

# Radio

THE RADIO TECHNOLOGY LEADER

July 2009

RadioMagOnline.com



# Increased Power

Ready for  
a boost in  
HD Radio?

**FACILITY  
SHOWCASE**

Cumulus Cincinnati

**FIELD  
REPORTS**

Alesis Pro Track & Air  
Tools Voice Processor 2X

A Penton Media Publication

Make the Switch to **Presenter** Now...  
We'll Convert Your Audio and Data For Free!  
Introducing **Presenter**, Where Style Meets Substance.

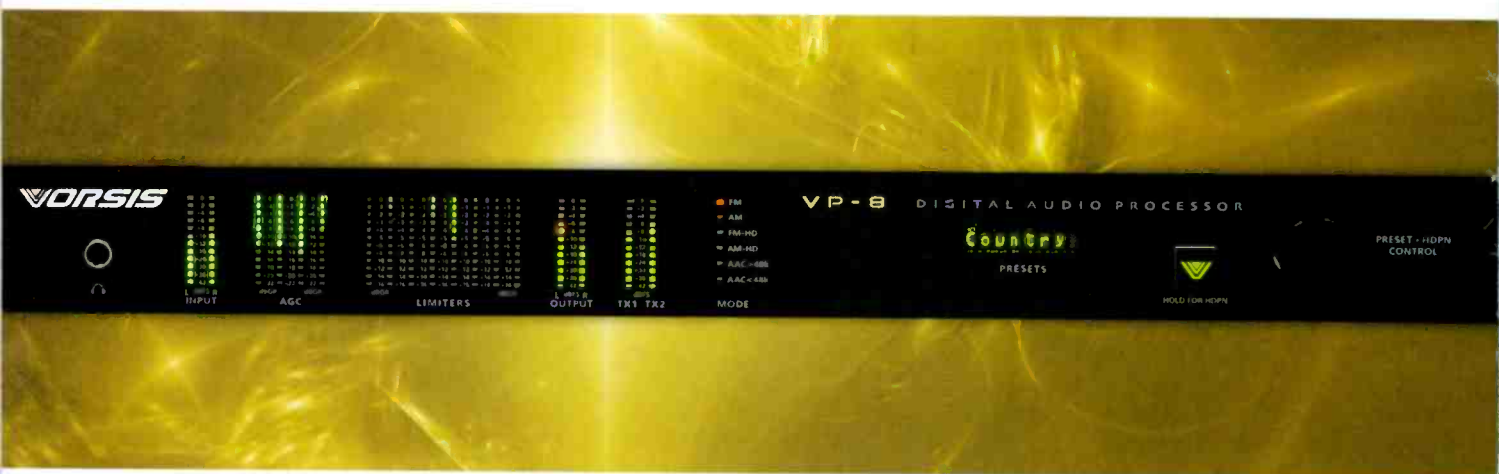


When Playing Audio Really Matters.  
(800) ENCO-SYS



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

"WOW, I COULDA HAD A VP-8!"  
 —RECENTLY DOWNSIZED STATION MANAGER



# VORSIS VP-8 IS THE BEST AUDIO PROCESSOR FOR UNDER \$3K. PERIOD.

The VORSIS VP-8 Digital Audio Processor delivers clean detailed sound at a great price. In fact, you can easily spend two to three times more and still not match the VP-8's performance.

Installation and setup takes only minutes. The VP-8 is loaded and ready to go for FM, AM, FM-HD, AM-HD, streaming, and studio processing. It's great sounding presets are carefully tailored for your format and media. No need to spend endless hours tweaking, the VP-8 will make your station sound great, right out of the box.

For FM stations, expect a sound that easily holds its own with your high-power major market competitors. Listeners comment that with the VP-8 they now hear the rest of the music! AM stations often experience a dramatic increase in coverage area along with greatly improved intelligibility and sound quality.

The VP-8 is also ideal for streaming audio, studio processing, as a versatile backup processor or as an STL protection limiter.

Of course, if tweaking is your thing, VP-8 lets you under the hood with a complete toolset – in the VP-8, nothing is hidden. With its 4-band AGC/compressor and 8-band limiter, the VP-8 boasts more bands than any other processor in its price range to give you a very clean, loud, competitive sound that doesn't destroy the music.

It also includes features rarely found even on top-of-the-line processors: a reference-grade stereo encoder for FM, built-in test oscillator, diversity delay, multi-point headphone monitoring, and extensive metering.

The bottom line? The VORSIS VP-8 gives more bang per buck than any other audio processor in its class (and then some). And since VORSIS is designed and built by Wheatstone here in the US, you know it'll hold up and be supported 24/7 for years and years.

Intrigued? Call us or visit us on the web to learn more or set up a demo. You'll be happy you did. VORSIS—more listeners listening more.



Radio has evolved. Your sound should too.™

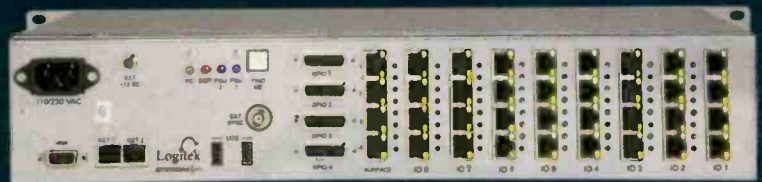
phone 1.252.638-7000 | www.vorsis.com | sales@wheatstone.com

Don't let the **hole**  
in your budget hold  
you back...



Reduced equipment budgets don't have to mean the end of your IP Audio projects this year. Logitek's JetStream Mini gives you the flexibility you need for audio routing, distribution and mixing – for about a third of the price you've come to expect. Everything you need is provided in one user-configurable 64-channel node, and we offer the latest networking protocols to make your implementation fast and easy.

**JETSTREAM** (MINI)



Call us at **800.231.5870** or check out  
JetStream IP Audio routing solutions at  
**logitekaudio.com** today!

  
**Logitek**  
Console Router Systems

## CONTENTS

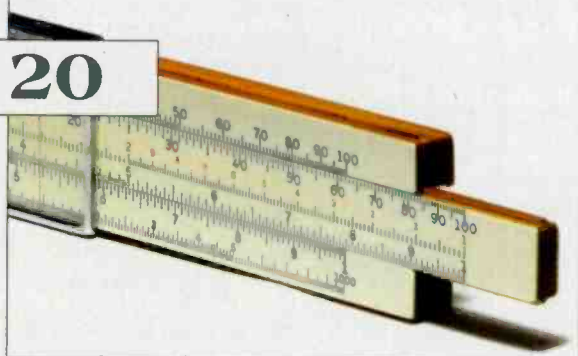
20



## Features

- 14** Trends in Technology: HD Radio Boost  
by Doug Irwin  
*Are you prepared for a digital sideband power increase?*
- 20** Facility Showcase: Cumulus Cincinnati  
by Name  
*Reduce, reuse, recycle is the name of this economy's game*
- 28** Tech Tips  
by Chriss Scherer  
*Tips, tricks, hints and more*

20



## Columns

- 8** Viewpoint  
by Chriss Scherer  
*The going is tough*
- 10** RF Engineering  
by John Battison  
*Thoughts about NEC 4-1*
- 12** FCC Update  
by Harry C. Martin  
*Ownership reporting requirements are changing*

32

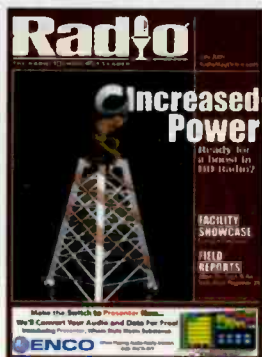


## Departments

- 6** Online  
at [www.RadioMagOnline.com](http://www.RadioMagOnline.com)
- 30** Field Report: Airtools Voice Processor 2X  
by Marshall Rice
- 32** Field Report: Alesis Pro Track  
by Pierre Lonewolf
- 34** New Products  
by Erin Shipp
- 40** Classifieds
- 41** Contributor Pro-File  
*Meet Marshall Rice*
- 42** Sign Off  
by Erin Shipp  
*Desireable features in 2009 cars and a 1926 Balkite ad*

### ON THE COVER

The impression from the 2009 NAB Show is this: Some amount of increase in digital power is inevitable. Are you ready? Start reading on page 14. Cover design by Michael J. Knust.



# **OUR** **BRIDGE-IT** **IS TURNING HEADS**

**The ultimate low cost, point-to-point and multipoint stereo IP audio codec**

- ➔ Perfect for STL's, backup audio links, IP audio distribution, audio monitoring, temporary remotes and multicasting links.
- ➔ The 'only' low cost IP codec with full front panel screen, keypad and navigation. You don't need a computer to use it.
- ➔ Broadcast quality analog and digital audio connectors you expect to find on more expensive codecs
- ➔ Automatic address book option. Connect Bridge-IT to the Internet and watch other codecs in your network appear on your screen just like Skype. Perfect for non technical people.
- ➔ Tieline's famous IP QoS performance engine for low delay, rock solid, CD quality audio connections over LANs, WANs, the internet, satellite IP, WiMax and WiFi links.

**Try it now FREE!**  
**Contact your favorite dealer**



**Tieline**  
www.tieline.com

Shipping July 2009

[www.tieline.com/Bridge-IT](http://www.tieline.com/Bridge-IT)

**800-950-0750**



# CONTENTS ONLINE

## Currents Online

Selected headlines from the past month.

### ➤ Senate Confirms Genachowski and McDowell for FCC

Genachowski replaces Kevin Martin, who stepped down earlier this year. Genachowski has worked for the FCC in the past, but has not served as a commissioner.

### National Radio Hall of Fame 2009 Posthumous Inductees

Jose Miguel Agrelot, Harry Kalas and Studs Terkel have been selected for posthumous induction into the National Radio Hall of Fame.

### BIA Survey: 2009 Radio Revenues Down from 2008

New estimates project 2009 revenues of approximately \$14 billion, a 15 percent decrease over last year, based on revenue reports from stations across the country.

### Ed Christian to Receive National Radio Award

At Saga Communications, Christian oversees 91 radio stations, five full-power and four network low-power TV stations, the Illinois, Michigan and Minnesota Radio Networks and the Michigan and Minnesota Farm Radio Networks.

### Prism Sound, Sadie Launch Summer 2009 Seminars

The seminars will fall into two categories – broadcast and music recording – with a date at each venue devoted to each topic.

### Nautel Adds Axia Livewire IP-audio to Transmitters

Nautel joins the list of Axia partners offering products that work with Axia IP-audio networks.



### Arbitron Adds TV Measurement in PPM

Arbitron has released ARB-TV, a suite of audience measurement services to measure away-from-home television viewing. The services uses the Arbitron Portable People Meter (PPM) to gather data.

## 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 Heil mic courtesy of Heil Sound.

We'll award a different Heil mic each month during 2009.



This month, enter to win a Heil Sound PR-30.

Enter by August 10.  
Send your entry to

**radio@penton.com**

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



**www.heilsound.com**

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

## Site Features

### Article Commenting

Ever wish you could speak directly to our authors? Want to make your voice heard on a certain topic of interest? Check out our article commenting feature at the end of every *Radio* magazine story online. We look forward to hearing from you!

### Radio Pick Hits

In case you've missed our Pick Hits coverage up until now, click on the Pick Hits button at the top of our home page to see the top 15 products from the 2009 NAB Show. And hey, it's our 25<sup>th</sup> anniversary!

### RSS, Facebook and Twitter

All the content at RadioMagOnline.com is available as an RSS feed, and through Facebook and Twitter.

- RadioMagOnline.com/rssfeeds
- facebook.com/pages/Radio-Magazine/57886938975
- twitter.com/Radiomagazine



# more PEACE OF MIND

more support. more reliability. more warranty.

It's Nautel's 40th anniversary and we're celebrating by offering you more protection on the world's most reliable transmitters. Buy a new NV or NX transmitter in 2009 and receive a five-year warranty.

Expect more. More warranty, more support through our new Quincy office and Memphis quick-ship parts depot. Plus more peace of mind.



See what more looks like at  
[nautel.com/expectmore/](http://nautel.com/expectmore/)

Making Digital Radio Work.



902.823.5131



## The going is tough

**W**e all know that the economy is in a rough state. It affects everyone in different ways, but there is one aspect no one can escape. It's not climbing prices or shrinking paychecks. It's not that serious, but it's certainly just as annoying. All the clichés come out in full force during difficult times.

You have no doubt heard all the statements that don't really do anything to help the situation. While reaching for the low-hanging fruit to get through the tough times, and prioritizing based on the return on investment are all good, we don't need to dwell on what we could do. Focus instead on what we are doing.

The economy in general has its problems, but the specifics for radio are easy to see: On-air ad sales are down so expenses are scrutinized if not eliminated altogether. Some companies are cutting back on salaries or working on reduced-hour work weeks with corresponding reductions in pay. Despite this reality, the pressure is on to keep the facilities at top form.

You're probably trying to do more with less (oops, another cliché). You're asked to make an ageing piece of equipment last just a little longer. You have to delay the studio project another few months. In short, you just have to get through the tough time until things get better.

There are some unfortunate consequences to the current belt tightening. One consequence often ignored is that once things are rosy again, the tight restrictions are kept in place. We made it work without spending money then, we can just keep going that way, right? You can only work in starvation mode for so long. From an engineering standpoint, it's important to recognize the overall situation and work within the available means, but it's also important to inform the manager or owner about the realistic details. You can make it work a little longer, but the day will come when it has to be replaced.

Of course it's easier and cheaper to replace something when you want to and not when you have to. If the project is put on hold, develop a new plan and timeline to restart it.

But difficult times have a more personal effect. With the added pressure, it's very easy to develop and project a bad attitude. While some

commiserating is therapeutic, too much of it does nothing to improve the situation. It often just makes it worse. Not only do you feel unmotivated, others may see you as no longer being a part of the team, or worse part of the problem by not trying to find a solution.

I mentioned reductions in work hours and pay earlier. The common answer is, "At least you still have a job." While that doesn't help the situation, it is true. (I know many people have lost their jobs, which is unfortunate, and I'm not making light of this point.) Another cliché that fits here is work smarter, not harder. Prioritize tasks, and get the maximum effect for the effort. Unfortunately, some of the pet projects – the fun part of the job – may have to wait.

This is a perfect time to develop new ideas. Sit in on a sales meeting. Have lunch with the sales manager or general manager. Bounce ideas off each other. There could be an engineering solution to a sales or revenue problem, and everyone will benefit from the effort. This could be a good time to launch a multicast channel or online stream. The equipment may already be in place.

As we look ahead for relief, we see the predictions: on-air ad sales look flat, but online has promise. The overall economic view predicts a better future. So pull out your favorite clichés just to have a chuckle, then roll up your sleeves and get back to making the radio magic.

*Chris Scherer*



LIVE & LOCAL

# Your Story Is Out There

Grab It LIVE with ACCESS!

In Fargo, ND there was more than enough news this past winter as floods ravaged the area. Armed with nothing more than an ACCESS and a mic, talk show host Scott Hennen was on the scene and on the air immediately.

Wherever there's breaking news, there's your story. And you don't need a full crew to grab it. As fast as you can get there, you can be live on the air, creating pinpoint, relevant programming that keeps an ever-growing number of listeners glued to their radios. ACCESS PORTABLE lets you send studio-quality live audio, real time over POTS, DSL, Cable, Wi-Fi, 3G cellular (EVDO/UMTS), 4G WiMax, satellite and more to make any remote broadcast really stand out.

There's nothing more vital than local— connect with your audience from anywhere with the easy to use, handheld ACCESS PORTABLE!



Put Comrex On The Line.

**COMREX**

19 Pine Road, Devens, MA 01434 USA Tel: 978-784-1776 • Fax: 978-784-1717 • Toll Free: 800-237-1776 • [www.comrex.com](http://www.comrex.com) • e-mail: [info@comrex.com](mailto:info@comrex.com)

⟨ACCESS⟩

# Thoughts about NEC 4-1

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

As the use of AM directional antennas began to become more widespread, a growing need was perceived for a more precise and less laborious method of designing these complex antenna systems. Up until that time most directional antennas were designed with the aid of a slide rule and or a mechanical calculator (the forerunner of the computer). The computer was in its infancy and a number of consulting engineers had constructed their own programs that took the place of the slide rule and its accessories when designing an AM directional antenna. As might be expected sometimes there were slight differences in the mathematical designs and algorithms. As a result, directional antenna designs produced by different algorithms using the same basic input might have very slight differences.

This was brought to my attention rather abruptly one day when an FCC engineer telephoned and said there was a slight difference between his figures and mine on a particular radial on a pending application. My results had been produced (illicitly) on a very large super computer. The difference was small, less than a quarter of a millivolt, but my figures didn't match the Commission's in this one instance. Fortunately, we settled the matter to our mutual

wave and skywave radiation patterns for a given set of operating conditions that I know of was provided by Dataworld. And it was very useful, but the problem remained that any change in the shape of the ground wave pattern nearly always changed the skywave values and required further ground wave computation ad nauseam. Several engineers developed their own programs and offered them for sale to other engineers. Many of these programs were very successful.

## An improved method

As time passed and DA design work received increasing attention, it became obvious that more information was needed about how the antenna worked in its environment once constructed. This led to antenna modeling and the use of method of moments calculations for directional antenna design. The mathematical wizards and the Lawrence Livermore laboratory began to develop programs using the NEC classification. NEC-2, developed by Jerry Burke, J. Poggio and J.L. Smith, offered a means of individually analyzing, in effect, the modeling of the antenna's actual operation and developed a starting set of values so that the array could be set-up and then manually brought into the desired operating conditions.

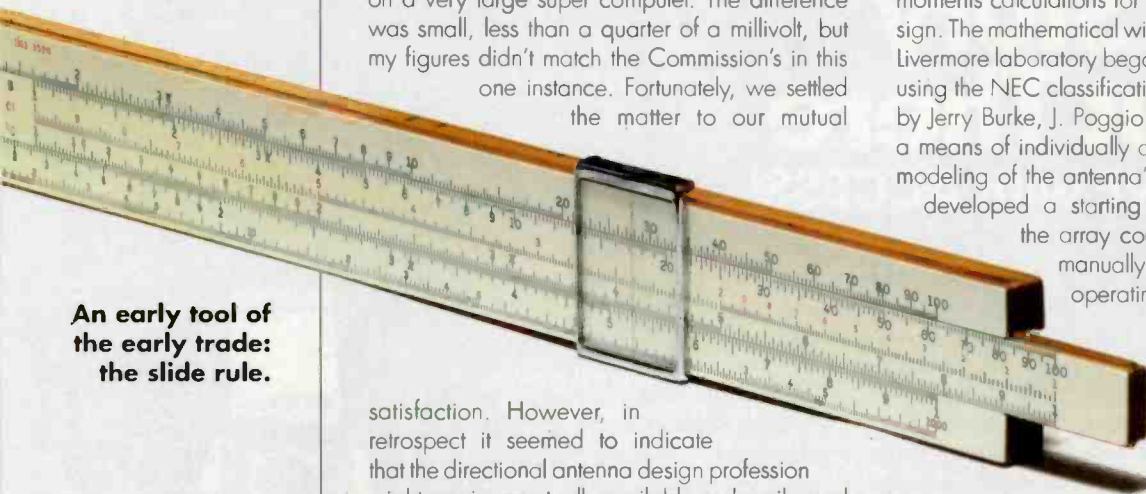
The root of the problem was perceived to be based on the fact that the original directional antenna parameters were developed on the basis

of mathematical calculations, which did not always precisely agree with the results obtained by modeling the proposed antenna system. Actual physical modeling was not always possible, nor results perfect, using scaled operating frequencies and model construction. It required a mathematically based modeling program, which took into account the physical differences and influences of the actual operating components in the system. Basic directional antenna design had been

An early tool of  
the early trade:  
the slide rule.

satisfaction. However, in retrospect it seemed to indicate that the directional antenna design profession might require a mutually available and easily used mathematical program.

At the time, computers were just becoming available to the common man, and if I remember correctly it was the old Radio Shack TRS-80 computer platforms that became the first computer exposure for many engineers. As computer production price and quality improved many engineers developed their own antenna programs in the old simple computer language. One of the earliest commercially available computer-generated ground




based on antennas with a single drive source. Broadcast DAs in effect use multiple sources to drive the various radiators of a multitower system because each antenna element either acts as a power source or in the case of a negative tower, a power subtraction.

In order to model complex structures it was necessary to combine two electric field integral equations (EFIE) for small wires and the magnetic field integral equation (MFIE) for plane surfaces. The EFIE works well for very thin wires with decreasing size. To ensure accuracy, segment wire lengths should be kept to less than 1/10 of a wavelength.

NEC was under development for more than 10 years and earlier versions were known as BRACT and AMP. It is basically a hybrid compilation that models objects in wire form using electric field integral equations, and a magnetic field integral equation when modeling closed surfaces that have time harmonic excitation. It is probably one of the most valuable tools available to antenna designers and a NEC-4 is written using Fortran 77. A user either purchases or licenses, the NEC-4 program and Lawrence Livermore includes a source code set up for the Intel visual Fortran compiler. In addition a slightly stripped down version is also included that should compile with most UNIX Fortran compilers.

(When using the UNIX version, it is necessary to type the file names rather than selecting them from a dialog box.)

Another Lawrence Livermore computer wizard named Kok Chen has developed an additional version that compiles with the free Fortran compiler on the Macintosh computer so that most users appear to be well covered. Chen can also supply a GUI named Cocool NEC that works with NEC-2. It's planned to develop a version for use with NEC 4-1.

Plotting programs are available (source and window executables) that will read the input or output files and plot the model, radiation, patterns and input impedance versus frequency with Windows executables that have been compiled for use with Windows. The code originally was designed for use with fixed sized arrays and executables have been compiled for a number of sizes up to and 11,000 x 10,000 matrix. Recently they have been including a version that allocates the matrix to a size controlled by an input command. One of the nice features of working with Lawrence Livermore seems to be the fact that Jerry Burke is available to provide invaluable information. 

E-mail Battison at [batcom@ohio.net](mailto:batcom@ohio.net).

**NEW!**  
for  
**STREAMING**



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



Professional Audio Processor / Sound Card

**Optimod-PC  
1101**

- Compact size for broader CPU selection
- A professional soundcard with a full featured OPTIMOD audio processor...the ultimate DAB streaming and mastering sound card
- Word Clock Support - Separate BNC clock sync input
- Full Windows mixer and metering support makes the 1101 the ideal sound card for Windows based playout systems designated for digital applications



Contact SCMS  
at any of its offices  
to discuss your needs  
**1.800.438.6040**  
Bob, Ernie, Matt, Mike or Andy  
HQ in Pineville, NC

Mid South	1.877.391.2650	Bob Mayben
Central	1.731.695.1714	Bernie O'Brien
West Coast	1.866.673.9267	Doug Tharp
Mid West	1.513.899.3036	Mary Schnelle
South Atlantic	1.770.632.1295	Art White
North East	1.315.623.7655	Jim Peck
South West	1.210.775.2725	John Lackness
North Central	1.513.376.8600	Pam Leffler
Pro Audio	1.877.640.8205	Ric Goldstein
Latin America	1.760.650.1427	Lily Massari
Bradley Division	1.800.732.7665	Art Reed/Bob Eburg

## FCC changing ownership reporting requirements

By Harry Martin

**A** new FCC ownership reporting system goes into effect Nov. 1, 2009. The current plan is for all commercial licensees – along with a variety of broadcast owners and investors previously exempt from any such filing – to file new reports on that date. The filing of biennial ownership reports for commercial stations on June 1, Aug. 1 and Oct. 1 has been suspended. Noncommercial educational licensees must still file the usual biennial reports on those dates.

The shift in reporting requirements, and a change to new reporting forms, arises from concern about the relatively low percentages of minority individuals and females among the ranks of broadcast owners.

The following changes have been made:

- All commercial licensees must file, even previously exempt stations owned by one person or a partnership of natural persons.

### Dateline

For *noncommercial* stations, in the following locations only, the biennial ownership report deadline is Aug. 1: California, North Carolina and South Carolina.

Aug. 1 is the deadline for radio stations in California with more than 10 full-time employees to electronically file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC.

Aug. 1 is the deadline for radio stations licensed in the following states to place their annual EEO Reports in their public files: California, Illinois, North Carolina, South Carolina and Wisconsin.

Nov. 1 is the deadline for submission of biennial ownership reports for *commercial* radio stations in all states and territories.

- Equity owners whose reporting exemption was based on the single majority owner rule must now report their interests.

- Equity owners whose interests would be attributable but for the higher EDP threshold for investors in minority-controlled companies (generally 50 percent vs. 33 percent) will not be exempt from reporting.

- Investors and affected lenders must not only report the names of the licensees and the stations owned by those licensees as at present, they must also provide the FCC-issued Federal Registration Number (FRN) for each and every licensee in which they have a reportable interest.

- The FCC will begin random audits to verify what is reported.

- Information will no longer be accepted in uploaded attachments to the ownership report form. Everything must be submitted on the ownership reporting form itself.

Implementation of this new regulatory scheme is dependent on speedy adoption of a new Form 323 and its approval by the Office of Management and Budget. It is likely that the Nov. 1 start date will have to be postponed if the form is not ready in time.

The Commission also has separately proposed revisions to the ownership report form (Form 323-E) for noncommercial educational (NCE) radio and TV stations to include information about the ethnic, racial and gender makeup of their governing bodies. In the meantime, as noted above, NCE licensees must continue to file their ownership reports biennially on the anniversaries of their renewal filing dates. The Commission is considering imposing ownership reporting obligations on LPFM licensees for the first time since that service was created.

*Martin is a member of Fletcher, Heald & Hildreth, P.L.C., Arlington, Virginia. E-mail: martin@fhhlaw.com*

- LPTV stations and Class A television stations are no longer exempt from reporting.

- All affected entities will file on the same date, every two years, beginning Nov. 1, 2009.

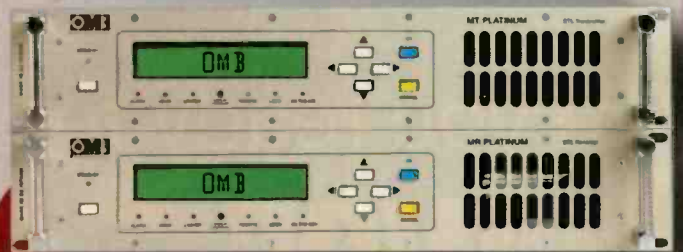
- The data reported must be accurate as of Oct. 1 of the same year in which the report is filed.



# FM TRANSMITTERS

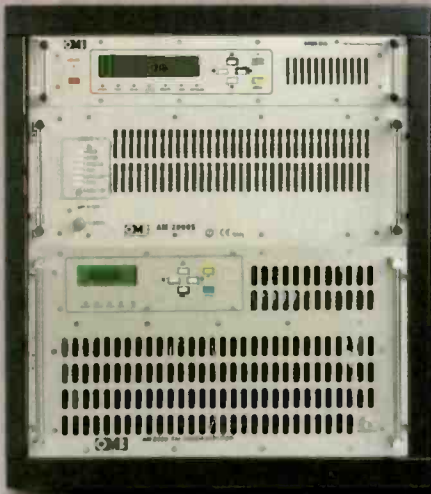
B R O A D C A S T

All transmitter powers with the best quality price ratio



## MT/MR PLATINUM

>1GHz is a high-performance Studio-to-Transmitter link. It is made up of the 5W MT transmitter externally synthesized in 10MHz sub-bands with a step of 100KHz, and the MR double conversion receiver, that is externally synthesized, too. The MT is microprocessor controlled, and includes LCD display for the visualization of the most relevant transmission parameters (frequency (6 digit), forward and reflected power, modulation level), balanced Mono, Stereo (MPX). The MR receiver has the same visualization system as the transmitter. It includes balanced Mono and Stereo (MPX) outputs. Furthermore, the MT/MR Platinum STL includes a jumper in order to get a proper operation with digital signals.



## EM 2000

is a 2000W FM transmitter made up of the EM 25 DIG exciter (or EM 20/30 exciter) and the AM 2000 FM amplifier. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules work independently thanks to a power combining structure that provides high isolation between them.

## EM 10000

is a 10000W FM transmitter made up of the EM 250 COMPACT DIG exciter and three control units which combine the power of six AM 2000 FM amplifiers. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules work independently thanks to a power combining structure that provides high isolation between them.

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



## OMB AMERICA

factory and laboratories  
phone. (305) 477-0973  
(305) 477-0974  
fax. (305) 477-0611  
3100 NW 72nd. Ave. Unit 112  
MIAMI, Florida 33122 USA

## OMB EUROPA

departamento comercial  
teléfono. 902-187878  
fax. 902-187878  
Avda. San Antonio, 41  
CUARTE DE HUERVA  
50410 Zaragoza, ESPAÑA

From september in:

fábrica y laboratorio  
teléfono. 902-187878  
fax. 902-187878  
Pol. Ind. Centrovía C/Paraguay, 6  
LA MUELA  
50196 Zaragoza, ESPAÑA

# Are you ready for a Power Increase?

By Doug Irwin, CPBE AMD

The digital sideband power for HD Radio may get a boost. Are you prepared for it?

In April of this year, the Corporation for Public Broadcasting engaged NPR Labs to undertake a further study of the potential interference effects of higher-power HD Radio transmissions on the analog FM radio service. The results of this study are expected by the end of this summer, prior to the NAB Radio Show that will be held in Philadelphia this year. Although I did not attend the 2009 NAB Show myself, several of my colleagues who did all formed the impression that some amount of increase in digital power is inevitable.

I'll look at the practical means by which a station can increase its digital power level. If your station is waiting until the dust settles prior to committing to the purchase and installation of an HD Radio transmission system, hopefully you can gain some insight in to what will be necessary when you do make the decision to go forward. Let's first review the common means used up until this point to get HD Radio transmissions on the air.

Probably the most common method of creating the hybrid HD Radio signal is by way of a high-power, -10dB, four-port injector installed between the output of the analog transmitter and the main antenna. The analog transmitter's power output needed to be increased by 10 percent to make up for losses through the injector; the HD Radio transmitter had an output that was 10 times the TPO needed to get the correct HD ERP, because the coupling of the high-power injector is -10dB (in other words, only 1/10 of the power inserted on that port of the injector, or -10dB, actually makes its way out of the injector and in to the main transmission line). The other 90 percent of the digital transmitter power was terminated in a waste load and dissipated as heat.



100kW to 500kW SW/DRM



HD Radio  
Licensed Manufacturer



10KW TO 80KW ANALOG  
10KW TO 60KW ANALOG/HD

CAN YOU HEAR ME NOW?

REALLY HIGH POWER  
RF SOLUTIONS -  
ONLY FROM...



Continental Electronics

www.contelec.com

sales@contelec.com

(214) 381-7161

www.rfspecialties.com



RF Specialties  
Group



Transmitters  
Antennas  
Audio Processing  
Consoles & Racks  
STL / RPU Systems  
Microphones

Audio Cable  
Combiners / Phasers / ATUs  
T-1 and IP Audio CODECS  
Racks / Cable Ladders  
Copper and Grounding Systems

HD Monitoring  
RF Analyzers  
Remote Control Systems  
Telephone Hybrids  
And MUCH more...

"RF" IS GOOD FOR YOU!

Call your nearest RF Specialties Office:

RFSCA San Diego CA Steve	619-501-3936
RFSCA Las Vegas NV Bill	888-737-7321
RFSCA San Francisco CA Paul	925-270-8939
RFSWA Mukilteo WA Walt	425-210-9196
RFSWA Vancouver WA Bob	800-735-7051
RFSTX Amarillo TX Don & Mo	800-537-1801
RFSTX Dallas TX Wray	888-839-7373
RFSMO Kansas City MO Chris	800-467-7373

RFSMO Raymore MO John	877-331-4930
RFSMO Richmond IN Rick	888-966-1990
RFSPA Ebensburg PA Dave	866-736-3736
RFSPA Pittsburgh PA Ed	866-412-7373
RFSPA Philadelphia PA Phil	888-737-4452
RFSGA Thomasville GA Chris	800-476-8943
RFSGA Crestview FL Bill	850-621-3680
RFSGA Murray KY Dave	270-767-7644

Fine Print: : The FIRST customer to call their favorite RFS office, and mention this AD, wins a \$10 Gift Card from Starbucks. Limit of ONE card from each of the above listed office. Previous winners not eligible.

# Power Increase

This method proved relatively easy, as long as the analog transmitter was sized adequately, and the facility could provide the extra ac power and air conditioning capacity. Because the analog and digital made use of the same antenna, the -20dB ratio between the analog signal and the digital signal was consistent for coverage throughout the listening area.

Another way to use the same antenna for digital and analog was to procure a transmitter that was a common amplifier – one that had the analog and digital signals common in its output. This of course required buying a new transmitter, and was somewhat limited in the amount of power it could supply – at least early on. The transmitter technology for HD Radio has moved along well in the last four years.

If a facility had a licensed auxiliary antenna that had a HAAT of at least 70 percent (and no more than 100 percent) of the main antenna, while being within three arc-seconds in both longitude and latitude, a station could use it to transmit the HD Radio signal. This ended up being a convenient method for some stations. I have used this method, and early on we were concerned that the -20dB ratio of digital to analog would not be consistent in the field due to the use of different antennas. In practice it did not turn out to be an issue though.

Finally, if the station had a high-power analog transmitter that lacked 10 percent headroom in its output capability, but you were determined to use the same antenna to transmit both signals, then Split-level combining was sometimes a way to go. A combined amplifier analog and digital transmitter was combined with an analog transmitter to develop the correct amount of digital RF and analog RF for a common antenna feed.

## Behind the power

Now that we've reviewed the common methodologies of HD Radio transmission used over the last five (or so) years, let's examine the implications of increasing the power. We'll assume the increase is 10dB, since this is the highest increase proposed. In fact it may be something lower (thus making the job of increasing the digital power somewhat easier).



ERI Lynx Series II



Dielectric HDR series

If the station uses high-power combining (with a -10dB injector) it is clear that you will not be able to increase the digital power by simply developing more power for the digital input port on the injector. Neglecting the injector specs momentarily, you would need a much larger transmitter (electrically and physically), a much larger waste load, more ac power capability and much more air conditioning.

On the other hand, if you could eliminate the need for the -10dB injector, then the current HD Radio transmitter is probably sized correctly for the amount of TPO needed, assuming you could get its RF into an antenna with the right amount of power gain. One potential solution then may be to replace the main antenna. The popular antenna manufacturers, including Shively, ERI, Dielectric and Jampro all make antennas with dual inputs (one for the analog carrier, and another for the IBOC carriers), providing the end-user with a convenient means by which the right amount of IBOC ERP can be achieved.

One performance parameter critical to the success of antennas such as these has been the isolation from the analog antenna input port to the digital antenna input port. If there is too little isolation, circulators are needed on the output of the digital transmitter to prevent too much of the analog power from getting back in to the digital transmitter, thus creating intermodulation artifacts that show up as spectral regrowth. It was pointed out to me that a 10dB increase in the digital transmitter power is now going to potentially cause problems with intermod generation in the analog transmitter output as well; and for this reason it will be very important to have good

isolation from the analog to digital inputs (as it has been) but also from the digital to analog inputs. This will be one critical specification to address with the manufacturer you consider.

## Antenna applications

ERI offers the Lynx antenna, which provides separate inputs for analog carrier and the IBOC carriers. The elements of the Lynx are all excited by both the analog and IBOC carriers; the antenna presents the same power gain for both. According to Tom Silliman of ERI, the Lynx is already capable of handling a 10dB increase in



power on its digital input. Published specs for the Lynx show that the two inputs are isolated from one another in excess of 30dB – but it should also be noted that the circulators ERI can provide for use with this antenna are rated up to 2,500W. (Higher power ones are available, according to Silliman.)

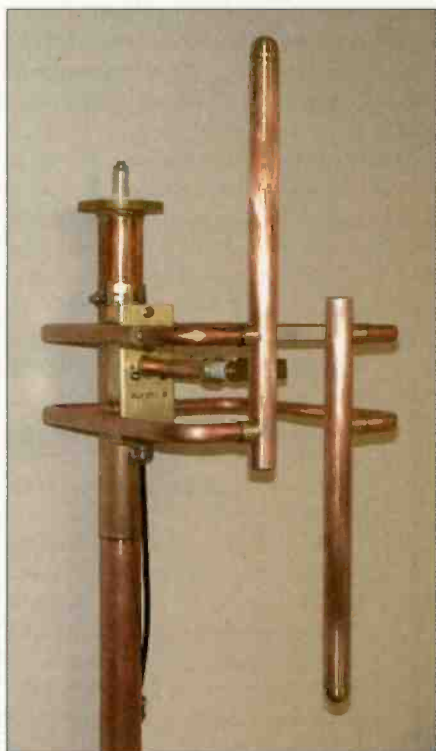
Dielectric offers its HDR series of interleaved antennas for IBOC and analog radio transmission. The two sets of antenna elements (with separate inputs of course) are configured for opposite circularity, which provides for a high amount of isolation from digital to analog and likewise from analog to digital. Matt Leland of Dielectric tells me that the digital input for the HDR is completely able to accommodate the proposed 10dB power increase for IBOC.

Shively Labs offers interleaved antennas as well, for example, its model 6813. The

IBOC input of this particular antenna will be able to accommodate the higher power IBOC levels.

Jampro offers its JSHD dual-input antenna for HD Radio. Like the other antennas previously mentioned, it has a separate input feed for IBOC, and thus has nice built-in redundancy. Greg Montano of Jampro told me that this antenna is also scalable for -10dBc IBOC carrier levels.

There are multiple instances around the country of the HD Radio signals being back-fed through an existing wideband combiner (such as the Shively 2540 used on top of Tiger



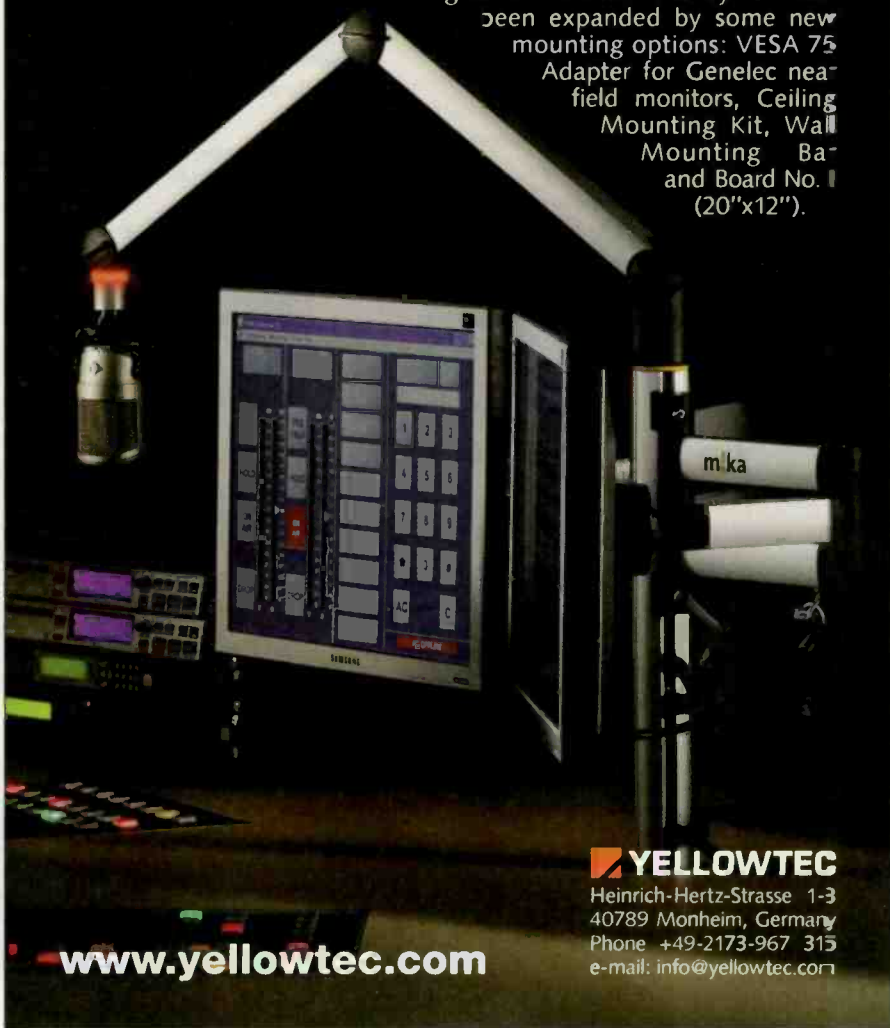
Shively Labs model 6813



Jampro JSHD

## m!ka MICROPHONE AND MONITOR ARMS

New accessories! Yellowtec's award winning product line for positioning microphones and monitors continues its growth. The modular system has been expanded by some new mounting options: VESA 75 Adapter for Genelec near field monitors, Ceiling Mounting Kit, Wall Mounting Bar and Board No. 1 (20"x12").



**YELLOWTEC**

Heinrich-Hertz-Strasse 1-3  
40789 Monheim, Germany  
Phone +49-2173-967 315  
e-mail: info@yellowtec.com

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

# Power Increase

Mountain in Seattle). Here in New York, we make use of a Shively combiner at our back-up transmitter site on top of 4 Times Square (although we don't transmit HD Radio from there). That system has been configured by John Lyons, the site's manager, as a back-fed system for the purposes of adding multiple HD Radio signals together for subsequent transmission by the Shively panel that is located there. I have learned from Bob Surette of Shively that this particular configuration can accommodate a 10dB increase in digital TPO; we would only need to size up the transmission line on the digital output side of the combiner. I point this out as a possible solution for some stations looking to achieve the 10dB proposed increase in digital power.

I also asked both Tom Silliman and Bob Surette if the hybrids used in their large panel antennas are able to accommodate the 10dB increase in digital power. In the case of the Shively antenna at 4 Times Square (at the very least), the answer was yes. Silliman also indicated that the answer was also yes in general for ERI panels but recommended a review and peak voltage calculation in each case.

## Perhaps a new transmitter

Of course another possibility (especially if you have not invested in HD Radio at all) is to go with a new combined amplifier transmitter. Several of the manufacturers of combined amplifiers have already published specs on their various transmitters' analog power limits with respect to the 10dB power increase. For example, the Harris Z12HD+ has an analog power limit of 2,876W in this mode. Its HT/HD+ (which is the vacuum-tube combined amplifier) tops out at just under 8,200W of analog power in this mode. Harris recently introduced the HPX40, which was designed with increased IBOC levels in mind. This transmitter will produce 16kW of

analog power in the -10dBc mode, making use of the standard PAPR algorithm.

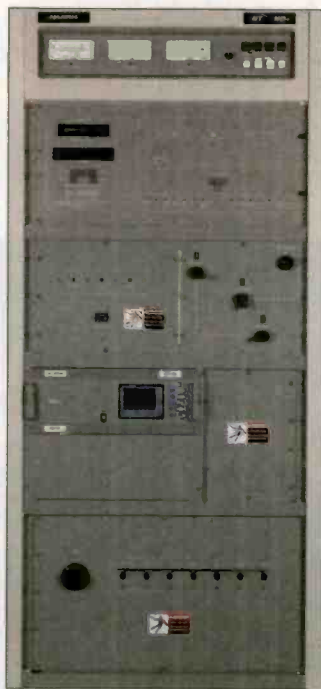
Nautel has developed a different version of the PAPR (peak to average power ratio) reduction algorithm for use in its IBOC transmitters and thus has different set of published specs for the amount of analog power its transmitters can generate in the -10dBc digital mode. For example, the NV20 will deliver up to 8.8kW of analog power in this mode; the NV40 will go up to 17.5kW.

I have learned from Broadcast Electronics that its current set of solid-state combined amplifiers can be operated in the -10dBc mode, with the obvious reduction in analog output power capability. Like BE, Continental Electronics is taking more of a conservative, wait-and-see approach as to where higher digital levels really end up before publishing elevated level performance specs on their vacuum-tube combined amplifiers.

If you currently use a separate antenna for HD Radio (often referred to as space combining) then your ability to move up in power by 10dB is probably going to depend mainly upon how much TPO you currently generate. If it was difficult to find the right amount of floor space, electricity or air conditioning for the current HD Radio transmitter, how easy is it going to be to increase it by 10dB? Is there the necessary amount of isolation between the main and auxiliary antennas? These are obviously very site-specific questions. One

possible solution may be to change your auxiliary antenna to one with higher gain. This will not only lower your TPO requirement, but could also increase the isolation from your main antenna as well.

The split-level combining method will likely be problematic when trying to increase digital power because there generally isn't that much headroom available in either the IBOC amplifier or the analog transmitter. Assuming there is some amount of headroom available in the current IBOC amplifier, one possible solution would be to add a second (identical) IBOC amplifier with a 3dB hybrid combiner to increase the overall IBOC power. This would obviously necessitate extra space, ac power and air conditioning at the site.



Harris HT/HD+



Broadcast Electronics FMI Series



Nautel NV Series

# Resource Guide

## HD Radio transmitter and antenna manufacturers

### **Armstrong Transmitter**

315-673-1269  
www.armstrongtx.com

### **Bext**

619-239-8462  
www.bext.com

### **Broadcast Technology**

719-336-3902  
www.broadcasttech.com

### **Continental Electronics**

800-733-5011  
www.contelec.com

### **Dielectric**

800-341-9678  
www.dielectric.com

### **ERI-Electronics Research**

812-925-6000  
www.ERInc.com

### **Harris**

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

### **Jampro Antennas**

916-383-1177  
www.jampro.com

### **Larcan**

303-665-8000  
www.larcan.com

### **Nautel**

207-947-8200  
www.nautel.com

### **OMB America**

800-662-4872  
www.omb.com

### **Propagation Systems Inc**

814-472-5540  
www.psibroadcast.com

### **PTEK**

888-889-2958  
www.ptekpower.com

### **QEI**

800-334-9154  
www.qei-broadcast.com

### **Shively Labs**

888-SHIVELY  
www.shively.com

### **SWR**

800-762-7743  
www.swr-rf.com

### **Transcom**

800-441-8454  
www.trcorp.com

I've used the -10dBc levels because it provides the most stringent requirements. It's certainly possible that the amount stations are allowed to increase is going to be less than that, making the solutions to the problems associated with increasing HD Radio power considerably easier. I'm a believer in HD Radio – not only in the efficacy of the technology, but in its future importance to our industry. If we continue to make it available to the radio audience, I believe it will experience a continually increasing level of acceptance. It took FM radio 20 years to catch on after all.

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



## A Perfect Fit

pictured: Modular Standard

### Designed for Quality, Function, and Beauty

We started a revolution in broadcast furniture, and now our designs are the industry standard. They remain in the forefront of high tech engineering and manufacturing design with thousands of satisfied customers worldwide.

Our Master craftsmen, the finest materials, and computerized machines ensure precise cutting and a seamless fit for any studio. Our commitment to service, quality and a fair price have made us the number one broadcast studio furniture manufacturer in the world. Join us.

—Rod Graham, President



## GRAHAM STUDIOS

*Broadcast Furniture...System Integration...Automation*

[www.graham-studios.com](http://www.graham-studios.com) • Toll Free 866.481.6696

# Radio Station

# 2.0

In the summer of 2008 I was asked by Cumulus Media Cincinnati, which owns and operates WRRM (Warm 98), WGRR (Cincinnati's Greatest Hits), WFTK (96 Rock), WNNF (Frequency 94.1) and WOFX (92.5 the Fox) to help plan, design and manage a

complete studio and office facility move. With the purchase of WNNF and WOFX, the cluster had outgrown its downtown facilities and expanding in the existing building was not an option. The area had also been on a steady decline: It was time to make a move.

Karrie Sudbrack, local market manager, Gary Kline, Cumulus V.P. of engineering and IT, and I visited numerous buildings and locations. Would the building be easily accessed from all locations in the city? Would there be adequate parking? Did the facility have the proper security and safety for the employees? Were there clear STL paths to all the transmitter sites from the rooftop or could a small tower be erected on the premises that would accommodate these needs? Would there be enough space to expand or add studios in the future? Within a few short months and after many discussions, a perfect location was chosen.

The studios would be housed in a new and very modern building called Linden Pointe in the Norwood, OH, area. Norwood is a centrally located, up-and-coming neighborhood in the greater Cincinnati metro. It is surrounded by trendy retail shops, restaurants, businesses and night life. The floor chosen for the radio stations had never been occupied: It was a perfect blank canvas.

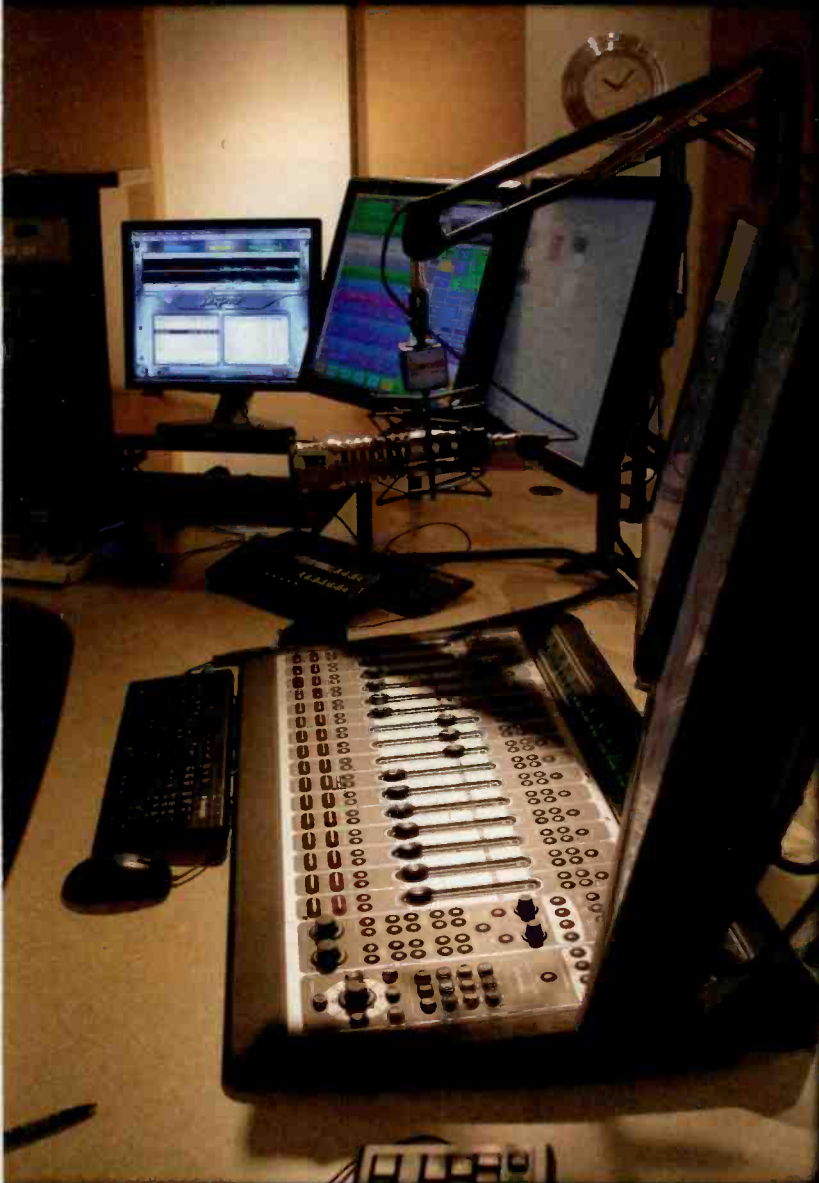
## Getting started

The architectural firm selected for the project was SHP Leading Design. The SHP team worked with us to create an open office. Many radio station operators put their studios in a corner of the building to hide them from the public; our design would put the studios at the forefront of the facility. Two air studios would be placed on either side of the reception area with windows looking in. The rest of the studios and the technical operations center were laid out in the main hallway so clients and visitors would walk through and see them. Floor-to-ceiling windows bordered the entire space allowing a great deal of natural light. Walkways around the entire perimeter ensured the open feel. A giant common area and comfortable lounge areas were put in place to encourage collaboration. Only a few closed-door offices were proposed, but each would have glass doors and be visible from the outside.

## Reduce, reuse, recycle

Building a facility of this size can be an expensive venture. Broadcasters in general have certainly felt the pain

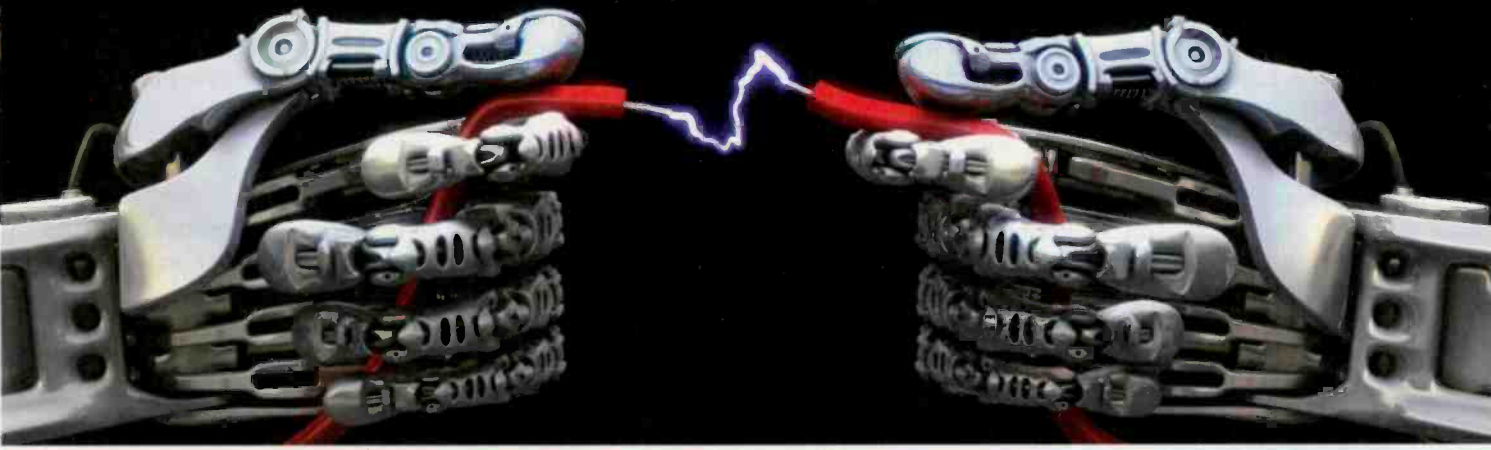
**The Warm 98 air studio has one of two Axia Powerstation systems.**



In a down economy, stations must be resourceful to reduce, reuse and recycle, even when building new facilities.

# 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 works seamlessly with Axia IP-Audio networks or as a stand-alone system.



"The merging of traffic and music logs takes a mere :30 seconds, making it among the easiest I have ever worked with. Once you get used to your adjustable personal color scheme, everything is pretty easy to follow. The best part about this system is the LACK of "dead-air" or "hangups" during automation. PD's will breathe a sigh of relief at this. Another thing that stands out is the absolute ease with which you can build your personal hot keys for each air talent. If you organize your show properly ahead of time and know where you are going, this system will make your show much easier and let you concentrate on \*sounding good\* on the air."

~ Jim Franklin, Program Director  
WBO, Appleton/Oshkosh - Wisconsin



"Finally, an automation system that keeps in mind that not every jock is also a computer whiz. This system is easy to operate from the word go..... yet offers all the bells and whistles that help make your station sound great. The clock builder option makes interfacing with satellite shows very easy. Plus, it has the best voice-tracking capabilities available."

~ Matt Scurry, Operations Manager  
WWFN/WHLZ, Florence - SC



"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

If you're looking for an audio delivery system~  
you owe it to yourself to find out more about Op-X.  
Give us a call or email [info@bgs.cc](mailto:info@bgs.cc)!

**Broadcasters General Store**  
**352-622-7700 • [www.bgs.cc](http://www.bgs.cc)**



# Read what our users say...

## **KPSM/KBUB, Brownwood, TX**

*When asked how things were going with his Xtreme Automation Systems he replied, "Real well! . . . I would definitely recommend it . . . it's trouble free . . . I never hear any complaints . . . I believe in keeping up with the newest & best equipment . . . I've had other automation systems . . . this is our 3rd & I believe in having the best equipment in our stations!"*

Jack Ruth (owner)

## **KIQS, Four Corners Broadcasting, Durango, CO**

*"I love the flexibility (of Xtreme). The switching capability of the bridge is great. I've used (other automation) & Xtreme is much more user-friendly. I have recommended it for cost, capability & support. I always get an answer from your support guys!"*

Ward Holmes, Regional Manager

## **WHFT, Avon Park, FL**

*"The tech support is a huge help. Nothing but good things to say, they've always been great & resolved any issues quickly."*

Tony Scott, Program Director

## **WJQS, Jackson Mississippi**

*"Everything's GREAT with the Xtreme! I'm running 3 Xtremes. I love it because I can run it remotely from home. I would definitely recommend it because it's easy to work with & once you get started you can't break it!"*

Monte Lyons, Operations Manager

## **WMER, Meridian, MS**

*"I love (Xtreme)! I'm a one man show . . . & it does the work of four people! Support is wonderful & very patient! Even when they're busy they always call back right away! I have made several referrals to my friends."*

Mike Glass, owner

## **Woodland Hills, CA Internet Radio**

*"You bet I'd recommend it for the ease of use & it's robust. I learned the software in about 15 mins."*

John Tobin

## **KIKO-FM/KIKO-AM, Claypool, AZ**

*"I rate (Xtreme) at a 10 for ease of use. It's very simple, with limited engineering experience needed. You open the software & it's all self-explanatory."*

*"The manual is great! When I have a basic question I can open it & find the answer."*

*"It's inexpensive & does EVERYTHING! I'm still finding new features!"*

Shelly Harrison, General Manager

and MANY more...

## **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' from Arrakis Systems or buy 'Xtreme-Complete' outright for only \$6,500 from Broadcast Supply Worldwide (BSW).

# WHY PAY A FORTUNE FOR AUTOMATION ?



## Digilink-Xtreme

only \$100 per month

support, training, upgrades

the best automation in Radio, period !

970-461-0730 ext 309

# Radio Station 2.0

of the current economy and we simply could not look at the project with great big budget eyes. We would have to reuse much of the equipment we already had in place and purchase only necessary infrastructure items such as furniture, racks, wire, cable and connectors.

We moved a used 100kW natural gas generator from a former Houston studio facility. We reused our Best Power/Eaton UPS system from the old studio location. We even removed and reused the IAC soundproof doors from the old studios to save thousands of dollars.

For the studios we chose Omnirax's new Innova series line of furniture. David Holland of Omnirax took the time to help us configure and design a perfect fit customized for each room, console and operators' needs. We needed furniture that would be budget-friendly, but also very functional. It had to be sturdy and long lasting and we had custom size and usage requirements. Due to existing tenants on the floors below and above we could not run conduit to our studios and furniture. Instead, all the wire, cabling and electrical would have to enter the room and furniture through wall junction boxes. Omnirax's custom CAD design matched exactly to the plans and layout. Wire and cable were easily distributed throughout the furniture and the punch blocks were easy to access and terminate. We were absolutely amazed with the quality, craftsmanship and

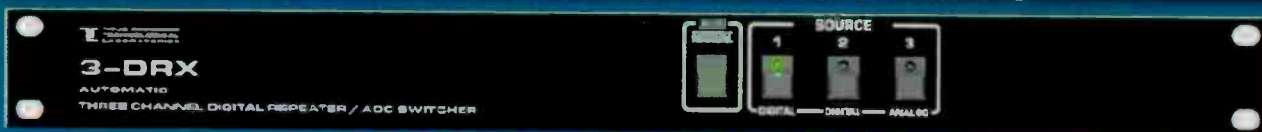


The studio for 96 Rock is almost identical to the Warm 98 studio. WGRR's studio is a mirror image.

extremely easy setup of this furniture line. On the day of delivery, we had a small crew of six engineers. Less than eight hours from the time the truck pulled up we had unpacked, moved and assembled all eight studios. It was definitely an experience to remember.

We decided to purchase two new consoles for the WRRM and WGRR air studios. These studios would be built first and would provide us a way to transition the stations one-by-one into the new facility. Our plan was to move the gently used Wheatstone G6 consoles and Bridge router system for WKTF, WNNF and WOFX. We needed to replace

## DIGITAL AUDIO SWITCHING



### THE LOGICAL WAY 3-DRX

Automatically switches between two AES Digital Audio signals or a stereo analog signal. Analyzes digital signal errors (CRC, bit, framing, etc.) and checks for loss of audio on the digital signal. User programmable.

**TITUS**  
TECHNOLOGICAL  
LABORATORIES

800.806.8851

[WWW.TITUSLABS.COM](http://WWW.TITUSLABS.COM)

## Check Out Our Family Of Consoles... 20 versions available!



MX8R List \$5,200



MX18E List \$8,600

**DYNAMAX** consoles have been a reliable product for small to medium sized Radio Stations since 1991.

- 6 to 18 channel configurations
- 24 or 36 inch wide frames
- 2" or 3" wide module options
- 4 Output Buss (two Stereo and two Mono)
- Metering for all 4 Outputs
- 2 - 4X1 auxiliary inputs standard
- Mic preamp on first two channels



MX8L List \$5,200



MX12L List \$6,300

**SANDIES**

215-547-2570  
[www.sandiesusa.com](http://www.sandiesusa.com)

**DYNAMAX  
MX SERIES**





**The main production room is the largest production studio.**

the aging analog and digital consoles in the production rooms and chose to install used Harris Impulse Digital and Airwave Digital mixers from our surplus equipment. We would also need to replace the aging automation system.

For the two new air studio consoles we chose Axia Element surfaces along with Powerstation. This would be the first Powerstation installation in North America, and we were extremely excited to get our hands on the equipment. 16-fader Element console frames were picked to accommodate all the sources needed in the studios. Axia was chosen for its versatility and Livewire IP audio technology. Additional

AES/EBU and Analog Nodes were placed in the TOC for interfacing with any other source or destination requiring traditional audio wiring. We needed a system that would require the least amount of trunk wiring and be extremely quick to set up and deploy. Axia also provided us an excellent path to grow and build future studios without traditional TDM-based digital routers or analog wiring systems.

For our automation system replacement, we chose Broadcast Software International's OpX. The scalable and redundant multi-tiered architecture of OpX with the integration of Axia's Livewire IP audio drivers were a perfect match. Using high-availability network switches we easily connected all the OpX and Axia systems without wiring a single audio card. Our OpX installation included a master file server, multiple and redundant audio record/playback servers, studio clients and numerous other utilities to quickly import and export audio, create rotator carts and playlists, and easily automate satellite programming. The back-end functions of OpX also let us export artist/title metadata and information to our RBDS systems, streaming encoders, now-playing website banners and future technologies.

For our wiring design we wanted the highest performance and lowest cost wire and cable that could be used for analog audio, AES/EBU digital audio, data, control and even video. We decided to stay away from traditional and expensive multi-pair trunk wiring and instead chose to use inexpensive 650MHz spec CAT-6 cable for all our



**Orban's flagship, now with independent FM and digital radio processing.**

- :: 16-second analog diversity delay works with the latest HD Radio™ Engine implementations and can be applied independently to each 8500 output
- :: ITU412 MPX Power Controller can run regardless of whether diversity delay is enabled
- :: Independently controllable EQ and 5-Band Compression signal paths for the 8500's FM analog and digital radio processing chains
- :: Improved dual-band AGC with window gating rides gain without unnecessarily increasing density



**OPTIMOD-FM  
8500 v2**

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



Contact RAM Broadcast Systems at 800-779-7575  
or visit our website at [www.ramsyscom.com](http://www.ramsyscom.com)

# Radio Station 2.0

connections to and from the TOC and studios. For termination we chose to use Krone K-110 punch blocks, Neutrik audio connectors and L-Com RJ-45, RJ-11 and D-sub connectors. To save money we did not use a wiring integrator and instead designed our own wire distribution and grounding system, ran all the wire, mounted all the blocks and terminated every connection ourselves. We chose overhead data center wire management ladders and kept them below any plenum ceiling spaces for additional cost savings.

To house our TOC equipment we purchased Middle Atlantic WMRK series 48" deep server racks with split rear doors. An ever-increasing amount of broadcast equipment systems are server and computer-based. The racks housed square-hole rails with removable 10-32 cage nuts for mounting traditional equipment. With the square holes we were able to mount all the servers and computers with their proper sliding rail systems. In the past, I have run into so many situations where you unpack the latest, greatest server, go to mount it in a traditional broadcast equipment rack and find that the rails don't work or stick out the back. With the 48" deep racks and adjustable rails we were able to mount each piece of equipment exactly as it was intended.

To make network connections easy, the rear of each rack was outfitted with a 12-port CAT-6 patch panel that terminated

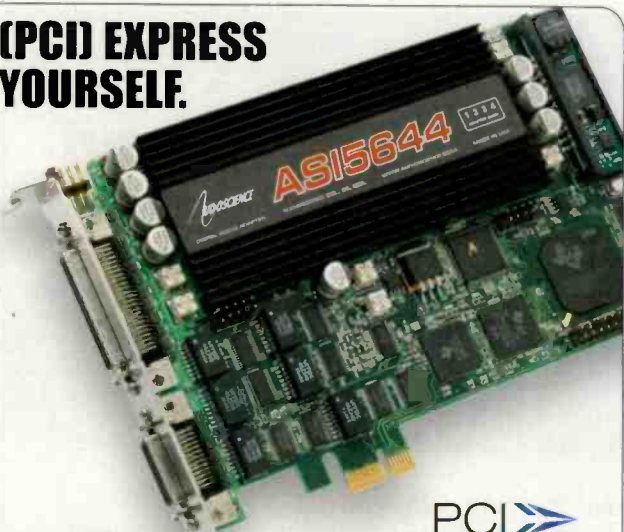


**The second and third production studios are slightly smaller. Carl Cruse, morning show producer for the Fox, is at work.**

to a master patch panel in the network switch rack. Each piece of equipment requiring a network connection could be patched without ever having to home run the wire.

Both the Axia and Wheatstone systems use standard RJ-45 connectors for their analog and AES/EBU audio connections. Crimping hundreds of RJ-45 connectors can take a very long time so instead we purchased inexpensive 100' CAT-6 pre-made cables. With the pre-terminated cables we could cut each one in half, plug the connector end into the equipment and terminate the other end directly onto the punch blocks. The left over cable was

## (PCI) EXPRESS YOURSELF.



PCI  
EXPRESS

**Now, and in the future.** Our speedy ASI5644 linear PCI Express sound card gives you 4 stereo analog and 4 AES/EBU inputs and outputs so you'll never be at a loss for words (or music). Great features, too, like +24dBu analog levels, SoundGuard surge protection and SSX surround sound. And the PCI Express connector guarantees your card will work with today's computers, and tomorrow's. Analog-only (ASI5640) and AES/EBU-only (ASI5641) cards also available. To learn more, call us at +1-302-324-5333 or go to [www.audioscience.com](http://www.audioscience.com).

## 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)



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





**A wire tray exits the TOC feeding individual studios through square cable chase conduits.**

used for cross-connecting the blocks to their destinations. This wiring method saved us a considerable amount of time and money.

### Beyond the studio

For our STLs we needed a way to operate out of each facility simultaneously for a seamless transition from the old location to the new studios. We chose to leave the RF STL systems in place at the old facility and to install a combination of reused Harris Intraplex T1 equipment and new Pulsecomm PCAU audio circuits. The PCAU cards had not been used in Cincinnati before and it took quite a bit of convincing with the local telephone company for

it to understand and agree to the installation.

We installed a Valmont/Pirod 30' guyed tower on the rooftop of the new building to mount the 950MHz and 5.8GHz RF STL antennas. Once the stations began broadcasting at the new facility the systems were taken down and moved from the old facility. We also installed a new 3.8 meter Prodein satellite dish on a non-penetrating rooftop mount for our satellite program delivery. Closely monitoring each one of these separate projects and shopping around for contractors helped achieve our budget goals while getting the highest performance out of each system.

Because of our current economy big budget moves are a thing of the past. We must find new and clever ways to build and improve our facilities. With the right attitude and ability to be creative we're able to make anything possible. The future of our radio broadcasting facilities and our capital projects depends on us as engineers to step up to the task, embrace new cost saving technologies and think outside the box.

Radio station 2.0: It's here.

*Robinson is regional manager of engineering and IT, Midwest-Central Markets, Cumulus Media. He is based in Indianapolis.*

*Editor's note: BSI is owned by Cumulus Broadcasting.*



More photos and equipment list online at [www.RadioMagOnline.com](http://www.RadioMagOnline.com)

## FACILITY FOCUS

### The technology behind Cumulus Cincinnati

#### Broadcast Software International (BSI) Op-X

Op-X is a feature-packed broadcast automation system from BSI. It was designed to work in a multi- or single-station environment. Talent will appreciate its intuitive on-air environment with full-touch screen, simple voice tracking, and easy to use interface. Engineers will enjoy easy installation and maintenance, automatic backup features, a built-in clock builder, and versatility of installation. Station managers will love its relentless up-time and very low cost to maintain. Op-X includes built-in file and audio servers, time bending functions, satellite interface and flexible serial device server allowing you to share audio routers and trigger devices across multiple stations. The intuitive Op-X Studio Client interface is incredibly easy and fast to use, either with Touch Screen, Keyboard & Mouse. From single stations to radio group clusters, Op-X will provide the scalability, reliability and professional sound you expect for your station.



[www.bsiusa.com](http://www.bsiusa.com)  
888-BSI-USA 1

#### Axia PowerStation and Element

PowerStation, Axia's new integrated console engine, combines audio I/O, console power supply, DSP mixing engine and network switch into one easy-to-deploy package. Setup couldn't be easier: connect your studio gear and an Element 2.0 console (as large as 40 faders, with standard CAT-5 cables, name sources with a browser, and you're ready for air. Put PowerStation at the heart of standalone studios or make it part of a larger Axia network; Simple Networking lets you daisy-chain up to four PowerStations for easy multi-studio installation without a separate core switch. And it's built to deliver rock-solid 24/7 reliability, hardened with industrial-grade components and redundant power capabilities. With over 1,500 studios on-air, Axia is the fastest-growing console brand in broadcasting. If you're thinking IP-Audio, think Axia. Because experience counts.



[www.axiaaudio.com](http://www.axiaaudio.com)  
216-241-7225

## Tips, tricks, hints and more

By Chriss Scherer, editor

### Multitaskers are better

The adage using the right tool for the job is a good policy. We all know that a wrench does not make a good hammer, although I'm sure you've tried it. Many of the tools in our tool boxes are unitaskers, but when you're solving a problem, a multitasker solution can provide even more value.

I recently encountered a situation where some creative thinking solved a problem by applying a multitasker. This one involved hanging a vinyl banner.

A couple of bungee cords are usually all you need to attractively hang a vinyl banner, but they are not always the answer. Sometimes it helps to have a rod to attach the banner to. Carrying a 6' (or longer) rod is not very convenient. I looked into alternatives.

I wanted something that could be collapsed. Carrying three or four smaller sections is easier than a single long piece. I also needed it to be rigid, but not excessively heavy. I headed to the home improvement center to look.

I considered a shower rod, but it was too long.



I looked at various curtain rods. Also too long, and too flimsy. Both rods also could be too easily bent. I asked a sales associate for ideas. He suggested pieces of threaded rod with couplers. I also thought of this, but rejected it because the rod could also be easily bent and the threads marred. All these were unitaskers as well.

Then the sales associate offered one more idea: vacuum extension wands. These are the extension tubes for a vacuum cleaner. They are rigid, lightweight, and use a friction fit. Plus, they can still be used to reach the tight spots in the transmitter. Problem solved.

What unique application have you solved with a multitasker?

### Adapt and thrive

The last time you bought a microphone you may have found a threaded adapter inside the mic clip. Did you wonder what it was for? I was once told it was for European mic stands, although I never saw a mic stand in Europe with that smaller thread. What do you do with those threaded adapters? You probably tossed them in a box like I did, thinking they might come in handy sometime.

What is that adapter for anyway? Let's review some thread sizes. Standard mic mounts use a  $5/8$ "-27 thread. The little adapters you have are  $3/8$ "-16 inside. I thought this was an odd size until I recently learned something about camera mounts.



A typical still or consumer video camera has a threaded inset. These are commonly  $1/4$ "-20 threads, but there is another common camera thread size:  $3/8$ "-16.

This all came together for me when I was looking to devise a clamp to attach a portable recorder to a tall mic stand (the bottom section of this stand is about 2" across). I located a clamp for a lighting truss that would work well. I also noted that  $3/8$ "-16 is also commonly used with lighting equipment.

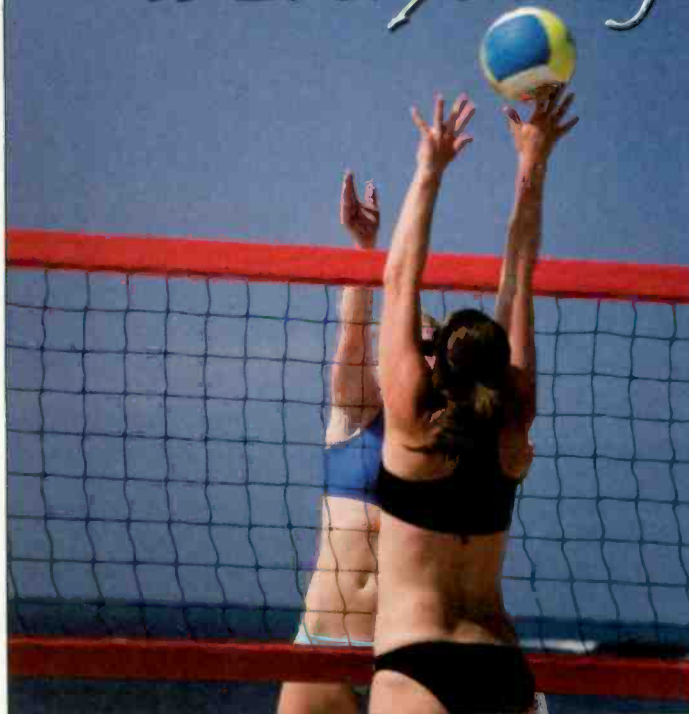
The bolt on the lighting clamp was perfect for the mic thread insert. With another adapter, I can mount the recorder on the bracket, too.

Perhaps now you can find some uses for those  $5/8$ "-27 male to  $3/8$ "-16 female inserts.

Do you have a tech tip?  
Send it to us at  
radio@RadioMagOnline.com

# TIMING

*is Everything*



Don't take a chance with your timing needs. Trust the name broadcasters have counted on for precision master clocks and timing-related products for over 35 years—ESE. Our products accurately synchronize broadcast operations using a choice of GPS, WWV, Modem, Crystal or line frequency for affordable, reliable, perfect time.

Visit [www.ease-web.com](http://www.ease-web.com) to witness world-class timing systems that are designed for easy installation, set-up and operation.

142 Sierra Street  
El Segundo, CA 90245 USA  
Tel: (310) 322-2136  
Fax: (310) 322-8127  
[www.ease-web.com](http://www.ease-web.com)



## PTEK unleashes



- Hot pluggable Power Supplies
- Quick and easy installation in a standard 19" rack
- Single phase 190 to 264 VAC
- Power Factor corrected power supplies (0.98 or Better)



Made in America • 3 year warranty

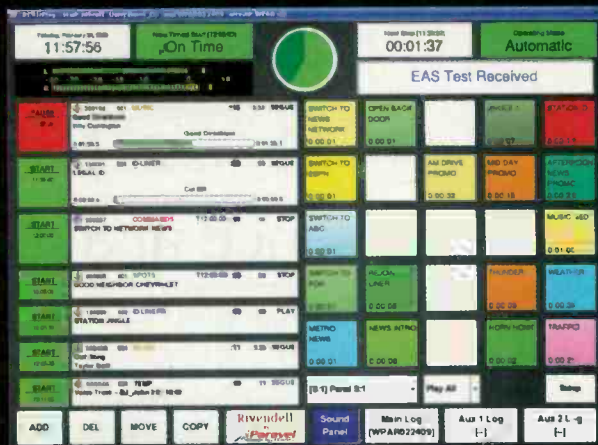
888-889-2958  
[www.ptekpower.com](http://www.ptekpower.com)

FM BROADCAST TRANSMITTERS

# Rivendell

## RADIO AUTOMATION

Don't Sacrifice Performance to Meet Your Budget



Full Software Package and Hardware from \$3,995 per studio  
Includes Rivendell Software, Workstation with ASI card and 1 year of Technical Support



[www.paravelsystems.com](http://www.paravelsystems.com) • (877) 44-PARAVEL • (877) 447-2728



## Airtools Voice Processor 2X

By Marshall Rice

**W**hen I first heard Symetrix was shipping the new Airtools Voice Processor 2X microphone processor I couldn't wait to get a look at it. I'm a big fan of the 528E and I wanted to see how this new digital box would compare. The Voice Processor 2X features two independent channels of very low latency (less than 7ms) digital signal processing plus the ability to store up to 50 nameable presets. The processor can be tailored to each announcer's particular needs and it is easy to switch to their own personalized preset from the front panel. It contains two complete and independent channels of mic processing in 1RU. The 2X has two XLR analog inputs, either mic or line level, two XLR AES inputs, an RJ-45 Ethernet connection, a BNC connector for word clock and an RJ-45 jack for a remote control. The output section of the 2X consists of two XLR analog outputs at line level, or internally switchable to mic level, and two XLR AES outputs.

The 2X is set up by software on a host computer connected with standard CAT-5 cable directly, via an Ethernet switch or through an existing network. If you are not connecting through a network, the IP configuration on both the 2X and the host computer must be set manually, or you could use the default private IP address.

The 2X acquired its IP address from the DHCP server on the network. I started the software, ran

edit, whether to bypass the DSP or mute the channel. The presets are managed, recalled and stored from this menu as well. As you navigate through the screens you quickly realize how versatile and powerful this processor can be.

The processor consists of seven modules including compression, downward expansion, equalization, de-essing, highpass and lowpass filters, and voice symmetry. Choosig edit on the input tab opens the input control. On this screen are the mic or line level settings for each of the two analog inputs, or the digital trim adjustment if the AES inputs are used. Phantom power for condenser mics is chosen here, as well as phase inversion and muting. The two most impressive modules are the high- and low-pass filters, and the EQ. Use the HPF/LPF tab to edit the parameters of the high- and low-pass filters. Each filter features a 12, 24, or 48dB slope if needed, as well as variable frequency and resonance adjustment. The adjustments are represented on a graphical display that shows the frequency response curve for each channel. The high-pass filter works very well for eliminating rumble, wind or HVAC noise in difficult environments. The low-pass filter has the same features as the high-pass filter.

The EQ module is a four-band parametric equalizer that can be switched to either pre or post compressor. The frequency response curve of the EQ is also graphically presented, which makes setting up the EQ much simpler and quicker. The Comp tab opens the compressor screen. On this screen are the standard compressor settings threshold, ratio, attack, release, plus the added control of output gain or makeup gain for the compressor module. Compression and output metering is provided on this screen as well. The DS/EXP tab opens the de-esser and expander screen. The de-esser has a different approach on the 2X. Instead of the usual frequency and threshold adjustments the choices are now disabled, gentle, normal, or aggressive with no variables in between. The expander offers

### Performance at a glance

Two programmable mic channels

Extensive I/O

Compression, EQ, de-essing, downward expander, high- and low-pass filtering

Saves up to 50 presets

Ethernet accessible

Windows setup software

the Connection Wizard and waited for the Wizard to discover the 2X (Figure 1). This took about 30 seconds. A very handy feature of the Connection Wizard is a button that will flash the LED meters on the connected 2X for easy identification in a multiple processor installation. Once you have determined which unit you want to connect to, just click the offline/online button and you are ready to set up the processor.

#### Navigation

I found the setup menus to be very intuitive and easy to navigate. From the main screen you can chose which processing module to enable, disable,

more control with the choices of threshold, ratio, attack, and release. Included on the screen is the metering for the de-esser and the expander.

On the output screen the output levels for both analog and digital are set. The analog range of +4 or -10 is set and voice symmetry can be set to active or inactive. Under the system tab are settings for the AES inputs and outputs. On this screen are settings for sync source, sample rate and word-clock termination. The AES output source for each of the two AES outputs can be chosen from a set of routing matrixes adding to the versatility of this processor. Each channel has an independent test tone generator which, when enabled, applies white noise, pink noise or sine wave to the input, which can be a handy tool for setting levels through the processor and console.

## Airtools

**P** 425-778-7728

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

**E** [sales@symetrixaudio.com](mailto:sales@symetrixaudio.com)

I connected three different mics to the processor: an Electro-Voice RE20, a Shure SM-7 and a Neumann U-87. The AES output was connected to a Klotz digital console and was monitored with Sony 7506 Headphones. Different voices were used, female and male on each of the three mics. I adjusted the processor until both the talent and I were pleased with the sound. The biggest difference I found between the 2X and the 528E is the precise tweaking that can be accomplished with the four-band parametric EQ, and the high- and the low-pass filters. The level of control afforded the engineer on the expander and compressor modules really makes the voice characteristics of the different announcers stand out.

## Real-world analysis

I connected three different mics to the processor:

an Electro-Voice RE20, a Shure SM-7 and a Neumann U-87. The AES output was connected to a Klotz digital console and was monitored with Sony 7506 Headphones. Different voices were used, female and male on each of the three mics. I adjusted the processor until both the talent and I were pleased with the sound. The biggest difference I found between the 2X and the 528E is the precise tweaking that can be accomplished with the four-band parametric EQ, and the high- and the low-pass filters. The level of control afforded the engineer on the expander and compressor modules really makes the voice characteristics of the different announcers stand out.

The talent did not notice any latency issues and the transparency of the compressor was noticed at once. The de-esser never quite sounded right to me especially on the U-87. The choices always seemed a little too much or not enough. So it was disabled. After getting everything set just right the parameters were saved to a preset and the preset was named according to day part. Being able to choose a specific setup for each voice on the air was a big hit and the announcers easily learned to operate the front panel. A remote for this function would be nice. The remote control was not available at the time of this writing.

Security on the 2X can be set on two levels. The front-panel controls can be disabled, and the 2X can be password protected to prevent unauthorized access from the network side. There are no knobs and none of the parameters can be accessed from the front panel of the 2X, all changes must be made through the 2X software. This can be a hassle when changes need to be made quickly, but you don't need those little cages over the controls anymore.



Figure 1

*Rlice is the engineering director at Bonneville International St. Louis Radio Group.*

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.

## For Performance Spaces or Production Places

### Acoustics First®

Materials to Control Sound and Eliminate Noise™




From practice spaces to professional recording studios, we can help you get the materials you need to fit your application and budget. Our products include acoustical foams, fiberglass panels, diffusers, bass and corner traps, vibration control, acoustical wall fabrics, ceiling tiles, modular enclosures and various other acoustical materials.

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

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



## Alesis Pro Track

By Pierre Lonewolf

**I**n my never-ending quest for the better gadget for our staff, I came across the Alesis Pro Track handheld recorder. "So what?" you say. Well, the "what" is that it uses an Apple Ipod as the storage medium.

Since we made the transition from cassette and reel-to-reel here at KOTZ we have used various 600-series Marantz Compact Flash recorders. To add another layer to our ability to gather news, music and elder's stories, we needed a device that could be distributed cheaply with a short learning curve. After reviewing the plethora of available compact digital handheld recorders, I settled on the Alesis unit.

One of our problems here at KOTZ is equipment training. This applies to everything: consoles, announcer headsets for basketball games, you name it. Because a large part of our crew is volunteers, they don't spend the hours an employee has to familiarize themselves with our equipment. But everyone has an Ipod - especially the younger crowd.

### Performance at a glance

- Combo XLR-1/4" inputs
- Phantom power
- Records 16-bit, 44.1kHz or 22kHz stereo
- Onboard stereo condenser mics
- Operates on ac, dc or 4 AAA
- Threaded mounting adapter

#### Kicking the tires

On the lower front of the unit are two recessed audio level knobs (left and right), a menu button and an enter button with a VU meter between them. Right above that is the Ipod docking area under the clear cover. The unit comes with two covers, one for a fifth generation and Classic Ipod, and one for the third generation Nano. The cover of your choice slips over the Ipod to hold it in place, protect it to some degree, but still offer access to its interface.

The left side reveals a row of buttons: open, phantom power on/off, Ipod charge on/off, power on/off and the power input. The open slide-type

switch basically disengages the protective cover. The Ipod can be charged in the unit when the power supply is attached. The Pro Track uses four AAA batteries as a power source.

Returning to the front, the menu button activates a menu on the Ipod. To record, press the enter button to initiate menu commands. The left and right input level control knobs are slightly recessed for protection, which makes them a little hard to turn in a hurry but not too bad.

Right below that are two mic inputs that accept XLR and TRS plugs. Between them is the mini headphone jack. On the right side of the unit is the volume control for the headphones, a limiter off/on switch, a record stereo/mono switch and a lock down connector.

#### User interface

Because of the simple operation of an Ipod, anyone can use the Pro Track. To use the recorder, first turn on the Ipod and then power the Pro Track. It shows a voice memo on the Ipod with a record or cancel choice. Select the record choice and recording begins. Using the built-in mics with the built-in limiter gave acceptable audio for voice, but watch the handling noise if you're moving around. Music was acceptable but using the external mic inputs gave better quality.

Can the user interface be better? I think so, but for the Ipod crowd familiar with the menu system it's no problem. Looking for where the recordings ended up was tedious, but not impossible.

Once a recording was made, I checked the transfer between the Ipod and Adobe Audition. Usually I dread anything when it comes to Apple,



**Combo XLR-TRS connectors make secure connections.**



material is. For voice work, certainly. Music, some but not all, certainly not for studio-level stuff, but that's not what it was intended for. You need to know your source sound and its destination in order to use it well. The physical package could be thinner and a little more sturdy but that is just my taste. In the end I'll say the unit is workable in any station but I would suggest it be used in high school programs and college radio station settings since the end users most likely have an Ipod and you both have an investment it keeping it working and not disappearing. 🎤

## Alesis

**P** 800-5-ALESIS

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

**E** [info@alesis.com](mailto:info@alesis.com)

not because it's a bad product, but because it seems I have to go through convoluted procedures to get what I want. Well not this time. I put the Ipod in my dock and called up the files I test recorded. Wondering how to get files from the player into Audition, I tried drag and drop from Itunes to Audition, and it worked just fine.

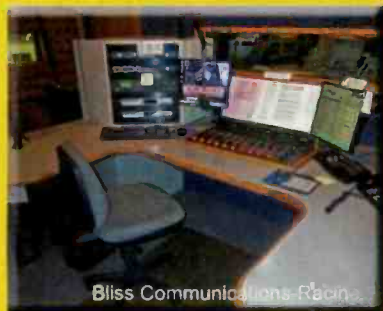
Does it work? Yes it does. Would I use it for professional use? It depends on what the source

*Lonewolf is the chief engineer of KOTZ-AM/FM, Kotzebue, AK.*

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.



Bliss Communications-Racine



Spanish Broadcast Systems-Miami



Spanish Broadcast Systems-Miami

**LET RAM DESIGN A BROADCAST FURNITURE PACKAGE TO FIT YOUR BUDGET.....**

**OVER 40 YEARS EXPERIENCE**

**Specializing in Broadcast Furniture & Integration**



PRN- Concord, N.C



**800.779.7575**

**RAM Broadcast Systems**  
[www.ramsyscom.com](http://www.ramsyscom.com)



Journal Broadcast Group-Milwaukee



PRN- Concord, N.C

# NEW PRODUCTS

www.RadioMagOnline.com

by Erin Shipps, associate editor



## Modular broadcast console Axia Audio

**Element 2.0:** Element 2.0 has features such as voice and headphone processing by Omnia, peak and average metering, one-touch phone recording, automatic mix-minus for every fader, an eight-channel virtual mixer that lets users combine multiple audio streams and control them with a single fader, motorized faders that can assume pre-set levels automatically, and show profiles that instantly recall talent's favorite settings. Element uses avionics-grade switches rated for millions of operations, bullet-proof optical encoders, conductive-plastic faders and a frame made from thick aluminum extrusions. It is available in sizes from two to 40 faders.

216-241-7225; [www.axiaaudio.com](http://www.axiaaudio.com)  
[inquiry@axiaaudio.com](mailto:inquiry@axiaaudio.com)

## FM transmitter PTEK

**Gamma 3000:** The Gamma 3000 features 1,250W power amplifier modules coupled with the hot pluggable power supplies. The power amplifiers and power supplies are independently operated and removable from the front of the unit while it is installed. They are load sharing. The minimal 10W of drive required can be provided with the optional PTEK FM25ES exciter. The Gamma 3000 is simple and quick to install. The system is 4RU weighing 88 pounds.

888-889-2958; [www.ptekpower.com](http://www.ptekpower.com); [sales@ptekpower.com](mailto:sales@ptekpower.com)

## Tri-amplified monitoring system Genelec



**1038CF:** The 1038CF tri-amplified active monitoring system features loudspeaker drivers, slim speaker enclosure (only 9.25"/235mm), dual eight-inch throw bass drivers, multiple power amplifiers and active, low level crossovers. Designed for medium-sized control rooms, the full-range monitor has low-end response down to 30Hz. The system has

a built-in tri-amplifier unit, delivering a total of 420W into two 8" long-throw bass drivers, a 5.12" proprietary Genelec midrange driver and a 1" metal dome tweeter.

508-652-0900; [www.genelecusa.com](http://www.genelecusa.com)  
[genelec.usa@genelec.com](mailto:genelec.usa@genelec.com)

## Web camera Blue Microphones

### Eyeball:

Eyeball is a Web cam with high-quality audio and video, making it perfect for instant messaging and video conferencing. It features Blue's condenser capsule, premium lens with Super HD video, camera-off privacy position with lens pop in and out, and plug-and-play ease of use. Using the same integrated stand and case design as in Blue's Snowflake USB mic, the Eyeball also includes a custom designed monitor adapter making it simple to position it on virtually any laptop or desktop monitor.



818-879-5200; [www.bluemic.com](http://www.bluemic.com)

## Find the mic winner May issue

Congratulations to

### Lloyd Williams

of South Lane TV/Radio,  
Cottage Grove, OR.

His name was drawn from the correct entries for the May issue. He won a Heil Sound PR-30 from Heil Sound.



The mic icon was on the right side of the console meter bridge.



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

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

# NEW PRODUCTS

## Audio processor BW Broadcast



**DSPX-AM:** The DSPX-AM includes a wideband window-gated AGC, a four-band window-gated AGC and a four-band limiter followed by an oversampled distortion-controlled clipper. A separate look-ahead final limiter allows simultaneous full 20kHz processing for digital radio. Like its little brother, the DSPXmini-AM, it also features adjustable low pass filtering to accommodate all AM standards, high frequency equalization, asymmetrical clipping, low frequency transmitter tilt compensation and a tone generator to facilitate easy installation and adjustment. A range of factory presets were designed to produce loud and intelligible sound for talk radio as well as achieve the best fidelity on music formats. The DSPX-AM is a 1RU processor with front-panel LED metering that is also remote controllable via TCP/IP or direct serial connection.

888-866-1671; [www.broadcastwarehouse.com](http://www.broadcastwarehouse.com); [info@broadcastwarehouse.com](mailto:info@broadcastwarehouse.com)

broadcast gear from people you trust



Lowest Prices and Largest Inventory on EVERYTHING For Broadcast

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

## Low-latency sound card platform Digigram

**Lola:** Lola is a low-latency



sound card platform for logging and multi-channel recording. The main features of the first Lola product – the Lola280 – include eight line level inputs, two line level outputs and an optional eight-channel microphone pre-amp in a 1RU rackmount package. The sound card is Digigram's first in a low profile PCI Express bus form factor. It also includes a built-in mixer with automatic gain control (AGC) and a software control panel, allowing inputs to be summed prior to recording and to directly monitor inputs.

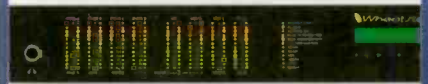
703-875-9100; [www.digigram.com](http://www.digigram.com)  
[input@digigram.com](mailto:input@digigram.com)

## UPGRADES and UPDATES

JK Audio is shipping the Innkeeper LTD hybrid, which was introduced at the 2009 NAB Show. ([www.jkaudio.com](http://www.jkaudio.com))... Dave Scott, former CEO of **Scott Studios**, and **Enco Systems** are teaming to service and support SS32 stations. The venture is **Scott-Enco**. ([ScottEnco.com](http://ScottEnco.com))... Tascam has updated its 202 dual cassette deck to the 202mkV. The new model adds a return to zero function and A-B repeat. ([www.tascam.com](http://www.tascam.com))... **Racktools 3.5**, the free layout and specification software package that includes all products from **Middle Atlantic**, has been updated with new shapes for user-defined components and greater drawing export flexibility. ([www.middleatlantic.com](http://www.middleatlantic.com))

27,832 products in stock at press time!

## It's Time to Connect!



*Wheatstone*

## Wheatstone Wheatnet IP Audio-over-IP Networking made elegantly simple!

- Ethernet-based hardware/software solution
- Digital mix engine with vast DSP power
- 3 I/O routing models (analog, digital, and analog/digital)
- Works with Wheatstone E series control surfaces to provide complete mixing and routing solutions
- Quick and easy setup, on-air in minutes!

88E	Digital Mix Engine	List \$2,995.00
88A	Analog router	List \$2,995.00
88D	Digital router (AES)	List \$2,995.00
88AD	Analog/Digital router	List \$2,995.00

Call BSW For Lowest Price: 800-426-8434

## StudioHub+ Summer Sale!



- Deep discounts on popular, essential items in StudioHub+ line
- Easy CAT-5 wiring ensures quick connection of all StudioHub+ components.
- Powered panels, matchjacks, tie-lines, patch panels and switches to expand connectivity and functionality
- Limited time offer - act fast - don't get burned!

Call BSW For Lowest Price: 800-426-8434

Visit **BSWUSA.com** for spectacular **Summer Sale** on StudioHub+ Products.

broadcast gear from people you trust



**Broadcast Supply Worldwide**

**Knowledgeable Sales Staff**

BSW's sales professionals have decades of real-world broadcast experience to offer expert help with your purchase.

**Antenna positioner  
Towermast**



**Accupoint:** The Accupoint AP-100 is designed to deliver maximum performance for top-of-the-mast antenna positioning. Key features of the AP-100 include more capabilities, improved safety and easier maintenance. Design highlights feature optimized gear and motor ratios for enhanced performance, 100-pound payload capacity and easily accessible adjustable-limit cams for service. Additionally, the AP-100 features an easy to replace breakaway base with lanyard for added safety.

**330-684-4000**  
**towermast.willburt.com**

**FM modulation and  
AF spectrum analyzer  
Sierra Multimedia**

**Microgen TS9080:** The TS9080 FM modulation and AF spectrum analyzer, has been designed for precision monitoring of FM radio broadcasts. Connected to a standard Windows PC via a USB port, its user-friendly interface displays all modulation data on screen for analysis. The enclosure is a custom-designed dual-chamber aluminum extrusion. Audio outputs are provided for high quality headphone or loudspeaker monitoring, with full RBDS decoding available and live off-air data recording. Broadcast data is automatically logged with the included Ilog software. Remote control is possible with simple text file commands allowing the unit to be controlled from third party software applications. Unique to this class of product is a FFT spectrum analyzer.

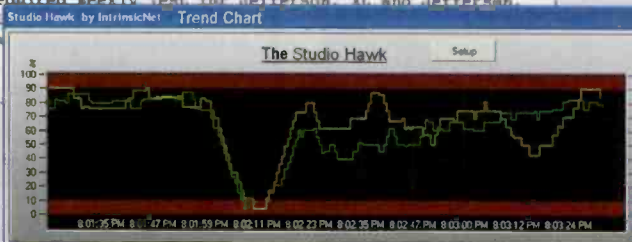
**479-876-7250; www.sierramultimedia.com**  
**ray@sierramultimedia.com**

GALLERY

**THE STUDIO  
HAWK**

EAS Received: 2/19/2009 7:26:12 AM  
[Studio Hawk]public@TheStudioHawk.com  
To: my\_address@mystation.com

A Broadcast station or cable system has issued a  
Required Weekly Test for Jefferson, NJ and Jefferson  
NJ Studio Hawk by IntrinsicNet Trend Chart



**Your Low Cost Solution  
for Monitoring Audio  
and EAS Receivers**

**\$650**

- + Monitor's 8 status channels, 8 analog channels and 8 relays
- + Expandable to 24 channels
- + Emails or text messages of alarms
- + Multiple contacts for each alarm with delays between text messages
- + Receive a daily dead air report pdf by email
- + Receive a Monday morning EAS verification report.
- + Trigger audible alarms via signaling devices
- + Records EAS data (transmitted and received)
- + Filters EAS alerts that can be emailed or sent via text message

**FREE demo at**  
**www.TheStudioHawk.com**

by **intrinsicNet**

\*\*As featured as a Field Report in the April (NAB) Edition of Radio Magazine. Go to [www.RadioMagOnline.com](http://www.RadioMagOnline.com) for more information.

# WEB POWER TOOLS

## Relay Sentinel™ Web-based Three-relay Module

The Relay Sentinel is a reliable way to remotely control equipment over the Internet using a web browser. Each of the three relays can be turned on/off, pulsed or timed latched using the built in web pages.

## Schedule Sentinel™ Web-based Event Scheduler

The Schedule Sentinel is a web-enabled event scheduler that can store and control up to 100 unique events using any available NTP timeserver as a time base. Events may be programmed with Hour/Minutes/Seconds and Day/Month or Day of Week. Configuration and events are programmed using a standard web browser.

## Status Sentinel™ Web-based Three Input Module

The Status Sentinel is a full-featured, Ethernet based data acquisition device with three optically isolated status (digital) inputs. The Status Sentinel may be monitored over the Internet using a web browser.

## Temperature Sentinel™ Web-based Quad Temperature Module

Equipped with one SPDT relay and the ability to communicate with up to four digital temperature sensors and one optically isolated contact closure input. It can be controlled and/or monitored over the Internet.

## WebSwitch Remote Power Switch

The WebSwitch™ is an ideal solution for instant remote reset or remote control over the Internet! WebSwitch™ offers two power outlets, which can be independently controlled using a web browser or web-enabled mobile device.



USA Proud

**BROADCAST**  
**tools**

www.broadcasttools.com

INNOVATIVE PROBLEM SOLVING TOOLS FOR BROADCAST

## Remote Control Power!



### 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 and more!



Includes  
Action  
Sequences!



### DT-232 - Multi Purpose Dial-up Controller

An inexpensive dial-up remote control with amazing capabilities! Gives you DTMF access to 4, programmable relays that respond to any DTMF tone or sequence. Serial data outputs in your, user-defined, format for interfacing to virtually any piece of hardware. Accepts ASCII input from its serial port to generate tones. Includes free setup & control software.



### Silence Sentinel - Silence 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 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)



**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](http://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  
800-446-2295 • 585-924-4560  
[www.ramseybroadcast.com](http://www.ramseybroadcast.com)



## Your #1 Source For Quality Used Radio Broadcast Equipment

View our latest list of  
equipment on-line at:

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

or call and we'll fax it to you.

**All equipment sold with  
a 15 day return guarantee.**

7117 Olivia Rd.  
Baltimore, MD 21220

Ph: 877-722-1031

Fax: 443-596-0212

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

email: [sales@baycountry.com](mailto:sales@baycountry.com)

## GOT ENDEC?

We've Got:

### Endec Printer Paper

OEM thermal paper in 9 meter rolls, 10 to the package. That's 30% more than the standard roll and it fits fine. Less paper changes!

Only \$25.00 for the 10 Pack + shipping



### Replacement Printers

OEM printer modules with step-by-step installation instructions.

Takes just minutes to change!

Only \$57.00 + shipping

### Replacement Power Supplies



Heavy duty high quality switching replacement power supplies.

Keep a spare handy.

Only \$41.95 + shipping

and much, much more

For pricing and details on these and other innovative products for the broadcaster, call us 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



## TORPEY TIME... The Good Time People!

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

Call Toll Free:  
**1.800.387.6141**  
North America Only

**CLK-26**

**STW-5**

**CLK-20C**

**GPS-1**

**CLK-50**

**Dixon Systems**

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

Torpey Time Product line now proudly manufactured by Dixon Systems Inc.

## Transcom Corporation

Fine Used AM & FM Transmitters

Authorized Representatives for all major equipment manufacturers

### USED FM TRANSMITTERS

1 KW	2009	Crown FM1000E (demo), solid state
2 KW	2004	Crown FM2000E, solid state
5 KW	1991	Harris HT5
7+HD	2005	Harris Z16HDC IBDC, solid state
14+5 KW	2005	BE Fmi1405 (IBOC) HD, solid state
20 KW	2005	BE FM20S, solid state
20 KW	1985	Harris FM20K
21.5 KW	1989	Continental 816R-2B
27.5 KW	1984	Continental 816R-4B
30 KW	1994	Harris HT30CD
30 KW	2002	Harris HT30CD
35 KW	2003	Harris HT35CD
50 KW	1982	Harris Combiner w/ auto exciter-transmitter switcher

### USED AM TRANSMITTERS

5 KW	1982	Harris MW5A
5 KW	1987	Harris MW5B
5 KW	1987	Harris SX5A, solid state
10 KW	1985	Continental 316F
10 KW	1985	Harris MW10B
12 KW	2000	Nautel XL12, solid state

### EXCITERS

\*New\* 30 W synthesized exciters  
Used Harris 2nd Generation Digit Exciter  
Used Nautel NE-50 exciter

### NEW TV TRANSMITTERS

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

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

**PHASETEK, INC.**

PHASETEK'S manufacturing facility and components expertise are available to design and fabricate any type of inductor or special R.F. component.

Our experienced staff of engineers and production personnel are dedicated to provide the broadcast industry the highest quality custom designed phasing equipment.



CUSTOM PHASOR INSTALLATION

RADIO STATION WXYT, DETROIT, MICHIGAN  
9 TOWER, 50 KW DA-2 PHASOR SYSTEM

**PHASETEK, INC.**

550 CALIFORNIA RD, UNIT 11  
QUAKERTOWN PA 18951

PHONE: 215-536-6648 FAX: 215-536-7180  
TOLL-FREE: 800-742-7383



**Transmitting & Audio Tubes  
Semiconductors**

Taylor Motorola  
Eimac Toshiba  
Amperex Thompson  
MA/Com Mitsubishi

**Immediate  
Shipment  
from Stock**

• Se Habla Español • We Export

760-744-0700 • 800-737-2787

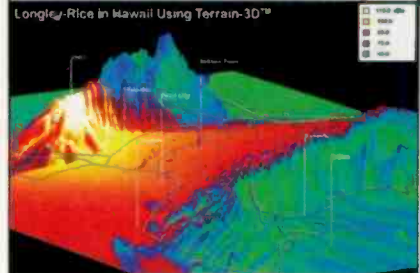
Fax: 760-744-1943

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

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



**Broadcast Engineering  
Propagation Software**



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™



[www.v-soft.com](http://www.v-soft.com) 800 743-3684

Coming in the August issue of

**Radio**

THE RADIO TECHNOLOGY LEADER

- Streaming Audio Update  
*A tech overview to get started*
- Facility Showcase  
*WILQ rebuilds after vandalism*
- Managing Technology  
*New options in back-up power*
- New Products  
*All the new stuff*
- Field Reports  
*Microgen TS 9080 & JBL Control 2P*

And don't forget to vote!

Advancement in Radio Technology



*nott ltd*

3801 La Plata Hwy  
Farmington, NM 87401  
Phone 505-327-5646  
Fax 505-325-1142

Folded Unipole



Antennas

Detuning  
Systems



Gilstat  
Lightning  
Dissipation  
Systems



Nello Towers  
Radian/Rohn  
Towers

[www.nottltd.com](http://www.nottltd.com)  
[info@nottltd.com](mailto:info@nottltd.com)

# CLASSIFIEDS

## FOR SALE



Running to the site?  
Time to Remote the site!



Stackley Devices, LLC  
(609) 647-9677

[www.remote-outlet.com](http://www.remote-outlet.com)



## Acoustics First®

Toll-Free  
Number: **888-765-2900**

Materials to Control Sound  
and Eliminate Noise™  
<http://www.acousticsfirst.com>

Advancement in Radio Technology



A W A R D S

Coming in August

## Get your own copy!

Each month, the Radio  
Technology Leader brings  
you the latest must-read  
information:

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



THE RADIO TECHNOLOGY LEADER

To start your own **FREE**  
subscription, go to  
[subscribe.RadioMagOnline.com?tc=nn6007](http://subscribe.RadioMagOnline.com?tc=nn6007)

and complete the  
online form **TODAY!**

# Radio®

THE RADIO TECHNOLOGY LEADER

[www.RadioMagOnline.com](http://www.RadioMagOnline.com) • [radio@penton.com](mailto:radio@penton.com)

Editor – Chriss Scherer, CPBE CBNT, [chriss.scherer@penton.com](mailto:chriss.scherer@penton.com)

Technical Editor, RF – John Battison, P.E., [batcom@ohio.net](mailto:batcom@ohio.net)

Associate Editor – Erin Shippis, [erin.shippis@penton.com](mailto:erin.shippis@penton.com)

Senior Art Director – Michael J. Knust, [mike.knust@penton.com](mailto:mike.knust@penton.com)

Art Director – Robin Metheny, [robin.metheny@penton.com](mailto:robin.metheny@penton.com)

Senior Digital Content Specialist – Brad Erpelding, [brad.erpelding@penton.com](mailto:brad.erpelding@penton.com)

Digital Content Specialist – Chris Flenker, [chris.flenker@penton.com](mailto:chris.flenker@penton.com)

### Technical Consultants

Harry C. Martin, Legal

Kevin McNamara, CNE, Computers and Networks

Mark Krieger, CBT, IBCO and Contract Engineering

Russ Berger, Broadcast Acoustics

Donald L. Morkley, P.E., Transmission Facilities

### Contributors

Doug Irwin, CPBE AMD, Chris Wyal, CBRE; John Landry, CSRE

Group Publisher – Wayne Madden, [wayne.madden@penton.com](mailto:wayne.madden@penton.com)

Associate Publisher – Steven Bell, [steven.bell@penton.com](mailto:steven.bell@penton.com)

Marketing Director – Kirby Asplund, [kirby.asplund@penton.com](mailto:kirby.asplund@penton.com)

Marketing Coordinator – Crystal Shires, [crystal.shires@penton.com](mailto:crystal.shires@penton.com)

Vice President of Production – Lisa Parks, [lisa.parks@penton.com](mailto:lisa.parks@penton.com)

Senior Director of Production – Curt Pordes, [curt.pordes@penton.com](mailto:curt.pordes@penton.com)

Group Production Mgr. – Melissa Langstaff, [melissa.langstaff@penton.com](mailto:melissa.langstaff@penton.com)

Production Coordinator – Steven Kapp, [steven.kapp@penton.com](mailto:steven.kapp@penton.com)

Client Services Coordinator – Jesse West, [jesse.west@penton.com](mailto:jesse.west@penton.com)

Classified Ad Coordinator – Sarah Maxey, [sarah.maxey@penton.com](mailto:sarah.maxey@penton.com)

VP Audience Development – Geoff Smith, [geoff.smith@penton.com](mailto:geoff.smith@penton.com)


Audience Marketing Director – Barbara Kummer, [barbara.kummer@penton.com](mailto:barbara.kummer@penton.com)

Audience Marketing Manager – Sonja Cheadle, [sonja.cheadle@penton.com](mailto:sonja.cheadle@penton.com)

### MEMBER ORGANIZATIONS

Sustaining Member of:

• Audio Engineering Society

• Society of Broadcast Engineers  **missouri association of publications**

Member: American Business Media, The Missouri Association of Publishers

### A PENTON MEDIA PUBLICATION



Penton Media, Inc.  
249 West 17th Street  
New York, NY 10011

Chief Executive Officer – Sharon Rowlands, [sharon.rowlands@penton.com](mailto:sharon.rowlands@penton.com)

**SUBSCRIPTIONS:** Free and controlled circulation to qualified subscribers. Non-qualified persons may subscribe at the following rates (Prices subject to change): USA and Canada, 1 year, \$66.00, 2 years, \$116.00, 3 years, \$165.00. Outside the USA and Canada, 1 year, \$83.00, 2 years, \$149.00, 3 years, \$215.00 surface mail (1 year, \$127.00, 2 years, \$237.00, 3 years, \$347.00 airmail delivery). For subscriber services or to order single copies, write to Radio magazine, 2104 Harvell Circle, Bellevue, NE 68005 USA; call 866-505-7173 or 402-505-7173; or visit [RadioMagOnline.com](http://RadioMagOnline.com).

**POSTMASTER:** Send address changes to Radio, P.O. Box 2100, Skokie, IL 60076-7800 USA.

**ARCHIVES & MICROFORM:** This magazine is available for research and retrieval of selected archived articles from leading electronic databases and online search services, including Factiva, LexisNexis, and Proquest. For microform availability, contact National Archive Publishing Company at 800-521-0600 or 734-761-4700, or search the Serials in Microform listings at [napubco.com](http://napubco.com).

**REPRINTS:** Contact FosteReprints to purchase quality custom reprints or e-reprints of articles appearing in this publication at 866-436-8366 (219-879-8366 outside the U.S. and Canada). Instant reprints and permissions may be purchased directly from our website; look for the RSiCopyright tag appended to the end of each article.

**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).

**PRIVACY POLICY:** Your privacy is a priority to us. For a detailed policy statement about privacy and information dissemination practices related to Penton Media, Inc. products, please visit our website at [penton.com](http://penton.com).

**EDITORIAL and BUSINESS OFFICE:** Penton Media, Inc. 9800 Metcalf, Overland Park, KS, 66212; 913-341-1300; [RadioMagOnline.com](http://RadioMagOnline.com); [radio@penton.com](mailto:radio@penton.com).

Copyright 2008, Penton Media, Inc. All Rights Reserved.

### List Rental Services - Curvin Lovejoy

Curvin Lovejoy  
Phone: 845-732-7262  
Fax: 845-620-1885  
[curvin.lovejoy@walterkarl.infousa.com](mailto:curvin.lovejoy@walterkarl.infousa.com)

### Editorial Reprints

Penton Reprints  
Phone: 877-763-2303  
Website: [www.pentonreprints.com](http://www.pentonreprints.com)  
E-mail: [diane.mason@penton.com](mailto:diane.mason@penton.com)



# Sales Offices

## Associate Publisher Steven Bell

Phone: 913-967-7221; Fax: 913-514-6848  
E-mail: steven.bell@penton.com

## Europe/UK Richard Woolley

Phone: +44 1295 278 407  
Fax: +44 1295 278 408  
E-mail: richardwoolley@btclick.com

## Classified Advertising Julie Dahlstrom

Phone: 312-840-8436; Fax: 312-595-1983  
E-mail: julie.dahlstrom@penton.com

## Online Sales & Marketing Angie Gates

Phone: 913-967-7516; Fax: 913-514-7516  
E-mail: angie.gates@penton.com

# Contributor Pro-file

Meet the professionals who write  
for *Radio* magazine.  
This month:  
Field Report, page 30



**Marshall Rice**  
Engineering  
Director  
Bonneville  
International St.  
Louis Radio Group

Rice began his career in 1979 at the student radio station KMNR-FM at the

University of Missouri-Rolla. He was an announcer and chief engineer at small market stations in the 80s before he realized what side of the mic he belonged on. He moved to St. Louis in 1988 where he met his wife at a live broadcast. He joined Bonneville International in 2000. He is also a Christmas enthusiast and spends his spare time designing and building decorations for his family's home.



Written by radio professionals  
Written for radio professionals

Radio, Volume 15, Number 7, ISSN 1542-0620 is published monthly and mailed free to qualified recipients by Penton Media, Inc. 9800 Metcalf, Overland Park, KS 66212-2216 (www.penton.com). Canadian Post Publications Mail Agreement No. 40612608. Canada return address: Bleuchip International, P.O. Box 25542, London, ON N6C 6B2. Additional resources, including subscription request forms and an editorial calendar are available online at www.RadioMagOnline.com. To order single copies call 866-505-7173 or 402-505-7173.

# ADVERTISER INDEX

	Page Number	Advertiser Hotline	Advertiser Website
Acoustics First	31	888-765-2900	www.acousticsfirst.com
Arrakis Systems	22-23, 43	970-224-2248	www.arrakis-systems.com
AudioScience	26	302-324-5333	www.audioscience.com
Bay Country Broadcast Equipment	38	877-722-1031	www.baycountry.com
Broadcast Software International	21, 27	888-BSIUSA1	www.bsiusa.com
Broadcast Supply Worldwide	35	800-426-8434	www.bswusa.com
Broadcast Tools	37	360-854-9559	www.broadcasttools.com
Circuitwerkes	37	352-335-6555	www.circuitwerkes.com
Coaxial Dynamics	26	440-243-1100	www.coaxial.com
Comrex	9	978-784-1717	www.comrex.com
Continental Electronics	15	800-733-5011	www.contelec.com
Dixon Systems	38	416-261-3773	www.dixonsystems.com
DM Engineering	38	800-249-0487	www.dmengineering.com
Enco Systems	1	800-ENCO-SYS	www.enco.com
ESE	29	310-322-2136	www.eseweb.com
Graham Studios	19	866-481-6696	www.graham-studios.com
Logitek	3	800-231-5870	www.logitekaudio.com
Mooretronix	37	800-300-0733	www.mooretronix.com
Nautel Electronics	7	902-823-2233	www.nautel.com
Nott Ltd.	39	505-327-5546	www.nottltd.com
OMB America	13	305-477-0973	www.omb.com
Paravel Systems	29	877-447-2728	www.paravelsystems.com
Phasetek	39	800-742-7383	
PTEK	29	888-889-2958	www.ptekpower.com
RAM Broadcast Systems	25, 33	800-779-7575	www.ramsyscom.com
Ramsey Electronics	38	800-446-2295	www.ramseybroadcast.com
RF Parts	39	800-737-2787	www.rfparts.com
RF Specialties	15		www.rfspec.com
Sandies USA	24	215-547-2570	www.sandiesusa.com
SCMS, Inc.	11	800-438-6040	www.scmsinc.com
Telos Systems	27	216-241-7225	www.telos-systems.com
The Studio Hawk	36		www.thestudiohawk.com
TieLine Technology	5	888-211-6989	www.tieline.com
Titus Technological Labs	24	800-806-8851	www.tituslabs.com
Transcom Corp.	38	800-441-8545	www.fmamtv.com
V-Soft Communications	39	800-743-3684	www.vsoft.com
Wheatstone	2, 44	252-638-7000	www.wheatstone.com
Yellowtec	17	49-2173-957-315	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 Shipp, associate editor

## Do you remember?

If there is one thing that hasn't changed over the years, it's our need, as consumers, for more power. New portable devices are sucking battery power like never before and we're always looking for more. Even in this Jan. 23, 1926 advertisement from *The Literary Digest* for Balkite Radio Power Units, the theme was more power. "Unfailing radio power from the light socket," the ad touts. All Balkite Radio Power Units were "permanent pieces of equipment, entirely noiseless, had no bulbs, nothing to break, replace or get out of order." Looking to the future, it sure would be nice to have unfailing power that truly lasted. With the demand for more and more portable gadgets, we shall soon see what capabilities lie in battery power.



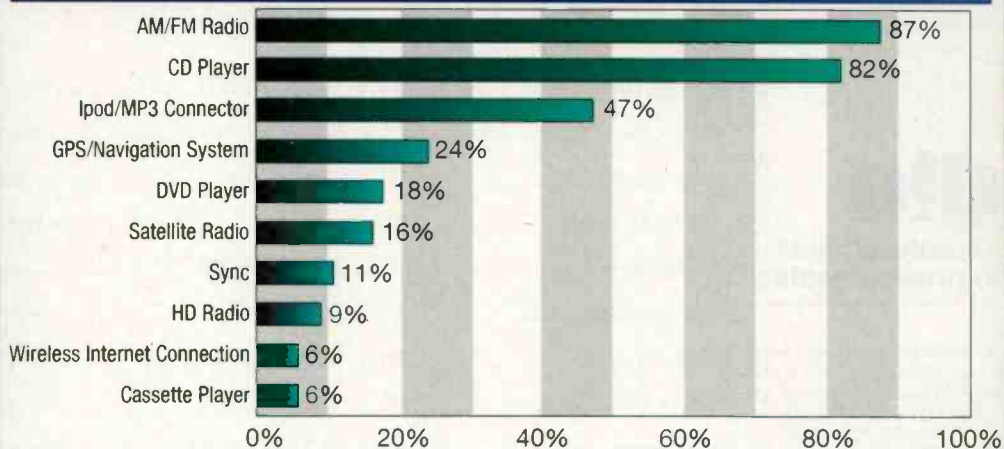
## Sample and Hold Domestic cars need to market best features

**W**ith both General Motors and Chrysler in bankruptcy court, a Jacob's Media survey of more than 21,000 rock radio listeners from around the U.S. says many potential buyers will strongly consider an American car or truck this year. Of the 12 percent indicating they will purchase (or lease) a new vehicle in 2009, nearly half (46 percent) say they always buy a domestic product, and one-fifth (18 percent)

say they are strongly considering an American car or truck, even though they typically opt for a foreign brand. GM, Ford and Chrysler can ensure these buyers will purchase one of their vehicles by marketing the most desirable features and options, i.e. iPod connections, which stands high above options like satellite radio, GPS and HD Radio. Here's how the marketable options stack up.

### Desirable Features - Next Car

Based on "Very Important" Responses\*



\*Of those planning to buy/lease a new car in 2009 - 12% of the sample

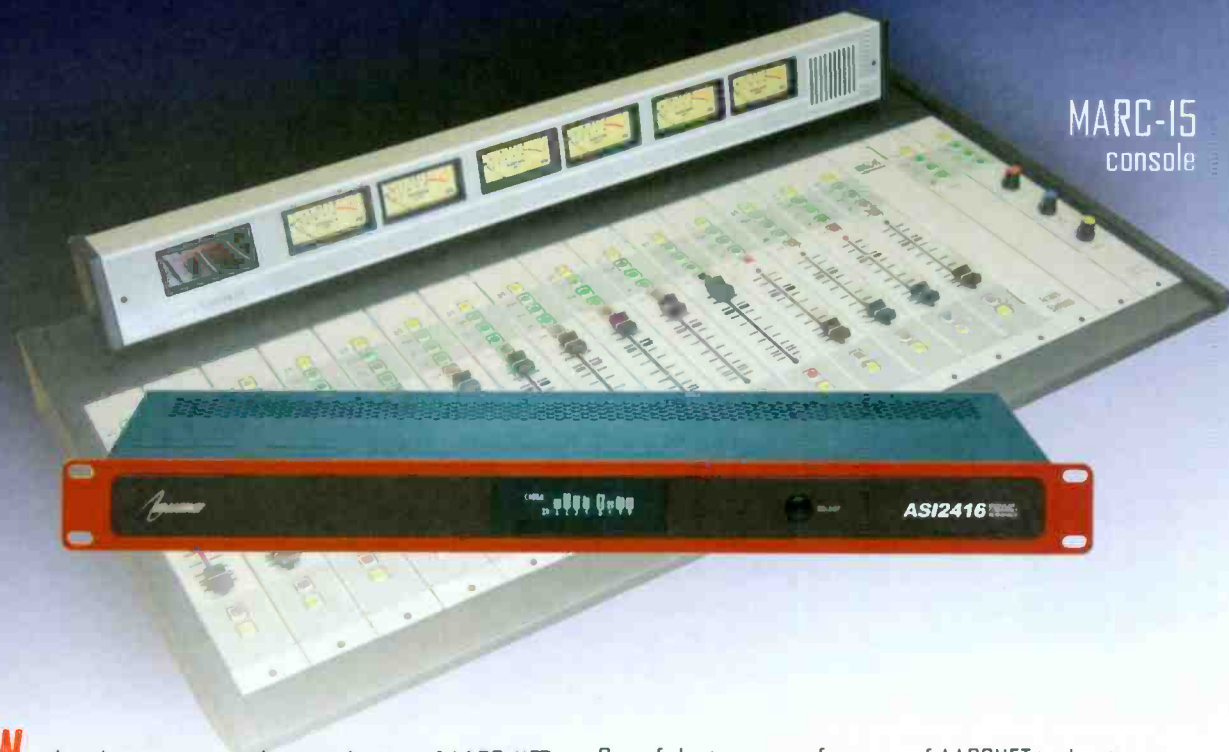
Source: Jacobs Media Tech Survey V.

# NEW

audio networking from **ARRAKIS**

# MEM

## ARRAKIS AARC-NET AUDIO NETWORKING MADE SIMPLE



MARC-15  
console

**NEW**... Arrakis announces the introduction of AARC-NET, (Arrakis.Advanced.Radio.Console.Network). It is a seamless integration of Arrakis consoles & automation, 'Cobranet' audio networking products, and Arrakis software. Cobranet is THE world standard in audio networking with over 1,000,000 nodes installed. All Cobranet products from different manufacturers work together to form a powerful audio network. The core of the AARC-NET network are AudioScience Cobranet products. Plug-in compatible with the Arrakis ARC & MARC consoles, installation & setup takes minutes. No more punchblocks or multipair cables. Changing a wiring connection is a simple software choice. AARC-NET is fast, easy, and inexpensive.

One of the important features of AARCNET is that it integrates standard analog and digital consoles onto the network instead of using expensive network based digital mix engines. You can therefore integrate consoles that you already own into the system. This makes repair and maintenance easy, and your console isn't dead when the network crashes. Most importantly, AARC-NET is world standard Cobranet audio networking, not a custom one-of-a-kind network.

**Inexpensive**... a standard AARC-NET system is 1/3rd to 1/2 the price of competing systems, thus bringing networked audio within the reach of the entire radio market. A current MARC-15-12 console with 8x8 network is under \$7,500 !!!

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

970.461.0730

# SELF SUFFICIENT BUT CAN PLAY WELL WITH OTHERS



## AUDIOARTS D-75

DIGITAL · NETWORKABLE · AFFORDABLE · INCREDIBLE



It's no secret that Wheatstone is the #1 name in radio consoles and networking, known for top quality performance and ruggedness. That heritage is a parent in every aspect

of the Audioarts D-75 Digital Audio Consoles.

Fully modular plug-in construction. Built-in mic preamps. Analog or digital inputs wherever you want them. Optional dual phone mix-minus module. Four stereo output buses. Built to last and last. Hinged meter bridge for easy access to wiring and logic programming without having to crawl under the furniture.

Need to network your plant? Easy! Install Wheatstone or Audioarts network I/O frames and a switch in your TOC/rack room. Install D-75N consoles in your studios. The D-75N includes six networked input channel modules that access any source from anywhere in the network, plus two locally connected sources that appear on your consoles and on your network. And the D-75N's four output buses are available on the network as well.

When we conceived the D-75, the idea was to make it digital, affordable and networkable. And it's incredible just how fine it turned out. We're proud of the D-75 and it's ability to play well with others. We think you're going to find it pretty incredible, too.

### D-75 major market features:

- Fully modular
- 18 slot frame with 12 input modules
- 26 slot frame with 20 input modules
- Input channel A/B source select
- Optional dual phone mix-minus module
- Optional line selector and control modules
- Opto-isolated control ports on every input module
- Four stereo output buses: PGM, AUD, AUX, UTIL
- Clock and timer
- External rackmount power supply



Flexible. Affordable. Built To Last.

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