indication; headphone monitor output; and it is P48V and T12V powered.

800-7-FOSTEX; [www.fostexinternational.com](http://www.fostexinternational.com); [sales@fostex.com](mailto:sales@fostex.com)



### User-controlled radio Jelli

**iPhone app:** With the Jelli iPhone app, fans can control what gets played on FM radio or streamed live through the app anytime and anywhere. Jelli is a social music experience that lets listeners control what plays on the radio from the Web and now the Jelli iPhone app. Jelli users vote for the artists and songs they love and want to hear, together creating dynamic playlists that determine in real time what will play online and on FM radio stations across the country. The iPhone app features station and song browsing, song voting, the ability to move songs up or down on a playlist and DJ credits.

[www.jelli.net](http://www.jelli.net); [feedback@jelli.net](mailto:feedback@jelli.net)

### Versatile Remote Control

The Broadcast Tools WVRC-4 is a cost-effective, half-rack solution for web based and/or recordable voice response dial-up transmitter site control.

- 4 channels
- Status, silence sensor, temperature sensor and power failure inputs
- Routes different input alarms to different email recipients
- Browser based 100-event program scheduler for relay control and alarm muting
- FIFO 8192-event alarm logger

WVRC4 List \$649.00

**\$499!**



"You have the exact answers I need. Thanks for sharing the cranium brainium whiz bang cyclotron with me. Every minute spent speaking to with you is GOLD .. Lots of Gold. There is no Plan B - only BSW"

**Burt West**  
Burt West Voice Overs, Aptos, CA



# SkimmerPlus

## Skimming, Logging and Air Checks with ease.

### SkimmerPlus Features

- Creates high-quality and highly compressed files simultaneously
- Supports multiple professional audio formats, such as PCM MP2, and MP3
- Supports recording from triggers
- Automatically manage hard drive space
- Up to 24 record decks available
- Individually customizable title bars and record features for each deck
- Create and save event logs for fully customizable unattended recording
- Control over record break points for long-term recording
- Central skimming for multiple-station clusters

### Web Server Features

- Access mic checks from the Internet with Web Interface
- Emailing of ftp links or audio files from Web Interface
- Supports user account creation
- Easily browse recordings with an intuitive web design
- Listening to last week's records is just a calendar's click away

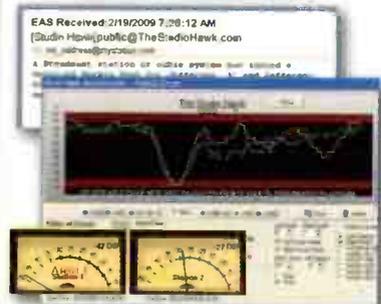
[www.bsiusa.com](http://www.bsiusa.com)



For More Information Call: 1-888-BSI-USA-1 ~ Email: [sales@bsiusa.com](mailto:sales@bsiusa.com)

## GALLERY

Your low cost solution to monitoring audio and EAS receivers!



Whether providing scheduled, detailed, dead air reports for local management, or as it's currently being used to monitor one of the industry's largest satellite teleports, The Studio Hawk is a power-packed product exceeding expectations.

**THE STUDIO HAWK**

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

## Leading the HD Radio Revolution!



FM Antennas  
Combiners  
Filters  
HD Radio

## Shively Labs

[www.shively.com](http://www.shively.com)  
[sales@shively.com](mailto:sales@shively.com)

888-SHIVELY Fax (207) 647-8273

## BROADCAST MAGNETICS

- New, Rebuilt, Retrofit
- Plate, Filament
- Transformers
- DC, AC Chokes
- 1Ph, 3Ph, Toroidal



**Magnetic Specialties, Inc.**

192 Keystone Drive  
Telford, PA 18969  
Phone: 267-384-5231  
Fax: 267-384-5236

Email: [info@magspecinc.com](mailto:info@magspecinc.com)

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

**Dixon Systems Inc.** Introducing the **NEW AES-1-10**  
**Low cost, high performance digital to analog converter!**



CLK-26  
 CLK-20C  
 AES-1-10  
 NM-250 MKII USB  
 Now in Broadcast Grey  
 Pro USB  
 AT-22 Tuner

**www.dixonsystems.com**  
 See your dealer or call TOLL FREE: 1-800-387-6141  
 Visit: **www.torpeytime.com** for our complete line of clocks & timers



**MOORETRONIX**  
 BROADCAST & INDUSTRIAL ELECTRONICS

## Our 5th Year

Our client list continues to grow. Thank you for your confidence and equipment purchases.

## We Re-Condition

Pacific Recorders BMX I-II-III, AMX, ABX and RMX, Stereo-Mixer and Mixer News-Mixer products.

Now available, the MOORETRONIX GPI interface.



This is a direct replacement for the PR&E CI-2 interface. Use where OPTO ISOLATION is needed between your device and console logic. Each module comes with connectors, pins and instructions. Optional mounting panel for 8 modules and 2 Warning Light relays.

**Tel: 800-300-0733 Fax: 231-924-7812**  
**WWW.MOORETRONIX.COM**

**FCC Certified FM Stereo Transmitters**



**GET ON-THE-AIR. STAY ON-THE-AIR!**

- ✓ 50W RF output continuous duty!
- ✓ Auto protect, auto soft fail, auto restore!
- ✓ Automatic battery backup!
- ✓ Digital display of all parameters!
- ✓ Simple to install!

What's the bottom line? To stay on the air! The PX50 was designed with that in mind! Auto monitoring of all parameters, with automatic power reduction and restore on VSWR and temperature errors! No more down time AND no more trips to the tower site! Plus the PX50 is FCC Certified under parts 2, 73, & 74 (PF3PX50) and Industry Canada approved (IC: 4318A-PX50) so you never have to worry about non compliance! Make your life easy with the PX50 from Ramsey!

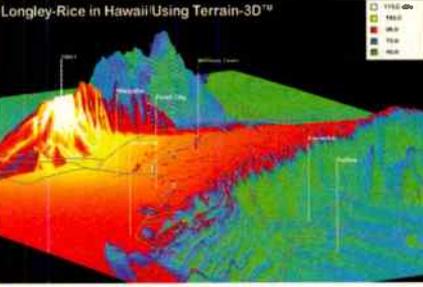
**THE ORIGINAL... "STATION-IN-A-BOX"**

Since the introduction of our "Station-In-A-Box" hundreds have been put in service worldwide! From temporary locations, rapid deployment installations, to emergency broadcast facilities, there is no quicker way to get on the air!

Custom designs include full audio production and control, record and playback of CD's, CD-R's, MP3's, MD's, and cassettes. Quick deployment antennas with LMR cable make installation a breeze. When you simply have to get on the air anywhere, rely on the proven and original "Station-In-A-Box" from Ramsey!

**RAMSEY ELECTRONICS, LLC**  
 590 Fishers Station Drive, Victor, NY 14564  
 800-448-2295 • 585-324-4560  
**www.ramseybroadcast.com**

## Broadcast Engineering Propagation Software



Longley-Rice in Hawaii Using Terrain-3D™

**Professional software packages for FCC applications and predicting coverage.**

- Create stunning "real-world" coverage maps and interference studies using Longley-Rice, TIREM, ITU-R P.1546-1, PTP, FCC and others with Probe 4™
- Search FM channels under spacings and contour protection using FMCommander™
- Prepare AM skywave and groundwave allocations studies and map FCC contour coverage using AM-Pro 2™
- Plot STL paths and coverage over 3D terrain with Terrain-3D™

**VSoft**  
 COMMUNICATIONS  
 I.P. Communications Software and Engineering Consulting

The leader in broadcast engineering consulting software.

**www.v-soft.com 800 743-3684**

**from MILLIWATTS to KILOWATTS™**



## Transmitting & Audio Tubes

## Semiconductors

Taylor  
 Eimac  
 Amperex  
 MA/Com

**Immediate Shipment from Stock**

Motorola  
 Toshiba  
 Thompson  
 Mitsubishi

• Se Habla Español • We Export

**760-744-0700 • 800-737-2787**  
 Fax: 760-744-1943  
**www.rfparts.com**

E-mail: [rfp@rfparts.com](mailto:rfp@rfparts.com)



**RF PARTS COMPANY**

## TWO CUTTING EDGE MONITORS TO HANDLE YOUR FM MONITORING NEEDS IN THE 21<sup>ST</sup> CENTURY FROM THE COMPANY YOU HAVE KNOWN AND TRUSTED FOR OVER 45 YEARS

### THE AWARD WINNING, ACCLAIMED

#### FMHD-1

POWER INCREASE READY WITH "NEW" USER ADJUSTABLE MASK  
VERSION 4.0 SOFTWARE AVAILABLE NOW!



- Direct Sampling of the FM RF Carrier
- Digital FM Carrier Demodulation
- Frequency Agile on both Antenna & High Level RF Inputs
- RF Spectrum Analysis with FFT Power Band Calculations
- Metering of Analog Total, Pilot, L, R, L+R, & L-R
- Metering of HD L/R/L+R/L-R Audio
- Time Alignment Cross Correlations Analysis  
±16384 Samples, ±375 ms
- HD Control and Status Information
- HD SIS and PAD Data
- BER (bit error rate) Measurements
- RJ-45 Ethernet Interface with Remote PC Software

### THE ALL NEW FM SOLUTION

#### FMCS-1

ALL-IN-ONE FM MODULATION MONITOR



- Direct Sampling of FM RF Carrier
- Frequency Agile on both Antenna & High Level RF Inputs
- AM & Sync AM Noise Measurements
- Variable BW Digital IF Filtering
- Digital FM Demodulation with 100dB 75µs SNR
- Variable BW Composite Filtering
- Digital Stereo Demodulation with 100dB L/R Separations
- Full Metering of Analog Peak and RMS Values
- RDS Injection and Full Data Decoding
- Two Digital SCA Decoders
- RF, Composite and Audio FFT Spectrum Analysis
- RJ-45 Ethernet Interface with Remote PC Software



VISIT [BELAR.COM](http://BELAR.COM) FOR THE LATEST PRODUCT INFORMATION & SOFTWARE UPDATES!

"When accuracy counts, count on Belar" • 610-687-5550 • [sales@belar.com](mailto:sales@belar.com) • [www.belar.com](http://www.belar.com)

## Transcom Corporation

Fine Used AM & FM Transmitters  
Authorized Representatives for all major equipment manufacturers

USED FM TRANSMITTERS	
250 W	2007 Crown FM250T, with internal stereo generator and tri-band processor, solid state
3.5+1.75KW	2007 BE FMI301, solid state
4 KW	2007 BE FM4C, solid state
14+5 KW	2005 BE Fmi1405 (XPi10 & Idi10) FM & HD, solid state
20 KW	2005 BE FM20S, solid state
25 KW	1986 Harris FM25K, solid state IPA
25 KW	2005 Harris HT25CD
30 KW	1990 Continental 816R-6C, with new dual solid-state IPA

USED AM TRANSMITTERS	
10 KW	1988 NauteI Ampfet ND10

Please see our current listings on our website

**NEW TV TRANSMITTERS**  
Visit our website for the latest sales  
**Special Discount Pricing On:**  
VHF and UHF TV Antennas (10w to 10kW)  
TV STL

**USED MISC. EQUIPMENT**  
Used Bird Wattmeter with Elements  
Orban Optimods 8200, 8100XT, 8100A  
BE FC30, SCA Generator

**EXCITERS**  
(2008) BE FM100C exciter,  
**new, never used!**  
Used BE Fxi-250 FM & HD Exciter  
with Engine card  
Used BE XPi 10, HD Generator

Please visit our web site, [www.fmamtv.com](http://www.fmamtv.com) for current listings or  
CALL US FOR A QUOTE!

2655 Philmont Ave. Suite 200, Huntingdon Valley, PA 19006  
800-441-8454 215-938-7304 Fax: 215-938-7361

## MULTI-STATION CONTROL for your Endec



- \* Control up to 3 additional stations for a total of 4
- \* Compatible with both the original SE1822 & the new Digital 3644 when used in the analog audio mode
- \* Both rack mount (MSRA-RM) and table top (MSRA) units available
- \* Master & individual station recessed front panel EAS audio gain controls
- \* Individual left and right channel LED EAS activity indicators for each additional station
- \* Test button for easy audio gain setup
- \* Screw type pluggable Eurostyle connectors for positive and secure connections
- \* Fail Safe contacts in case of a power failure

**and the best part is the price!**  
**MSRA-RM only \$549.00**  
**MSRA only \$489**

For details on these and other innovative products for the broadcaster, call or visit us on the web at:

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

2174 Chandler St. Camarillo, CA 93010  
805-987-7881 800-249-0487

RadioMagOnline.com

## Pinching shouldn't be painful.

Our competition may have led you to believe that you know them, or that you can trust them. But the plain truth is that they just want your cash, and lots of it!

In a time when cash is scarce, a better concept in sales, perhaps a more progressive one, is to work for a smaller profit and pass the savings along to the customer.

Realize the savings you can put in your pocket.

Call, click, or stop by Progressive Concepts today!



**THE BEST IN BROADCAST ELECTRONICS SINCE 1980**



**progressive concepts**

305 South Bartlett Road • Streamwood, IL 60107

www.progressive-concepts.com

(630) 736-9822

## CircuitWerkes Web Power!



### SiteSentry2 - \$329 Transmitter Controller

With 2 analog meter inputs, 2 status inputs, an audio sensor & onboard temperature sensor, you can monitor your site from any Web browser, anywhere! Six relays (2 DPDT & 4 SPST) give ample control for many stations. Automatically detects meter low & meter overload conditions for metering inputs, audio monitor and temperature sensor.



### Sicon-8 - Web & Dial-up Remote Control

The Sicon-8 lets you control your site via Internet with its internal Web server, via telephone, auto-answering cell phone or our free software. Setup is a breeze using the Siconcontroller software that also includes scripting, e-mail alerts, multi-site management, virtual metering & more!



### Silence Sentinel - Audio Monitor w/Web

Silence Sentinel ushers in a new era of analog audio monitoring. Monitor your audio from any Web browser. When silence is detected, it can perform user-programmed, automated, sequences of relay actions & can also respond to user control via the network or via external status inputs.

**Get info on these & other great remote control products at [www.circuitwerkes.com](http://www.circuitwerkes.com)**

## LOW PROFILE MIC BOOMS

AMB-23-4

HMB-14-4



Ideal for studios that require non-restricted eye contact.

Great for Radio Studios that are on camera.

**STUDIO ITEMS INC**

**815-669-2070**



**Acoustics First**  
-SOUND AND NOISE CONTROL MATERIALS-  
Toll-Free Number: **888-765-2900**  
[www.AcousticsFirst.com](http://www.AcousticsFirst.com)

**RadioMagOnline.com**



**Radio**  
THE RADIO TECHNOLOGY LEADER  
ONLINE RESOURCES FOR RADIO PROFESSIONALS

Find everything *Radio* magazine has available by product category or by section – online.

Developed by the editors of *Radio* magazine, our one-stop categories give you quick access to all the great information you expect from *Radio* magazine. Each one-stop offers Field Reports, technology reviews, features, applications and more.

**Radio magazine one-stops include sections on:**

- Mics
- IP Audio
- HD Radio
- Consoles & Mixers
- Automation
- Streaming
- Codecs

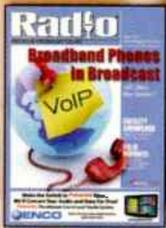
and more!

Exclusive sponsorships of *Radio* magazine one-stops are available. Contact your *Radio* magazine market manager today.

**Get your own copy!**

Each month, the *Radio Technology Leader* brings you the latest must-read information about radio broadcasting:

- FCC Update
- Managing Technology
- Trends in Technology
- Facility Showcases
- Field Reports
- New Products
- RF Engineering



**Radio**  
THE RADIO TECHNOLOGY LEADER

To start your own FREE subscription, go to [www.myradiomag.com](http://www.myradiomag.com) and complete the online form TODAY!

# Radio

THE RADIO TECHNOLOGY LEADER

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

**Editorial**

Editor – Chriss Scherer, CPBE CBNT, [cscherer@radiomagonline.com](mailto:cscherer@radiomagonline.com)  
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  
Lee Petra, Legal

**Contributors**

Doug Irwin, CPBE AMD; Chris Wygal, CBRE

**Corporate**

President and CEO – Steve Palm  
Chief Financial Officer – Paul Mastranardi  
Controller – Jack Liedke  
Group Circulation Director – Denise Rabbins  
Vice President of Web Development – Joe Ferrick

**Video/Broadcast Group**

Executive Vice President – Carmel King  
Vice President of Sales/Group Publisher – Eric Trabb

**Administration and Production**

Editorial Director – T. Carter Ross  
Production Director – Davis White  
Production Publication Coordinators – Karen Lee, Carolina Schierholz  
Advertising Coordinator – Caraline Freeland

**Circulation**

Associate Circulation Director, Audience Development – Tracey Dwyer  
Circulation Manager – Kwentin Keenan  
Circulation Coordinator – Michele Fanville

**Advertising Sales Representatives**

Associate Publisher, U.S. Sales – Steven Bell  
[sbell@nbmedia.com](mailto:sbell@nbmedia.com) | 212-378-0400 x 519  
Southern Europe, Africa, Middle East – Rataella Catabrese  
[rcatabrese@broadcast.it](mailto:rcatabrese@broadcast.it) | +39 02 9288 4940  
UK, Ireland, Central and Northern Europe – Graham Kirk  
[gkirk@audiamedia.com](mailto:gkirk@audiamedia.com) | +44 1480 461555  
Japan – Eiji Yashikawa  
[collems@world.odn.ne.jp](mailto:collems@world.odn.ne.jp) | +81 3 3327 5759  
Asia-Pacific – Wengong Wang  
[wwg@imaschina.com](mailto:wwg@imaschina.com) | +86 755 83862930/40/50

**Member Organizations**

Sustaining Member of:

- Audia Engineering Society
- Society of Broadcast Engineers

Member: American Business Media, The Missouri Association of Publishers

**A NewBay Media Publication**



NewBay Media, LLC  
28 East 28th Street, 12th floor  
New York, NY 10016

**SUBSCRIPTIONS:** Free and controlled circulation to qualified subscribers. Customer Service can be reached at: [newbay@computerfulfillment.com](mailto:newbay@computerfulfillment.com) or by calling 888-266-5828 (USA only) or 978-667-0352 (Outside US) or write us at Radio Magazine, P.O. Box 282, Lowell, MA 01853, USA. Back issues are available by calling Customer Service.

**REPRINTS:** Call or write Caraline Freeland, 5285 Shawnee Rd., Ste. 100, Alexandria, VA 22312-2334; 703-852-4610; Fax: 703-852-4583.

**PHOTOCOPIES:** Authorization to photocopy articles for internal corporate, personal, or instructional use may be obtained from the Copyright Clearance Center (CCC) at 978-750-8400. Obtain further information at [copyright.com](http://copyright.com).

Copyright 2011, NewBay Media, Inc. All Rights Reserved.

## Contributor Pro-file

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

This month: **Facility Showcase**, page 22.



**Michael Gay**  
IT/Project Manager  
Cumulus Media  
Atlanta

Michael Gay is a proud Purdue alumnus who specialized in embedded microcontrollers and digital signal processing. He has held his current position with Cumulus Media for the past five years where he has managed everything from HD Radio conversions to data center migrations. He prides himself on being able to play equally well in the IT/MIS realm as well as the broadcast studio/RF realm, which he considers a real asset for anyone given the direction the industry is headed.



Written by radio professionals  
Written for radio professionals

Radio Volume 17, Number 5 (ISSN 1542-0620) is published monthly by NewBay Media LLC, 28 East 28th Street, 12th floor, New York, NY 10016. Application to mail at Periodical Postage Price is pending at New York, NY and additional mailing offices. Postmaster: Send address changes to Radio, PO Box 282, Lowell, MA 01853.

	Page Number	Advertiser Hotline	Advertiser Website
Acoustics First	28	888-765-2900	www.acousticsfirst.com
Arrakis Systems	19, 26, 27, 33, 51	970-461-0730	www.arrakis-systems.com
AudioScience	40	302-324-5333	www.audioscience.com
Axia	21	216-241-7225	www.axiaaudio.com
Belar Electronics Laboratory	46	610-687-5550	www.belar.com
Broadcast Connection	31	970-482-9254	www.broadcastconnection.com
Broadcast Software Int'l	39, 44	888-BSHUSA-1	www.bsiusa.com
BSW	43	800-426-8434	www.bswusa.com
BW Broadcast	41	866-376-1612	www.bwbroadcast.com
CircuitWerkes	47	352-335-6555	www.circuitwerkes.com
Coaxial Dynamics	40	440-243-1100	www.coaxial.com
Comrex	9	800-237-1776	www.comrex.com
Day Sequerra	30	856-719-9900	www.daysequerra.com
Digital Alert Systems	28	585-765-1155	www.digitalalertsystems.com
Dixon Systems	45	416-261-3773	www.dixonsystems.com
DM Engineering	46	805-987-0487	www.dmengineering.com
Enco	29	800-ENCO-SYS	www.enco.com
Henry Engineering	15	626-355-3656	www.henryeng.com
Inovonics	25	800-733-0552	www.inovon.com
Jampro	38	916-383-1177	www.jampro.com
Logitek	7	800-231-5870	www.logitekaudio.com
Magnetic Specialties	44	267-384-5231	magspecinc.com
Mooretronix	45	800-300-0733	www.mooretronix.com
Myat	35	201-767-5380	www.myat.com
Nautel Electronics	23	902-823-5131	www.nautel.com
Noit Ltd.	42	505-327-5646	www.noitltd.com
Omnia	17	216-622-0247	www.omniaaudio.com
Progressive Concepts	47	630-736-9822	www.progressive-concepts.com
Ram Systems	42	800-779-7575	www.ramsystemsonline.com
Ramsey Electronics	45	800-446-2295	www.ramseybroadcast.com
RDL-Radio Design Labs	37	800-281-2683	www.rdlnet.com
RF Parts	45	800-737-2787	www.rfparts.com
Sage Alerting Systems	42	914-872-4069	www.sagealertingsystems.com
SCMS	20	800-438-6040	www.scmsinc.com
Shively Labs	11, 44	888-744-8359	www.shively.com
Studio Items Inc.	47	815-669-2070	www.ramsystemsonline.com
Telos Systems	13	216-241-7225	www.telos-systems.com
The Studio Hawk	44	662-324-2769	www.thestudiohawk.com
TieLine Technology	5	317-845-8000	www.tieline.com
Transcom Corp.	46	800-441-8454	www.fmamtv.com
V-Soft Communications	45	800-743-3684	www.v-soft.com
Wheatstone	2, 52	252-638-7000	www.wheatstone.com
Wide Orbit	3	281-252-8891	www.wideorbit.com
Yellowtec	24	+49 2173-967 30	www.yellowtec.com

This index is a service to readers. Every effort is made to ensure accuracy, but **Radio** magazine cannot assume responsibility for errors or omissions.



by Erin Shipps, senior associate editor

## Sample and Hold Top Radio Billers

Revenue for Station 2010 (x\$1,000)	Calls	Format	Market	Market Rank	Owner
57,225	WTOP-FM	News	Washington, DC	9	Bonneville*
54,000	KIIS-FM	CHR	Los Angeles	2	Clear Channel
49,000	WCBS-AM	News	New York	1	CBS Radio
46,000	KFI-AM	News/Talk	Los Angeles	2	Clear Channel
44,300	WLTW-FM	Lite AC	New York	1	Clear Channel
43,000	WHTZ-FM	CHR	New York	1	Clear Channel
42,500	WBBM-AM	News	Chicago	3	CBS Radio
41,000	WINS-AM	News	New York	1	CBS Radio
40,500	WFAN-AM	Sports/Talk	New York	1	CBS Radio
39,000	KROQ-FM	Alternative	Los Angeles	2	CBS Radio

According to recent estimates from BIA/Kelsey, WTOP-FM, the all-news station in Washington, was the highest billing station in 2010. BIA/Kelsey estimates that station billed more than \$57 million, providing news and information to its local market in a year with significant political and economic news to report. LA CHR station KIIS-FM was second with \$54 million. No other station billed more than \$50 million in 2010.

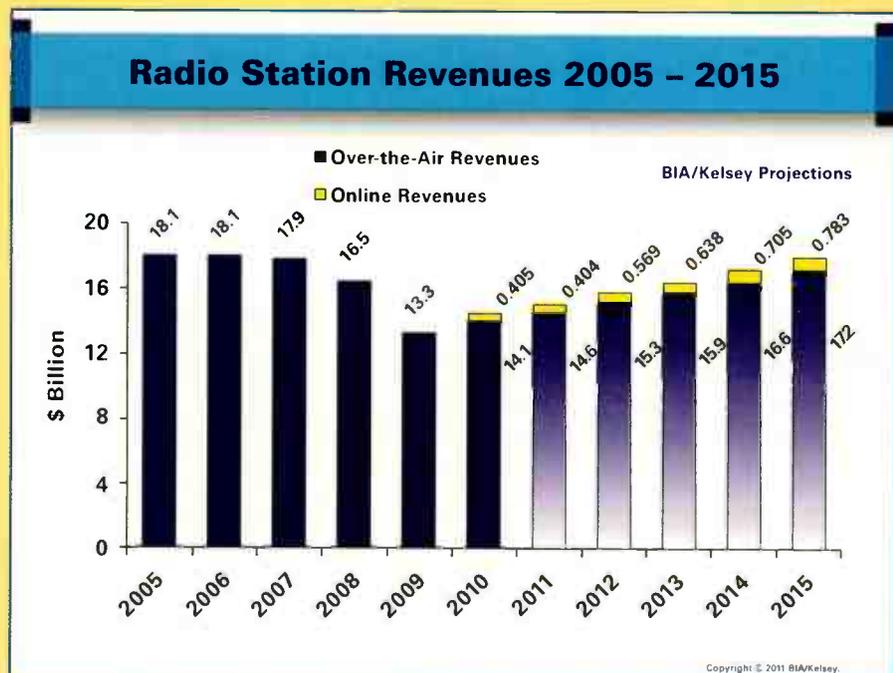
\* Bonneville currently plans to sell WTOP to Hubbard Broadcasting.



## 2010 Local Station Revenues

Over-the-air local radio station revenues hit \$14.1 billion in 2010, a 5.4 percent increase over 2009, according to this year's first edition of BIA/Kelsey's quarterly "Investing In Radio Market Report." BIA/Kelsey, adviser to companies in the local media industry, expects 2011 radio industry revenues to rise a moderate 3.7 percent, and 2012's election year to bump up

revenues 4.5 percent. The firm also projects online/digital revenues for radio will experience a 14.1 percent compound annual growth rate (CAGR) in the five-year period beginning 2011. Revenues from online/digital provided \$405 million to the industry in 2010 and are expected to rise from \$494 million this year to \$783 million by 2015.



Source: BIA/Kelsey

# ARRAKIS SYSTEMS INC.

**MARC-15-15**  
on sale \$6,499



15 channel modular console  
supports two phone hybrids  
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,  
15 stereo input switches  
with logic

**ARC-10**  
three models



ARC-10U: \$1,599 unbalanced  
ARC-10UP: \$1,995 unbal w USB  
ARC-10BP: \$2,495 balanced w USB

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

**ARC-15**  
only \$3,495



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

**'ACCENT'**  
studio furniture



**25% off**

all ARC consoles  
(except ARC-10U) feature built in  
PC USB sound cards and come with  
'Xtreme-Studios' live on air software

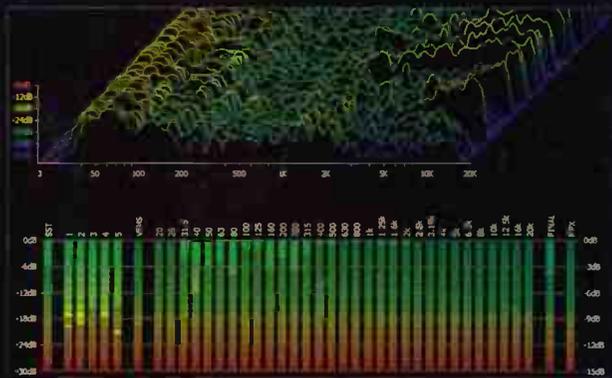
**'Pre-End of the World Sale'**  
the Mayan calendar predicts the end of  
the world in 2012... so Accent Furniture  
is 25% off until Dec 31st, 2011

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 money

# 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 oversibilant 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.