Radio®
THE RADIO TECHNOLOGY LEADER
January 2010
RadioMagOnline.com

Higher-Power IBOC

Planning starts now

FACILITY SHOWCASE
Kent State's WKSU

FIELD REPORT
Neogroupe Neoscreener

A Penton Media Publication

Make the Switch to Presenter Now...
We'll Convert Your Audio and Data For Free!
Presenter, The Ultimate 'Live & Local' Studio System.
ENCO
When Playing Audio Really Matters.
(800) ENCO-SYS

www.enco.com

IT IS THE MOST MUSICAL OF ALL PROCESSORS...

VORSIS GOES TO 11!

It's been said that D-Minor is the saddest of all keys. But to truly understand that, you need to be able to HEAR D-Minor. That's where Vorsis comes in. Because, you see, it's also been said that Vorsis is the most musical of all processors - this coming from engineers around the world. No matter which Vorsis processor you choose, you can be assured your legions of fans out there will be getting the cleanest, most detailed sound you can deliver. And, as a bonus, you'll save money doing it!

Using Vorsis is as easy as owning it. Just pick a preset from the many that cover just about every format there is, and you're off! Want to tweak things to get your own signature sound dialed in? Vorsis' toolset is unparalleled, offering you deep control over every nuance of your sound.

There are a ton of technical particulars that we're sure you'll want to read about, so we've made it easy to find them on our website. Grab 'em. Read 'em. And give us a call. We'll be happy to get you set up before you find yourself residing in the "where are they now?" file.

WHEATSTONE VORSIS

It's Time YOU Won The Ratings War.™

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

©2009 Logitek Electronic Systems, Inc.

www.RadioMagOnline.com
Radio
THE RADIO TECHNOLOGY LEADER

CONTENTS

20

Features

14 Trends in Technology: Power increase
by Doug Irwin
Implementing higher-powered IBOC is no trivial task

20 Facility Showcase: Kent State's WKSU
by Ron Bartlebaugh
An IBOC dream 19 years in the making

28 Tech Tips
by Chriss Scherer
Tips, tricks, hints and more

10

Columns

8 Viewpoint
by Chriss Scherer
Technical support at the FCC...finally

10 RF Engineering
by Jeremy Ruck
Grounding standards for broadcast

12 FCC Update
by Harry C. Martin
LPFM relief bill nears passage

30

Departments

6 Online
at www.RadioMagOnline.com

30 Field Report: Neogroupe Neoscreener
by Jeff Smith

32 New Products
by Erin Shipps

44 Classifieds

45 Contributor Pro-File
Meet Ron Bartlebaugh

46 Sign Off
by Erin Shipps
Thoughts on Audio over IP and pics from "Pirate Radio"

ON THE COVER

Although still in the FCC's hands, an IBOC power increase seems imminent. What can you do to prepare for the change? Start on page 14 to find the answers. 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 STLs, backup audio links, IP audio distribution, STL confidence monitoring, temporary remotes, multicasting and multiple unicasting links
- The 'only' low-cost IP codec with a front panel LCD screen, dialing keypad and navigation buttons.
- 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

Contact Tieline or your favorite Dealer today and try it now

2009 PICK HIT Radio

COOL STUFF AWARD Radio World 2009

Tieline®
www.tieline.com

www.tieline.com/bridge-it

800-950-0750

CONTENTS ONLINE

Currents Online

Selected headlines from the past month.

Senate Bill Seeks Greater FCC Technical Resources

Sen. Olympia Snowe introduced the action to modify the Communications Act of 1934.

CPR Taps Day Sequerra and DTS-Neural for Yo-Yo Ma Surround Broadcast

Day Sequerra, DTS-Neural, Neumann and other equipment are part of the equipment lineup.

Omnia Releases More Free Presets

The presets are created by Omnia users and the Omnia support team.

RAB, NAB Create Expanded Working Relationship

Part of the agreement: The Fall Radio Show will be a joint production of the RAB and the NAB.

Local Community Radio Act Clears House of Representatives

If enacted, the bill will allow new low-power commercial stations to apply for licenses.

SBE Taps Madison, WI, for 2010 National Meeting

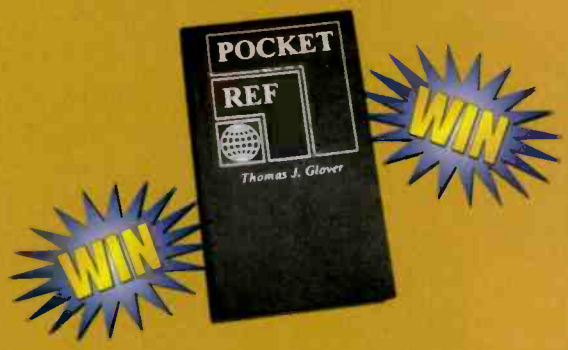
The Society of Broadcast Engineers national meeting will be held during the Wisconsin Broadcasters Association Broadcasters Clinic Oct. 26-28, 2010.

NAB Hires Keenom for State Association Outreach

Sue Keenom joins the NAB as senior vice president. She was previously with the International Women's Forum Leadership Foundation.

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 copy of the *Pocket Ref* from *Radio* magazine.



Enter by Feb. 10.
Send your entry to
radio@penton.com
Include your name, job title, company name, mailing address and phone number.

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

Site Features

Radio magazine Podcasts To Go

The Radio Currents Weekly podcast brings the news headlines to you to take on the road. Also look for special podcasts with interviews and more.

Newsletters Keep You Informed

The Radio Currents Online Weekly e-mail newsletter has all the week's news, but you can also subscribe to the twice-monthly Digital Radio Update and twice-monthly New Products Extra. Subscribe today.

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/RadioMagazine
- twitter.com/Radiomagazine

Industry Events

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

Able to leap tall buildings?

No distance or line-of-sight restriction makes **Starlink SL9003T1** the ideal choice for STL/TSL and intercity links.

Starlink T1's bidirectional high capacity significantly reduces communications costs compared to discrete audio, telephone and data circuits.

And **Starlink's** uncompressed digital audio will stand out above your competition.

STL over any distance or terrain...
...Moseley Starlink T1

- HD Radio™ and Multicasting
- Transmitter remote control
- RBDS data
- Telephone extension
- IP-based equipment control
- Internet and e-mail connection

Call the digital STL experts today.

Dave Chancey 805.968.9621

Bill Gould 978.373.6303

www.moseleysb.com

Moseley

CSCHERER@RADIOMAGONLINE.COM

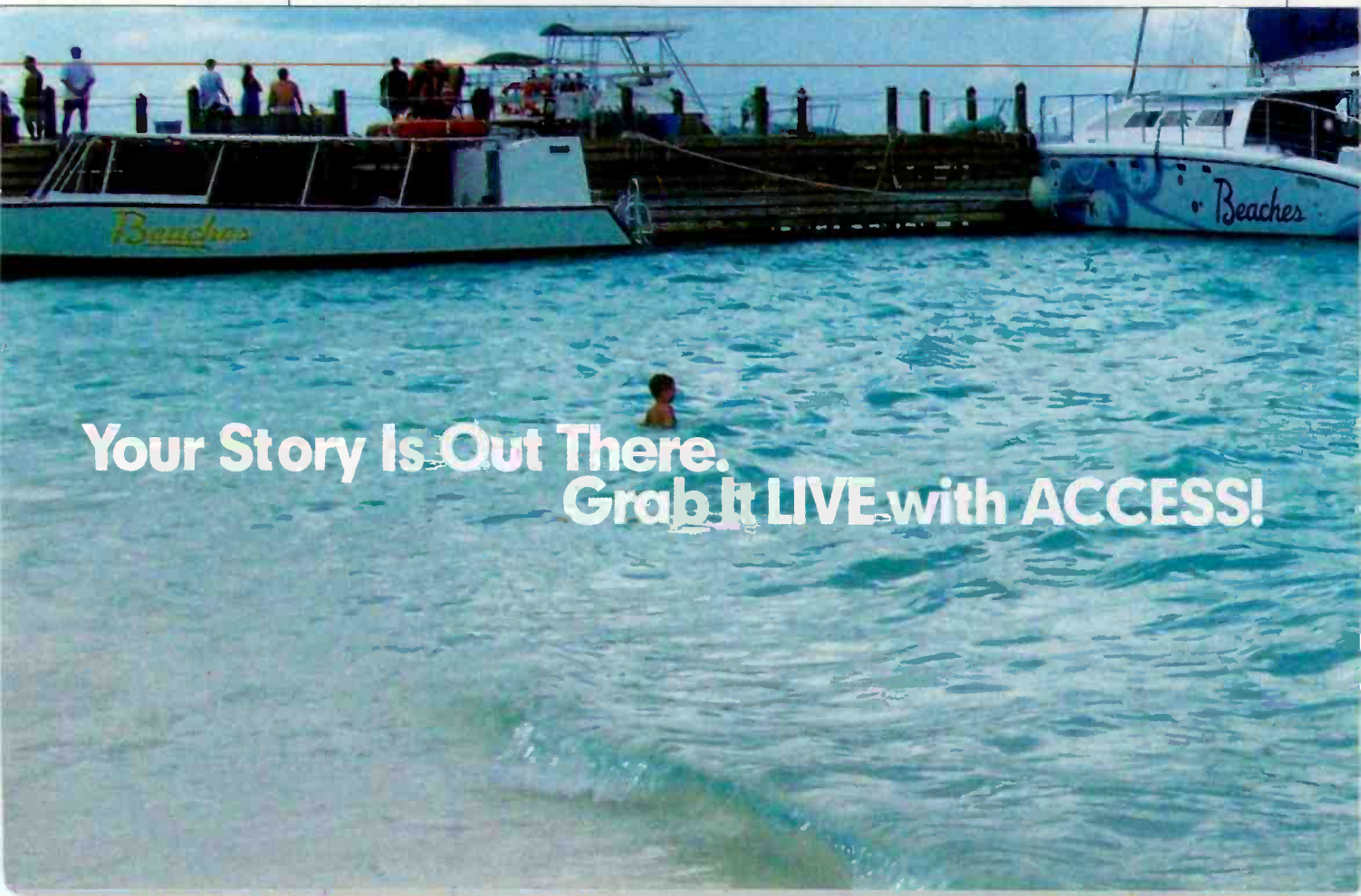
Technical support at the FCC...finally

Have you often wondered how the FCC makes its rules? Much of what the agency covers concerns technical issues, yet the commissioners are not technical people; they are lawyers. They of course have staffs to advise them on issues, and the various bureaus have a range of talent to cover legal and technical aspects. But the commissioners rely on their staffs for much of their decision-making.

So how does a non-technical person make a technical decision? That's a question that has been asked for many years. The Society of Broadcast Engineers has sought to increase the technical expertise for many years. This concern has finally been addressed by Senator Olympia Snowe (R-ME).

In the middle of December, Snowe introduced Senate bill S.2881, which is titled the FCC Commissioners' Technical Resource Enhancement Act. The bill's basic purpose is to provide greater technical resources to FCC Commissioners. The bill is cosponsored by Sen. Mark Warner (D-VA).

The bill would amend Section 4(f)(2) of the



Communications Act of 1934 to add: "Each commissioner may also appoint an electrical engineer or computer scientist to provide the commissioner technical consultation when appropriate and to interface with the Office of Engineering and Technology, Commission Bureaus, and other technical staff of the Commission for additional technical input and resources, provided that such engineer or scientist holds an undergraduate or graduate degree from an institution of higher education in their respective field of expertise."

The Society of Broadcast Engineers broke the news of the bill. Just before it was released, Senator Snowe's office contacted the SBE to seek support of the effort. Naturally, the SBE is interested in working with the Senator to support the bill, and do what it can to see a similar bill introduced in the House.

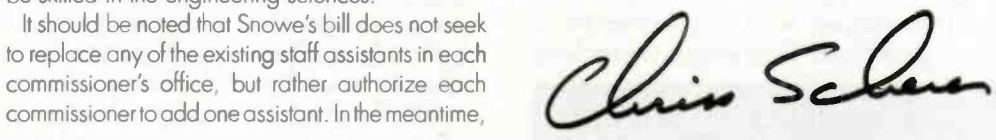
The SBE reminded me that the last serious attempt to increase the technical resources within the commissioner's offices was in October 1991 when Rep. Don Ritter introduced HR. 3301, which would have required at least one member of the Commission to be skilled in the engineering sciences.

It should be noted that Snowe's bill does not seek to replace any of the existing staff assistants in each commissioner's office, but rather authorize each commissioner to add one assistant. In the meantime, the bill has been referred to the Senate Committee on Commerce, Science, and Transportation.

Now that the legislation has been introduced, the time is right to ensure that it does not languish. The FCC makes too many important technical decisions, and technology will continue to move forward. It needs the technical shot in the arm this bill seeks.

I expect the bill will go to the subcommittee on Communications, Technology and the Internet. The subcommittee has the following members: (Democrats) John F. Kerry (chairman), Daniel K. Inouye, Byron L. Dorgan, Bill Nelson, Maria Cantwell, Frank R. Lautenberg, Mark Pryor, Claire McCaskill, Amy Klobuchar, Tom Udall, Mark Warner, Mark Begich, (Republicans) John Ensign, Olympia J. Snowe, Jim DeMint, John Thune, Roger Wicker, George S. LeMieux, Johnny Isakson, David Vitter, Sam Brownback and Mike Johanns.

This is a good time to contact not only these senators, but all senators and representatives to show that this bill is needed and welcomed.



What's your opinion? Send it to radio@RadioMagOnline.com

Grounding standards for broadcast

By Jeremy Ruck, PE

There is no "free lunch" when we consider grounding. The height necessary to create a station footprint typically results in a tower being the tallest thing around. Thus, lightning strikes dramatically increase, hence the necessity of proper grounding.

While there are similarities between various grounding methodologies, asking 10 engineers for their opinions will probably return a minimum of eight different and valid recommendations. That being said, winding up with eight different recommendations may demonstrate a lack of standardization in grounding procedures.

Statistically speaking, no substantial increase in the quantity of actual lightning strikes over the past few years has been fully documented. Back when current technology was the BC-1G and the FM-25H3, electronic components used to construct broadcast equipment were not as susceptible to static as current items. The likelihood of destroying

a vacuum tube or old-school transistor device by merely rubbing your hand across it was almost nil. Not so today. With current equipment, sometimes taking the item out of the bag incorrectly can result in destruction before it is even powered up. There's that free lunch again.

Higher frequency

So while in all likelihood your facility is getting hit this decade just as often as it did when Ronald Reagan was President, it may seem like it is getting struck more often due to the vulnerability of equipment. Previously many strikes probably went unnoticed due to the more robust nature of electronics in this arena. Grounding of a facility, which in reality may have always been marginal at best, is now a very real spectre that must be addressed.

This realization has led to the development of several (not necessarily fully inclusive) standards in recent years. Most engineers probably have some degree of familiarity with Motorola's R56 standard as well as content in both Rev G of TIA/EIA 222 and the National Electrical Code. In addition, IEEE also has several different standards running the gamut of the scope of grounding. None of these standards taken together or individually will prevent a lightning strike; rather, they are intended to provide some guidelines and standardization so financial and operational losses are minimized.

Each of the standards refers to the concept of single-point grounding (SPG), which is absolutely essential. The variances in the standards arise over subtle nuances in how this is achieved. Regardless of small differences, the SPG concept is crucial. The rise in ground potential that results from a lightning strike is manifest as a wave or surge that flows outward as it is dissipated. With a single-point scheme, all metallic objects are forced to rise and fall in potential together. While protection of equipment is very important, the failure to minimize the ground potential rise risk can also subject personnel at a facility to a rise in potential. The adverse biological effects of such exposure are well documented.

With the adoption of Rev G, we find that the maximum ground resistance has been set at 10Ω, similar to Department of Defense requirements in Military Handbook 419A. Portions of Motorola's standard take this a step further and discuss maximum resistance at 5Ω. In the case of Rev G, towers and their associated structural integrity is the primary concern, while the R56 standard is more inclusive, also covering the associated transmission equipment located at the facility. Ideally we would like to have the resistance to earth at 0Ω, but since we are stuck in an imperfect world, a finite resistance will always result.

Common practice

Certainly the most common earth ground scenario in practice today is a single ground rod driven by an electrician when electrical service is installed at a facility. From Military Handbook 419 we can

determine the resistance to ground in ohms of a single ground rod by the following:

$$R_O = \frac{\rho}{2\pi l} ln\left(\frac{4l}{d}\right)$$

In this equation ρ is the soil resistivity in ohm-cm, l is the rod length in centimeters, and d is the rod diameter also in centimeters. As an example, consider clay soil, where the resistivity varies from about 200 to 15,000Ω-cm, a single 10'-3/4" rod would result in an earth-to-ground resistance typically ranging anywhere from 0.7 up to 50Ω. If the structure is located on rock where the resistivity can range from 50,000 to 1,000,000Ω-cm, then the resistance to earth could be greater than 3,300Ω. So unless you are located in the ocean or a marsh, which of course breeds another set of issues, a single ground rod comprising your single point ground is really insufficient to protect your facility.

Under Rev G we see an increase in the number of ground electrodes over that specified in Rev F. The previous version specified three ground rods for a self-supporting structure, while Rev G specifies six. For guyed towers we have seen an increase from two to three rods at the base, and monopoles, addressed for the first time, require six symmetrically spaced rods around the base with a minimum 20' separation between them. Note that these are minimums, and under certain soil conditions may not be sufficient to address proper mitigation. The standard of course covers this by requiring tower owners to verify ground resistance at or below the 10Ω value already discussed.

While we are in the lull before thunderstorm season, be sure to take stock of your grounding situation and make repairs or upgrades. Yes I know it is a long walk out to the guy anchors, but include them in your inspection. Foundation work is always much more expensive than swapping out a stack of NIC cards.

While progress certainly has been mode recently in addressing lightning strikes and resultant damage, standards typically specify minimum requirements. I am sure everyone agrees that each individual station is distinct. While standards provide an easy cookie-cutter approach, you should in no way limit yourself to the absolute minimums. The small investment in time and expense now could possibly reduce heartburn in a few months.

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

SCMS INC.
YOU KNOW WE KNOW RADIO!
www.SCMSinc.com

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

LPFM relief bill nears passage

By Harry Martin

After several years of stalled efforts, the Senate Commerce Committee approved S.592 (the Local Community Radio Act of 2009), a bill that would repeal the LPFM third-adjacent channel protection requirement contained in Section 73.807 of the Commission's rules. The bill is now eligible for consideration by the full Senate. A corresponding House bill (H.R. 1147) cleared Committee in mid-October. As a result of these actions, congressional approval of this legislation is now likely. Assuming the White House approves, too, third-adjacent channel protections could be repealed during the first quarter of 2010.

While the Senate and House bills focus on the LPFM service, full-power FM stations should be aware of the broader impact that removal of the protections will have. Besides the possibility of more interference, the change will make it possible for the FCC to authorize many more new LPFM stations. The FCC is likely to open a filing window for such new stations during the first or second quarter of 2010.

The new law, if adopted, is part of a pattern of technical deregulation for LPFM. The Commission modified its LPFM rules in 2007 to relax considerably the extent to which LPFM stations have to protect second-adjacent channel full-service stations. That rule change was upheld in 2008 by the U.S. Court of Appeals for the D.C. Circuit. Thus, second-adjacent protection has already been seriously weakened. The pending legislation would end third-adjacent protections – leaving full-service stations with full protection only against co- and first-adjacent channel LPFM interference, and only partial protection from second-adjacent channel LPFM stations.

While the legislation seems to be geared primarily toward the paring back of protection, it ironically would create a new species of protection which could give the Commission new enforcement headaches. The bills mandate that third-adjacent protection from LPFM interference is to be retained with respect to full-service noncommercial educational FMs "that broadcast radio reading services via a subcarrier frequency." But this exception is based on a flawed understanding of the FCC regulatory framework. SCA operation is largely unregulated and unmonitored by the Commission. Thus, FCC currently has no way of knowing, from one day to the next, which stations happen to be using one or both SCAs for radio reading services. The agency will only know whether the extra degree of protection is warranted is if the effected FM station volunteers the information. Since providing SCA service will, under the new law, afford a full-service NCE station a greater measure of interference protection, it would not be surprising to see an upsurge in such services shortly before the LPFM filing window.

Dateline

Jan. 11 was the deadline set for filing of biennial ownership reports for all commercial broadcast licensees. This date may be changed again, however. Check www.commlawblog.com for updates.

For *noncommercial* radio stations in Arkansas, Louisiana, Mississippi, New Jersey and New York, the biennial ownership report deadline is Feb.1.

Feb.1 is the deadline for radio stations in New Jersey and New York to electronically file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC.

Feb. 1 is the deadline for radio stations licensed in the following states to place their annual EEO Reports in their public files: Arkansas, Kansas, Louisiana, Mississippi, Nebraska, New York, New Jersey and Oklahoma.

FCC rescinds ill-conceived fine

In a case that became a common cause of broadcasters over the past several months, the FCC reversed a $5,000 fine imposed on a Southern California FM station for not including an end-of-message code after transmitting an EAS test. The station voluntarily serves as the local primary station for the regional EAS network. In that capacity, the station volunteers to send emergency messages, weekly and monthly tests to other local radio stations in order to assist in emergency preparedness.

At the end of any EAS message or test it transmits, a local primary station is required to send a signal to let downstream stations know the message is over. Following one test, station personnel forgot to send this end-of-message signal and, as a result, several stations dutifully continued broadcasting the primary station's programming. The $5,000 fine followed.

After a round of protests from NAB and others, who admonished the agency for discouraging volunteerism in the EAS community, the Commission cancelled the fine. However, the FCC still formally admonished the station and required that it prepare and submit compliance reports.

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

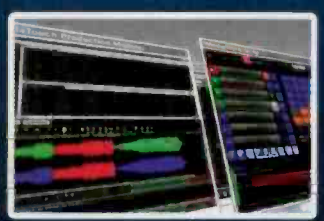
When was the last time you touched something that looks this good?

The new iMediaTouch Version 4.0 is here.

New Graphical User Interface ▸▸ New Features ▸▸ Improved Functionality

iMediaTouch

Contact our sales department today
at 888-665-0501 or via email at:
sales@imediatouch.com



▸▸ Watch a video demo of
iMediaTouch 4.0 in action!
www.imediatouch.com

omt technologies

HIGHER POWER IBOC

Increasing IBOC power is no trivial matter; now is the time to plan.

By Doug Irwin, CPBE DRB AMD

On Nov. 5, 2009, NPR and Ibiquity Digital jointly submitted to the FCC a proposal for an IBOC power increase. As of this writing, the Commission has not yet acted on the proposal; however, it does appear that an IBOC power increase is imminent. The heart of the proposal is a blanket 6dB increase in IBOC power levels – but there are a few more details worth looking at. In a nutshell, NPR and Ibiquity are proposing the following changes to the Commission's rules with respect to IBOC:

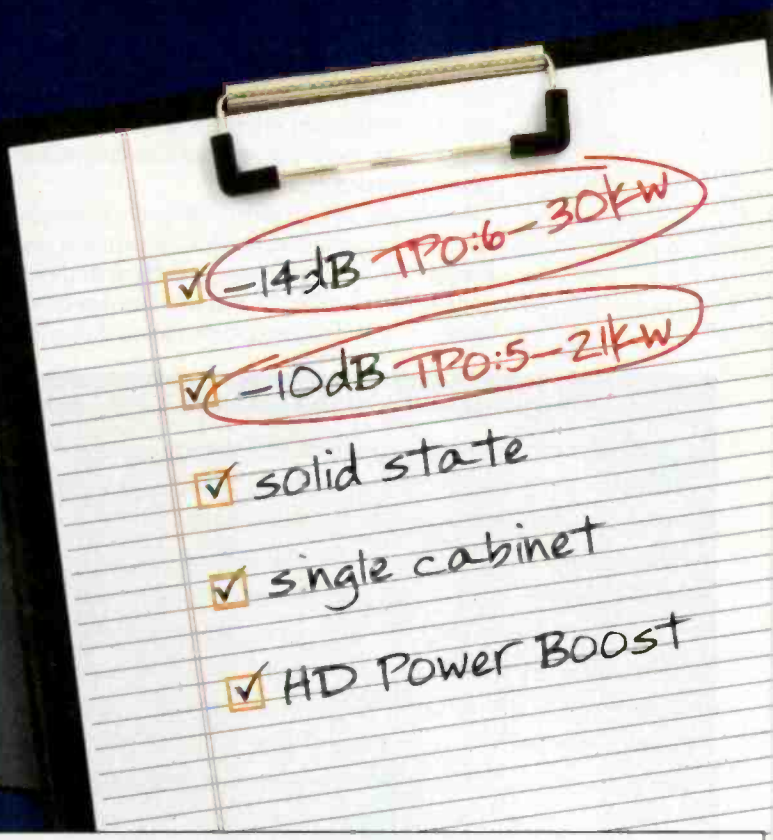
- A 6dB blanket power increase (-14dBc) for all stations *except* super-powered, grandfathered Class B stations. These stations would be limited to the greater of two levels: the current -20dBc level, or at least 10dB below the *Class B equivalent* power for their height.
- The potential for a power increase to as much as -10dBc, depending upon conditions that limit harmful interference. Stations wishing for more than the 6dB blanket power increase would have to apply to the Commission for permission to do so. NPR has posted an IBOC power calculator online.

The filing also specifies a means by which harmful interference complaints can be resolved by the Commission.

If you currently have a Class-B super-grandfathered station, then this proposed rule change might not affect you at all. Say for example you have a super-power grandfathered Class-B with an ERP of 80kW, while the Class-B equivalent at that same site and antenna height is 8kW. Your current IBOC power would stay the same because 20dB below 80kW is the same as 10dB below 8kW.

more -14dB more -10dB

more of your bases covered



No one else builds single-cabinet, solid-state transmitters with power outputs of 6kW – 30kW in -14dB hybrid mode and 5kW - 21kW for -10dB. And only Nautel gives you an option for even more power in the same cabinet with HD Power Boost. That means more flexibility in planning for higher injection levels. Expect more; more engineers, more innovation, more -14db and -10dB power.

Learn more at www.nautel.com/-14dB

Making Digital Radio **Work.**

nautel

902.823.5131

www.nautel.com/expectmore/

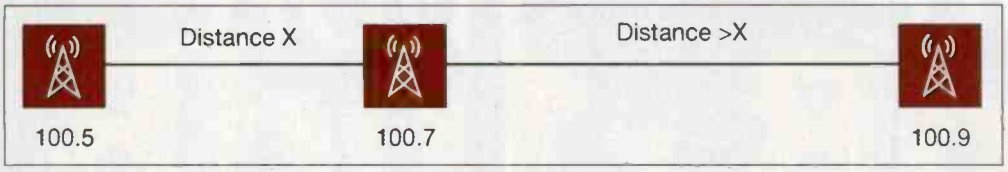


Figure 1. Physical spacing may allow a station to transmit an asymmetrical hybrid signal to achieve the power increase.

Other options

One means by which some stations may be able to exceed the -14dBc limit is by transmitting the IBOC sideband groups in an asymmetrical fashion (currently those sideband groups – one group above the center frequency, and one below – are transmitted with the same amount of power). If a station wishing to increase its overall IBOC power has a first-adjacent channel station below it in frequency that is physically closer than the next station above it in frequency (as illustrated in Figure 1), then it is clear that for a given undesired-to-desired ratio (based strictly upon the distance between the stations) more power could be transmitted in the upper sideband group.

A means by which harmful interference complaints can be resolved is also proposed. If, for example, station Y is transmitting IBOC in excess of -20dBc and causes interference inside of station X's protected service contour, then station X may file a complaint against station Y with the Commission by completing the following steps:

1. Station X must include in its complaint at least three interference complaints and evidence of on-going rather than transitory harmful interference inside its own protected contour;
2. Station X must document any test measures used to identify the IBOC-related interference, and;
3. Station X shall document the extent of the interference.

The FCC will have 90 days after station X's filing to resolve the complaint. If the FCC does not do so, then station Y will be compelled to lower its IBOC power, in 3dB steps, to as low as the original -20dBc level (but not lower).

Xmtr	Analog and Digital Common Amplification TPO in Watts								
	-20dBc			-14dBc			-10dBc		
	Com	A	D	Com	A	D	Com	A	D
[illegible]	413	409	4	355	341	14	240	216	24
[illegible]	825	817	8	710	682	28	480	432	48
[illegible]	2800	2772	28	2410	2314	96	1629	1466	163
[illegible]	4125	4084	41	6550	3409	141	2400	2160	240
[illegible]	6000	5940	60	3875	3817	158	3195	2876	320
[illegible]	8000	7920	80	5300	5089	211	4260	3834	426
[illegible]	16000	15840	160	13600	10178	422	8520	7668	852
[illegible]	25000	24750	250	14300	13731	569	9100	8190	910
[illegible]	[illegible]	20792	208	17000	16349	651	15000	13636	1364
[illegible]	[illegible]	[illegible]	605	37830	36382	747	32980	29982	2998

Transmitter power deratings for some Harris transmitters at increased digital sideband powers.

Specific situations

If your station is interested in implementing higher power IBOC, then one of two cases must be true already: You currently transmit IBOC and need to consider the implications of raising the power to (at least) -14dBc; or, you are planning on transmitting IBOC for the first time. Let's assume the former, and take a look at how to increase your current IBOC power first. We'll look at new systems afterwards.

Perhaps the most common way to transmit IBOC has been by way of a -10dB coupler inserted in the output of the analog transmitter. At least four manufacturers (Dielectric, ERI, Shively and Jampro) make this type of device and assuming they all produce a new version (-4dB injection) then it should be a relatively easy matter to simply swap out the old with the new. The good news here is that the amount of waste heat formerly dumped into the waste load is going to be reduced.

One advantage to this type of coupler (at least at the -10dB injection level) is that there is an exceptional amount of isolation between the analog port and the digital port; a quick look at published specs of the four manufacturers shows 36dB minimum (with good VSWR). The rule of thumb has been -30dB of isolation between the analog and digital ports in an IBOC system (at minimum). In communications with these same manufacturers I was reminded (with respect to higher IBOC power levels) that isolation from the digital ports back in to the analog ports will now also be an important spec to consider, as the chances of generating intermod products in the output of the analog transmitter will now become a distinct possibility. Make sure you consider that specification when choosing a particular brand and/or model of coupler.

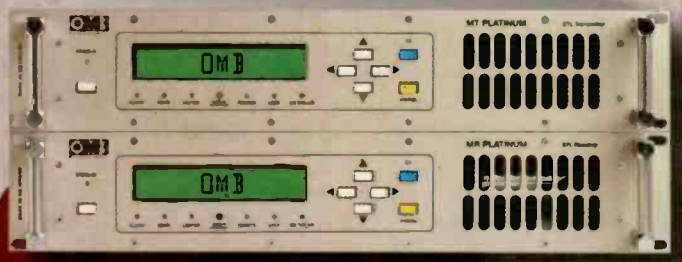
Another common method of getting IBOC on the air has been to use an auxiliary antenna. This was a very expedient method in many cases. However, because the new power level is four times that of the old, there isn't going to a simple way to achieve the increased ERP using the same old antenna. At minimum, you would need a new transmitter; and one that has four times the power capability as the old could be an expensive proposition. You would likely need to upgrade the ac power and air conditioning capability as well. A compromise might be changing the auxiliary antenna to one with more power gain (for example, doubling it) and then buying a new IBOC transmitter that has twice the power output capability as the old one. As in any power upgrade, be certain that the coax in place can handle the additional power; add 5.5dB to the nominal IBOC power to account for the peak-to-average ratio.

Probably the least common method of getting IBOC on the air has been the split-level combining method. This is a system that makes use of the analog transmitter; a combined-amplifier transmitter (meaning the digital and analog signals

OMB
BROADCAST

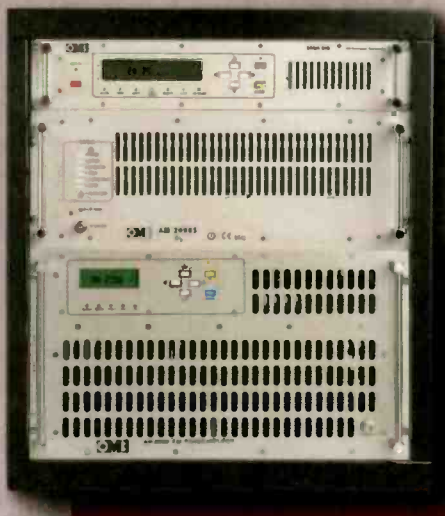
FM TRANSMITTERS

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 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 works independently thanks to a power combining structure that provides high isolation between them.

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

amplified together) and a high-level combiner that adds the two transmitter outputs together to generate the correct amount of analog and digital power in its output. This system works well especially when the analog transmitter has a lot of power capability, but not the 10 percent headroom necessary when using a -10dB IBOC injector. When increasing the IBOC power level, it will be necessary to derate the analog output level of the combined amplifier; but, depending upon how much headroom is available in the analog-only transmitter, you may be able to make up for that reduced analog relatively easy. The ratio of analog power contributed by the analog-only transmitter to that of the combined-amplifier will increase, so that the output of the combiner has the newly increased IBOC level, with the same analog level as before.

New installations

If you are considering implementing IBOC for the first time for your station, or if you are plan to quadruple the current IBOC power level, it is incumbent upon you to look in to either a combined-amplifier type of transmitter, or an antenna with an IBOC port. If your station uses high-level combining now (by way of the -10dB injector) you'll likely find the power upgrade relatively inexpensive and painless; however, if you are using space-combining I believe you will find that a new transmitter or antenna will be close in cost to the upgrades of the old system.

Let's consider a new antenna first. All four of the major antenna manufacturers offer at least one antenna model with both analog and IBOC input ports. In the case of Jampro, it's the JSHD; for ERI, it's the Lynx. For Dielectric, it's the HDR series of interleaved elements; Shively offers an interleaved antenna as well, such as its 6813.

One advantage to using the dual-input antenna type is that the characteristics with respect to the radiation pattern will match between analog and digital. The analog power doesn't change; simply feed the digital port with enough TPO to make the -14dBc ERP requirement. As an added bonus, the digital port can become a backup input for the analog transmission (albeit lower power). Ask any potential vendors about the digital-to-analog as well as the analog-to-digital port isolation.

As I wrote earlier, the rule of thumb has been a minimum of 30dB of isolation between ports. You could add isolators to the digital transmission line to improve the isolation from the analog port, but the other direction could be more of a problem. I've been assured by each of the four vendors mentioned that the digital input ports to their antennas will handle -10dBc, so obviously -14dBc will not be an issue.

Perhaps you are very happy with the antenna you already have, but would consider replacing your current analog transmitter with a combined-amplifier type. Fortunately a lot of transmitter development has gone on over the last five years and buying this type of transmitter is easier now than it was way back when.

Nautel offers an extensive line of all solid-state combined-

Mixing, Matching & Distribution

ATI brings you 30 years of reliable products for A/V, Broadcast, Large Venue, Touring Sound and System Integration

ATI

www.atiaudio.com

Audio Technologies Inc. 856-626-3480 ■ sales@atiaudio.com

amplifier style transmitters as the NV Series. This line extends from the NV3.5, with an analog power rating of 2,700W of analog at the -14dBc IBOC level, up through the NV80, which will make 57,600W of analog in the -14dBc mode. The Nautel Power Boost is a peak-to-average-power reduction technique that Nautel estimates will effectively boost the analog power capability of the NV Series transmitters by about 1.3dB.

Harris has been busy working on its IBOC transmission technology as well. It offers three lines: the ZX series (500W up to 5kW); the Z/HD+ series (4kW up to 32kW); and the vacuum-tube series that includes the HT/HD+ and HPX20 through HPX 80. Harris is also working on its version of peak-to-average power reduction, and will introduce it at the 2010 NAB Show. Harris expects to gain about 25 percent more analog power from its combined amplifier types when this algorithm is fully implemented.

At the time of this writing, Broadcast Electronics is in the process of evaluating and optimizing its transmitter line for proposed IBOC power increase.

Because the proposed IBOC power increase hasn't yet been approved by the FCC, it may be a little early to budget for transmission facility upgrades – but at the very least you should be in the planning stage. Increasing IBOC power by even four-fold is no trivial matter, and it could affect the entire infrastructure of your transmission facility. If you believe that terrestrial broadcasting has a continuing future, as I do, then now is the time to plan for it.

HD Radio Injection Level Analysis Tool

Enter analog TPO here in watts → 15,000

HD Injection Level / Analog TPO

Model	-20dB	-18dB	-16dB	-14db	-12dB	-10dB
NV3.5	3,375	3,206	3,038	2,700	2,312	1,941
NV5	4,500	4,275	4,050	3,600	3,083	2,588
NV7.5	6,750	6,413	6,075	5,400	4,624	3,881
NV10	9,000	8,550	8,100	7,200	6,165	5,175
NV15	13,500	12,825	12,150	10,800	9,248	7,763
NV20	18,000	17,100	16,200	14,400	12,330	10,350
NV30	27,000	25,650	24,300	21,600	18,495	15,525
NV40	36,000	34,200	32,400	28,800	24,660	20,700
NV60	54,000	51,300	48,600	43,200	36,990	31,050
NV80	72,000	68,400	64,800	57,600	49,320	41,400

Capable of meeting injection level at that Analog TPO

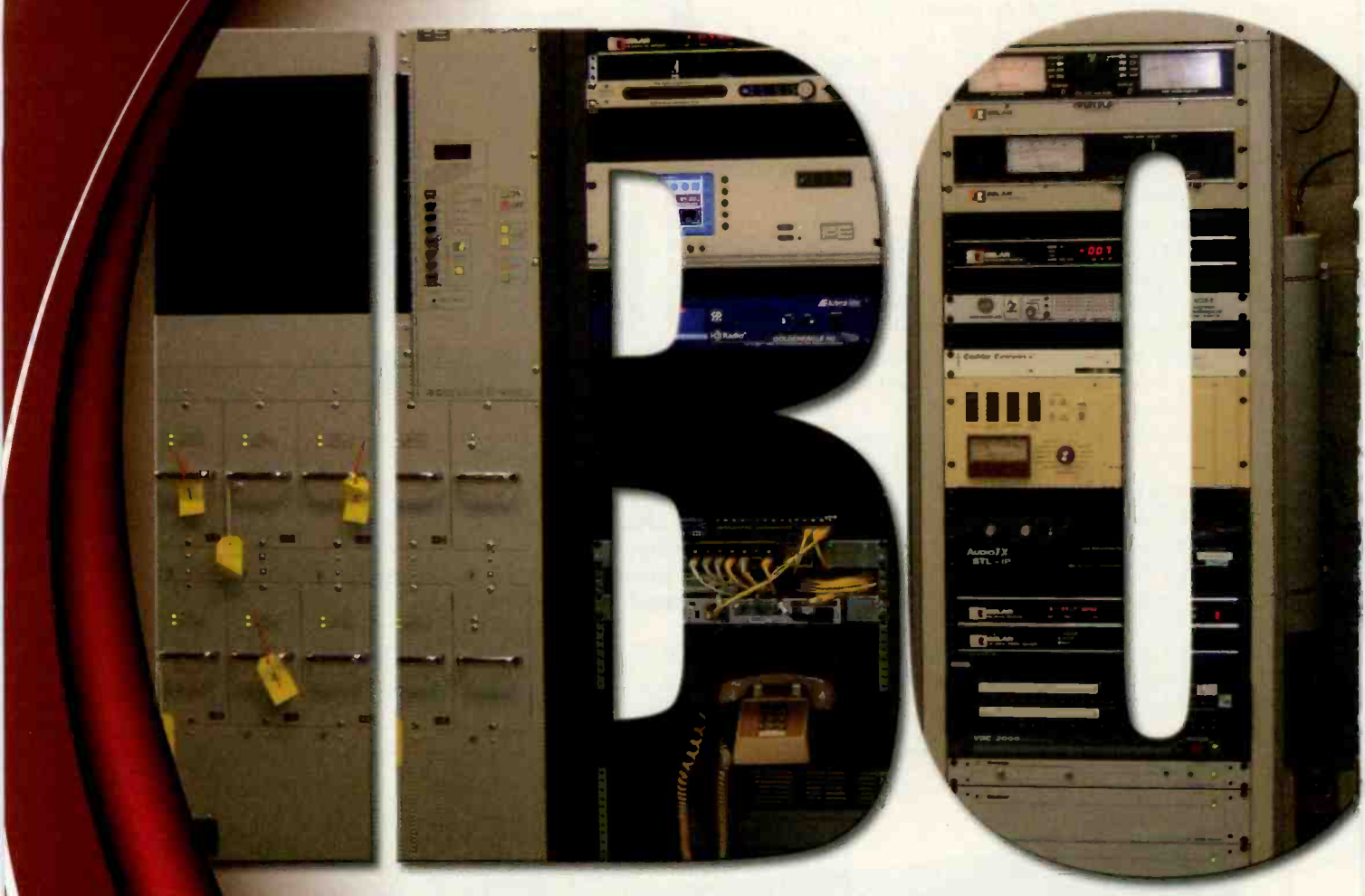
Capable of meeting injection level at that Analog TPO with HD PowerBoost

Capable of meeting injection level at that Analog TPO with In-cabinet upgrade

All specifications subject to change. Rev 11/26/09 CWK
All estimates based on VSWR < 1.05:1, 3dB headroom to HD sneak, and current NRSC measurement recommendations.
For example, if you enter 11,000 as the Analog TPO, the cells highlighted in Green indicate the Transmitter Model / Injection level combinations that are possible with the standard transmitter. Blue cells indicate combinations which requires the use of HD PowerBoost and Yellow cells indicate the need to upgrade the transmitter via an in-cabinet upgrade.

Nautel offers an Excel file tool to determine if a transmitter is capable of delivering the increased digital power, and what steps need to be taken to accommodate the increase.

Irwin is transmission systems supervisor for Clear Channel NYC and chief engineer of WKTU, New York. Contact him at doug@dougirwin.net.



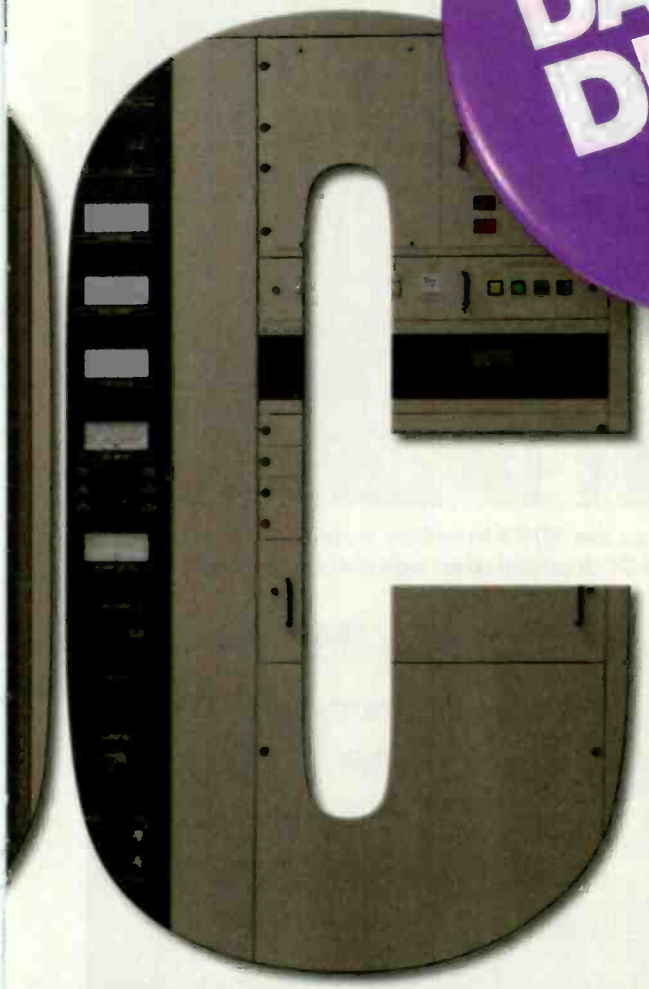
19 Years in the

The coming of HD Radio to WKSU began in 1991

By Ron Bartlebaugh, CBNT

It was a balmy April afternoon in Las Vegas when I boarded the bus in 1991 for a tour through the city. No, it was not a sightseeing trip but rather a drive around town to listen to a DAB FM test station. Each seat on the bus had a set of headphones and an A-B switch. Switch position A provided the analog audio side of the broadcast and position B presented the latest and greatest in digital FM broadcast technology – clean, noise-free, high-fidelity program audio. The difference between the low-power test transmitter's analog broadcast and its DAB signal was highly impressive – especially when the analog signal went into noise and the stereo image collapsed. It was on that balmy Las Vegas afternoon that I first caught the vision for just how much FM broadcast audio might be improved. I have never lost focus of that vision.

We now fast forward through many years of hopes, dreams, and promises made by DAB and IBOC technology developers to the present day adoption of in-band on-channel (IBOC) AM and FM broadcast technology as the U.S. standard. Like so many stations across the country over time, WKSU's management team has maintained a close watch on the development



Making

on a tour bus in Las Vegas.

of IBOC technology, its potential benefits, costs, and perhaps turning out to be the most important, the timing of its availability in relation to other competing listening technologies including satellite and Internet radio.

Going digital

In 2003, WKSU chose to construct its fourth FM repeater station, a 4kW facility located in north central Ohio. Via grant funding provided from federal and state government agencies, a decision was made to have this repeater station, WNRK, become the first IBOC broadcast facility within the WKSU network of stations. The station went on the air in 2004 using a Harris Z hybrid transmitter to provide an analog and IBOC HD-1 signal. Audio delivery to the site at that time was by a high-quality FM tuner receiving the WKSU analog signal for rebroadcast.

WKSU management continued monitoring IBOC technology progress, implementation across the country, receiver availability and market penetration. Questions about its benefits to the station's public radio operation began to rise – especially regarding the potential costs required to bring the entire network of stations (five full power and two translators) up to IBOC capable standards.

In 2005, with assistance from a grant received from the Corporation for Public Broadcasting (CPB), the opportunity came to add an IBOC signal to WKSU. That led to more questions as to what method of IBOC transmission technology to use. Our broadcast engineering team settled on a Harris Split-level system that required the addition of a Harris Z transmitter, a Dielectric RF combiner, a reject load, and all of the related RF plumbing. Fortunately, the WKSU transmitter building was large enough to accommodate the additional equipment including sufficient electrical and ventilation systems. The Split-level system was successfully added to WKSU's Broadcast Electronics FM-20T analog transmission system. At that time, program audio delivery to the site from WKSU's Broadcast Center located 13 miles away on the main campus of Kent State University in Kent, OH, was via a Harris CD microwave link with an Intraplex T-1 delivery system backup. Both systems were limited to 15kHz high frequency response so WKSU's HD-1 signal was on the air but not yet with a full 20kHz audio signal for use on the IBOC signal.

As the journey continues through time, the fast-forward button takes us to the year 2008. WKSU had a major decision to make. Either add 5,000 square feet onto the Broadcast Center building or complete the installation of IBOC technology at its non-IBOC stations and further enhance the network with the implementation of multicast channel and program associated data (PAD) capabilities for each station. As station management faced the launch of a capital campaign, a professional firm was retained to conduct a feasibility study with potential significant donors for purposes of determining which project they would be more likely to endorse. Surprisingly, the wants, needs and demands for more "channels" – both via broadcast and Internet – won out. The quiet phase of a digital conversion capital campaign was launched and a commitment to have a complete IBOC/multicast, PAD-capable network was made.

The WKSU network of stations, Ohio's largest combined FM radio signal, collectively reaches a widely diverse audience throughout all or part of 22 counties in northeast

Broadcast Solutions
- from -
audio-technica

NEW!

BPHS1
Broadcast Stereo Headset
Smooth, natural sound, long wearing comfort and rugged construction
~~MSRP $279~~ **Only $199**

NEW!

AT4080
Bidirectional Active Ribbon Mic
Smooth, rich sound and active electronics in a durable side-address design
~~MSRP $1,245~~ **Only $999**

2-PACK!

ATH-M35 2-Pack
Closed-Back Studio Headphones
Clear sound and impressive power handling in a compact, folding design
~~MSRP $278~~ **Only $99**

Your smart source for Audio-Technica & more:
PROAUDIO.com
smart sound solutions
a Crouse-Kimzey Company
Celebrating 39 Years of Excellence
www.proaudio.com · (800) 433-2105

DAB '91 DEMO NAB

19 Years in the Making

Repeater station WKRW has the 1992 installed analog Harris transmitter and the new IBOC transmission equipment behind.

Broadcast Electronics FMi-1405 IBOC transmitter and associated equipment at repeater station WKSV

and north central Ohio. Nearly four-million persons reside in the region that ranges from densely populated urban areas to rural, agriculturally oriented communities. The need to provide programming of significant value to a diverse audience led to a design goal of being able to program the analog and all digital channels of each of the five full-power stations (main and four repeater stations) independently with origination occurring at the Broadcast Center. With the help of generous capital campaign contributors and multiple grants received from the Corporation for Public Broadcasting, the WKSU total IBOC commitment was launched and the multi-channel centralcasting concept design undertaken.

Accepting the challenge

Challenge number one was how to get the analog, RBDS and the IBOC data stream (HD-1, HD-2, HD-3 and PAD) to each transmission facility. Terrain limitations, tower loading issues, and overall costs quickly eliminated the possible use of a microwave network. Ku band satellite delivery became a brief consideration; however, the northeast Ohio climate does not favor reliable Ku signal delivery. Internet delivery was not an option because of compression, timing and many other issues inherent with the Internet. Thought then turned to the use of T-1 lines. Through a special relationship with Kent State University and the state of Ohio, WKSU was able to obtain a T-1 line

to each transmitter site with all lines originating from the Broadcast Center at a total cost that was the same or somewhat less than what monthly satellite delivered bandwidth costs would have been. With design assistance provided by Broadcast Electronics in conjunction with WKSU's IT department, an STL-IP delivery system was developed using the Audio TX by MDO-UK equipment along with Cisco Systems routers and switches. In addition, the STL from the Broadcast Center to WKSU's transmitter site now includes a Mosley Starlink microwave system that operates parallel to the STL-IP T-1 line delivered system with automatic switchover in the event of either path's failure. The new STL systems provide full 20kHz audio.

Next came the need to upgrade the analog transmitters at repeater stations WKRJ, WKRW, and WKSV. Based on power level requirements and costs, the Broadcast Electronics model FMi-301 solid-state transmitter was chosen for WKRJ, an FMi-201 for WKRW, and an FMi-1405 dual-cabinet system for WKSV. Ventilation system upgrades also had to be made at each of those stations because of the increased IBOC transmitter heat output. The existing analog transmitters at WKRJ and WKRW became standby units with the installation of a motorized RF switch for easy remote transmitter selection when required. While WKSV already had a standby transmitter, the main transmitter, a CCA FM-12,000, had to be removed from the Rohn 12' x 18' prefab building to make room for the new transmitter. The arranged logistics

Equipment list

Audemat Golden Eagle HD/FM
Audio Science 6585
Axia Livewire AES/EBU audio node
Barix Exstreamer 1000
Belar RFA-4
Bird Electronic 3129 BPM, BPME1-VM, BPME3-VM
Broadcast Electronics FMI-1405, FMI-201, FMI-301, FXI-250, FXI-60, IBOC rack cabinets, IDI-20, RDI-20, TRE Message Manager, XPI-10
Day Sequerra M2.2R, M4.2 R
Dielectric R101873025
MDO UK Audio TX
Moseley Starlink SL9003-4SLAN
Neural Audio Neustar SW4.0
Omnia One
Orban 8500FM

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

FM & AM Mod-Monitors

Model 531 for FM

Model 525 for AM

- Accurate off-air measurements – built-in preselectors with front-panel digital tuning.
- Local and remote alarms for overmod, carrier loss and program audio loss.
- Time-proven industry workhorse monitors for dependable everyday station use.
- AM monitor supplied with weatherproof loop antenna.

www.inovon.com
Inovonics
800-733-0552

Read what our users say...

KJDL, Lubbock, TX

" I like (Xtreme) a lot! Once we got things together we never have any problems. (Xtreme) is a 9 out of 10 for usability. It didn't take me long to figure out, I picked up most of the major (features) in the first day. (The Xtreme) is user-friendly for all involved."

Jessie Walker, Program Director

DMS Broadcasting, San Francisco, CA

" When we started, we were jumping into something we knew nothing about! We called your tech support & within a day they had a solution. It was miraculous. They helped us get wired up & set up. (Tech Support) had a positive & upbeat attitude. They went above & beyond!"

David Trudrung, General Manager & Co-owner

WDHC, Berkley Springs, WV

" We are absolutely pleased. I especially like the game scheduling feature, it works great for Mountaineer West Virgnia University games. I rate it a 9 ½ because we can schedule 2 games simultaneously & flip flop when there are rain delays. It works great for sports talk!'

Mike Hurst, Engineer

KSVL, Yerington, NV

" I love (Xtreme)! We've been running (Xtreme) for a year & a half every single day & we give it a 10! It's easy to learn & use. Good support & it's dependable!"

George Lemait, Station Manager

KSMZ, Alexander, AR

" Xtreme has more flexibility, sounds better & has fewer problems then our stations running (other automation systems). It's easier to program & a 9 compared to other programs out there."

Scott Gray

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

DAB '91 DEMO NAB

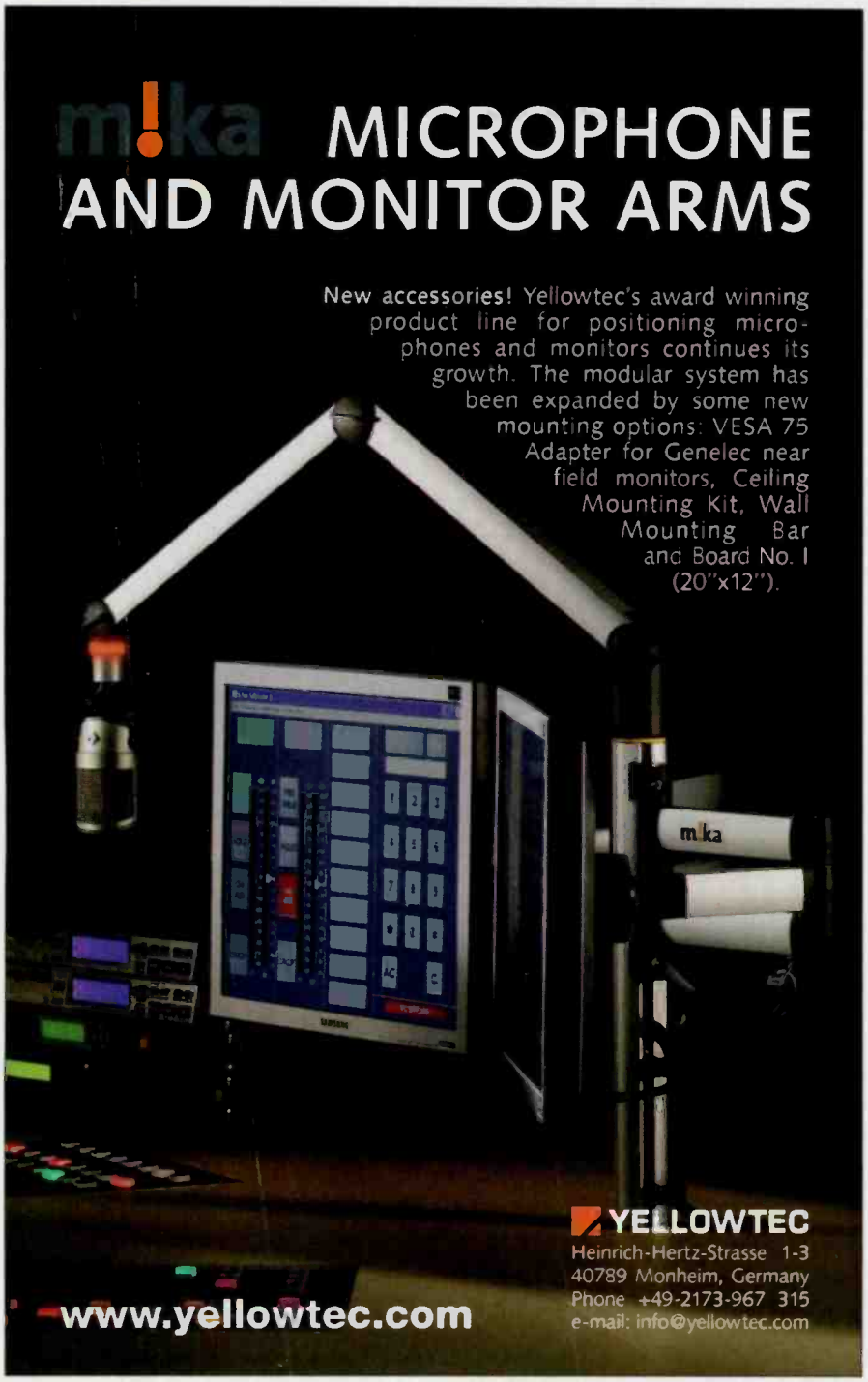
19 Years in the Making

provided for the removal of the CCA transmitter first thing in the morning and the placement of the new transmitter that same morning. Broadcast Electronics model FXi-250 exciters were installed with each new transmitter. The WKRJ and WKRW projects took place in late May/early June of 2009 and the WKSV project was completed in July of 2009. Prior to these projects, the exciters at the 2004 constructed WNRK repeater station and at WKSU's transmitter site were upgraded to a Broadcast Electronics exciter model FXi-60 (WKSU in July of 2008 and WNRK in January 2009) to enable the broadcast of the IBOC stream. Broadcast Electronics RDi-20 accelerated RBDS generators were also installed at each transmitter location for broadcast of RBDS on the analog side.

To facilitate the independent multicast program distribution to each station, five Broadcast Electronics model IDi-20 importers and five model XPi-10 exporters were installed in the Broadcast Center's master control room – a set for each station. Additionally, five Orban 8500HD units for audio processing of the analog and HD-1 channels were installed in the newly placed master control room rack cabinets (seven new cabinets that include 30 Arbitron PPM encoders plus four existing cabinets). A Neural multi-channel audio processing system is utilized to establish the audio quality for the HD-2 and HD-3 channels. Audio sourcing and routing is largely managed by an Enco automated program delivery system (soon to be updated to all linear storage) along with the use of multiple Axia Livewire audio nodes. PAD and RBDS information is handled by a Broadcast Electronics TRE message managing system for each station. Monitoring of each transmission facility is accomplished via existing remote control systems operating in ATS mode and an on-site Audemat Golden Eagle HD monitor at each station – all networked for remote monitoring – along with Day Sequerra model M4 HD tuners.

Regional awareness and popularity is growing for WKSU's globally accepted folk music channel (Folkalley.com) broadcast on the HD-2 stream and an all-classical music offering on the HD-3 channel. During WKSU's recent fall fund drive the station placed 589 HD capable radios in the hands of donors who pledged at the $180 level. Generous underwriting friends of the station provided those radios at no charge to WKSU. WKSU's HD-3 all classical stream is also heard over Cleveland's WNWV HD-3 channel by special agreement between the two stations. The station will continue promotion of HD Radio to the region and has received a grant from CPB to develop an HD-4 channel with cooperation from Ibiquity Digital and Broadcast Electronics. Existing Broadcast Electronics exciters and importers are to be upgraded by special arrangement from BE when the product becomes available. Pending IBOC signal power increases are to be addressed on a station-by-station basis if and when approved by the FCC.

WKSU's in-house IT staff of Chuck Poulton and Dan Kuznicki, both of whom have excellent broadcast background, played a pivotal role in the development of this system and continue to work hand-in-hand with my long-time assistant Bob Kruppenbacher and myself in maintaining our extensive IBOC/HD Radio



Flagship station WKSU's analog equipment row on the left and its Harris Z model IBOC transmitter on the right across from a Broadcast Electronics FM-20T analog transmitter installed in 1997.

A close up view of WKSU's split level IBOC combining system and main/standby antenna switch.

broadcast system. And, it should be noted that this very large long-term project would not have been possible without the fund raising expertise of WKSU's Executive Director and General Manager Allen Bartholet and his development associate Pamela Anderson along with the splendid cooperation that we received from both the WKSU and Kent State University business offices.

It has been many years since I rode the bus on that balmy April day in Las Vegas and wore the required badge that gave me passage onto the bus. The badge reads, DAB '91 Demo. I have that badge on my office bulletin board and glance at it at least once each day just to remind me that what happens in Vegas doesn't necessarily stay in Vegas.

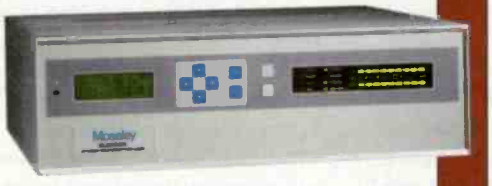
Bartlebaugh is director of broadcast engineering, the WKSU Stations, Kent State University, Kent, OH.

Photos by Bob Kruppenbacher.

FACILITY FOCUS

The technology behind WKSU

Moseley Starlink SL9003Q



The SL9003-4SLAN used by WKSU provides two 32kHz stereo program feeds with RS-232 data, plus a 384kb/s simplex Ethernet data channel. This is just one member of the Starlink digital STL family, which includes two-, four- and six-channel models that can be tailored for any station topology. Starlink features an optional LAN module for transport of the UDP stream for HD Radio. RS-232 channels are included to support RBDS. Starlink's modular construction and user-friendly front panel controls allow easy reconfiguration when needs change. Selectable QAM modulation allows high payload capacity in 200-500kHz STL channels. Starlink is available in all popular STL frequency bands worldwide. With more than 3000 systems in the field, Starlink is the proven STL leader.

www.moseleysb.com
805-968-9621

Broadcast Electronics Transmission Equipment

Broadcast Electronics is the transmitter manufacturer of choice for Kent State University and other broadcast leaders in the U.S. and overseas. BE offers a full line of solid-state and single-tube transmitters for AM, FM and HD Radio or HD Radio-ready installations, including for proposed hybrid power outputs. Its newest member, BE's STX LP low-power transmitters, offers in-field scalability from 1kW to 5kW for analog FM now and HD Radio conversion later. Included in the STX LP is an internal exciter, backup controller and IP connectivity, all for a starting price under $7000. In addition to transmitters, BE makes the popular AudioVAULT studio automation system and The Radio Experience (TRE) data management suite, plus products for multicasting and tools for sending text messages over HD Radio and RBDS signals.

www.bdcast.com
217-224-9600

Tips, tricks, hints and more

By Chriss Scherer, editor

Cover that wire label

Labeling wires is a common task, and you have likely tried many methods. I have seen sticky labels covered with clear heat shrink. I have seen clear tape-like tabs as well. (We have covered these in an earlier edition of Tech Tips.) There are plenty of variations available.

Everyone knows about the Brother P-touch for labeling. Dymo, while better known for its 1970s hard labels, has also joined the label tape ranks. I have seen some people try to wrap a P-touch label around a wire only to have it curl off within days. Dymo offers heat shrink tapes for its Rhino labelers, which can be very convenient, but buying and carrying yet another piece of equipment and keeping stocks of the labels on hand is not always the simplest answer.

Robin Cross, chief engineer of KCUR Kansas City, was looking for a low-tech approach. He has tried the label tape approach, but did not like how the labels do not stay in place. He tried covering the labels with clear desk tape, but that doesn't work well, either. The desk tape is stiff, and it can wrinkle, which obscures the label.

Cross searched and found 3M Scotch 190CL tape. The 190 series of tape is a stretchy plastic tape. The CL suffix specifies the clear version.

Cross notes that the tape is not widely available, but it is worth finding. 3M lists the tape under marine products.

As a bonus, the tape is also water resistant.

Unusual adapters

When you're working in the field at a remote or sporting event, a compromise must be made between travelling light and bringing enough equipment to get the job done. Everyone has his own bag of tricks to pull from to solve an on-site crisis. For me, it's a bag of adapters. While it's mostly audio connectors, I have some RF, telco and a few other items so I can convert to and from almost anything.

Some of my adapters are custom made, such as an RJ-11 to XLR male and RJ-11 to XLR female. I'm rarely short of mic cables, so I have used these adapters quite often to extend a POTS line as needed. Another useful variation could be an RJ-45 break out box so a single Ethernet cable could be pressed into multipurpose use.

I have also made some adapters that worked perfectly for my need but are never left lying around. On one occasion I made a set of on-site speaker cable adapters to use an electrical extension cord. These obviously did not meet any electrical codes, but for the one time I needed them, having a pair of speaker-to-ac-outlet adapters allowed me to use regular extension cords to quickly place a speaker where it was needed. Once the remote was finished, I disassembled the adapter to prevent any misuse.

Another alternative to adapters is to collect a batch of solderless connectors. It's easy to find these in XLR, TRS, DB, RJ-XX and many other types. These are handy for a last-minute repairs or to make an unusual adapter.

What's in your bag of tricks to save a remote broadcast?

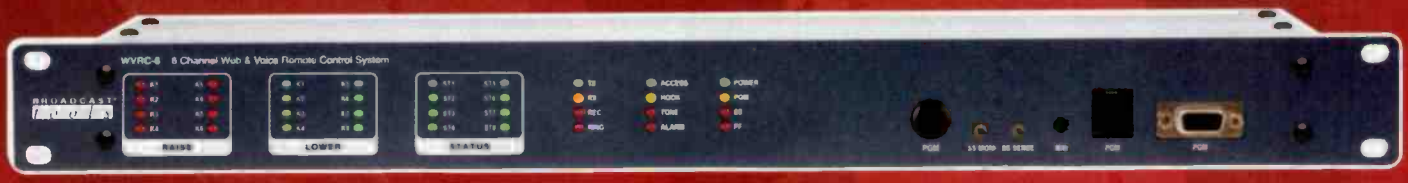
Tell us at Radio@RadioMagOnline.com

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

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

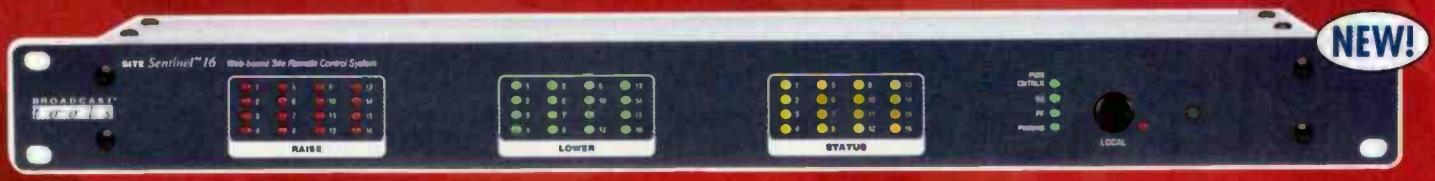
INNOVATIVE PROBLEM SOLVING TOOLS FOR BROADCAST

Site Control



WVRC-8 WEB and Voice Dial-up Remote Control

The WVRC-8 provides a cost-effective, one rack-unit solution for web based and/or recordable voice response dial-up transmitter site control. Each analog, status, silence sensor, temperature sensor and power failure input can be configured to dial-out and/or email up to four individual email addresses.



Site *Sentinel*™ *16*

Web-based 16 channel Site Remote Control System.

WVRC-4 WEB and Voice Dial-up Remote Control

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

Site *Sentinel*™ *4*

Web-based Four channel Site Remote Control System.

I/O *Sentinel*™ *4*

Web-enabled four logic/status input, four relay output module

Relay *Sentinel*™

Web-based Three-relay Module

Schedule *Sentinel*™

Web-based Event Scheduler

Status *Sentinel*™ *16*

Web-enabled 16-input status/logic module

Status *Sentinel*™

Web-enabled Three-input Status/Logic Module

Relay *Sentinel*™ *16*

Web-enabled sixteen open collector/SS relay module

VAD-2 Plus Voice Alarm Dialer

The tinyTOOLS VAD-2 Plus is a user programmable dual status input multi-number voice/pager auto dialer with integrated stereo silence sensor, temperature sensor and power failure port designed for dial out paging and/or voice message notification.

AUDIO *Sentinel*™

The Audio Sentinel™ is a web based dual channel stereo silence monitor combined with a transparent, integrated audio switcher. Designed to monitor two balanced or unbalanced independent stereo analog audio sources.

USA Proud

BROADCAST tools

www.broadcasttools.com

Neogroupe Neoscreener

By Jeff Smith CSRE, CBNT

Call screening software may not be one of the first items you think of when building or rehabbing a studio but it can play a very large role when done right. The French company Neogroupe has done exactly that with its Neoscreener software. Neoscreener goes far beyond what typical call screener software has ever done. In the past software has shown caller ID info and allowed a screener to display caller info on screen for the talent but that is where it all ended. Older software did not allow for talent to easily configure the display to show only the information they needed, did not allow for user configurable databases that retain all kinds of information and in many cases was not too stable.

Neoscreener is one piece of a software suite from Neogroupe that includes also Neowinners and Neoagent. Neoscreener is the call screening software, Neowinners handles everything for promotions and Neoagent lets the outer world (text, e-mails, Iphone apps, websites, etc.) communicate with the suite.

Performance at a glance

Unique view for talent

Displays text, SMS and e-mail messages

Caller ID recognition on ISDN and on POTS

Interfaces with Telos 2x12, Nx12 and 210

Touchscreen-capable interface

Chat function

Automated call logging

Neoscreener works with Telos 2101, Nx12 and 2x12 systems It is also fully able to speak to other phone systems that use the TAPI standard for communication. Upon launching the software for the first time, the user is prompted to go to the configuration screen. In this screen there is a wealth of options to configure the software to work exactly how you need it. It can be configured to handle 12 or 24 lines, and the user can configure what information is saved to the database.

In addition to the screen that a call screener would see that allows for the inputting of all the caller information, there is also a talent screen. The talent screen is user configurable to show only the information the talent wants to see. This makes for a far less distracting screen and is much easier to read.

Go to the phones

When a call comes in, the ringing line flashes on the call screener screen, the call screener would then click on the call button next to the ringing line and a caller card would pop up. Here is where information such as the caller's name, city and topic are input. If the caller has called before from the same number, the caller card will prepopulate the caller name and city fields. This is a great time saver and is also a great way to track certain callers, because notes can be input in the caller screen to be retrieved every time the caller calls. Once the card is closed the caller is placed on hold and in the ready position. This is when the information is sent to the talent screen for the on-air personality to see.

Because it is database driven, Neoscreener can run reports to track calls, see what topics bring the highest call volume and track calls by area code or any other demographic recorded.

Neoscreener also integrates with other Neo software to expand its abilities. The Neoagent software is a helpful plug in that displays all text,

SMS and website e-mails on the call screener screen. This allows the jock to have only one place to look for all the information he needs from listeners. This option is really a jock favorite.

Another part of the Neo software suite is Neowinners. This software allows for full integration of the promotions database with the callers database. This allows for much easier tracking of winners and can really help jocks prevent prize hogs from winning. Because it integrates with Neoscreener, if someone has won before and falls within the limits setup by the stations the jock will be warned when that phone number comes up on the screen.

The other nice thing about Neogroupe, as a company, from an engineering standpoint is how responsive it is. This is a company that understands broadcasting and is willing to adapt its product to fit a user's needs. The company has installations in most European countries, Asia and North America.

Neoscreener has been in use at the Clear Channel Radio New York facility for almost two years now, and I cannot imagine some of our caller-intensive shows living without it. It has truly made the life of our call screeners easier, and our talent really like the talent screen view of Neoscreener. Neogroupe came through for us on very short notice and delivered a great product. I have recommended the company to several other New York City broadcast engineers, and Neo has now been installed at several stations in NYC. Neoscreener and the other software from Neogroupe are really worth the investment if you have a caller-intensive station.

Neo Groupe

P 210-757-4700

W www.neogroupe.com

E info@neogroupe.com

Smith is supervisor broadcast/studio systems at Clear Channel Radio New York City.

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.

Neoscreener

***THE* call management software for radio and TV.**

Our clients include:

- The Glenn Beck show
- Howard Stern
- WOR
- Univision (Luis Jimenez show)
- Z-100

Stabile, reliable, and user friendly call screener software allows talk show hosts to focus on what they do best....*talk.*

Workflow Software

For more information contact

Neogroupe USA
1-603-203-1331
Bretton Woods, NH

NeoGroupe

info@neogroupe.com
www.neogroupe.com

THE FUTURE OF RADIO HAS ARRIVED. THIS IS ITS CARD.

HD Radio

mp3 MRX R·D·S

Meet the ASI8914 PCI tuner adapter with HD Radio™ technology. Receive and record four different digital HD Radio™ channels from a single antenna input. Record in PCM, MPEG-1 Layer 2 and MP3. Each tuner can decode and stream the HD Radio™ Program Associated Data (PAD) data and RDS/RBDS data for analog FM. HD Radio™ multi-cast is supported, allowing the audio and PAD stream to be switched between the Main Program Service (MPS) and Secondary Program Services (SPS) under software control. Are you ready for the future of radio? The ASI8914 is ready for you. For information, call **+1-302-324-5333** or email us at **salesasi@audioscience.com.**

- Up to 4 channels of HD Radio™ audio/data capture
- MRX technology for independent sample rates (8 - 48Hz) for each stream
- Up to 8 cards in one system
- Windows XP/Server 2003/Windows 7 and Linux software drivers available

HD Radio™ is a proprietary trademark of iBiquity Digital Corp.

BUILT FOR BROADCAST www.audioscience.com AUDIOSCIENCE

by Erin Shipps, associate editor

Recording pack
Samson Technologies

Q2U: A dynamic handheld microphone, the Q2U features both an XLR output and a USB I/O allowing it to be plugged directly into a live sound console or any computer with a USB input. The microphone's on/off switch controls the XLR output, allowing anyone to perform in a live setting and record to a nearby computer or laptop simultaneously. It also features a built-in 3.5mm stereo headphone jack output with volume control for no-latency monitoring during recording. Plus, a cardioid pickup pattern and a high-quality A/D converter with a 16-bit, 48kHz sampling rate ensure the sound reproduction in both live and recording applications is clear, detailed and accurate.

631-784-2200; www.samsontech.com
info@samsontech.com

XLR cable connector
Neutrik

XX-HD Series: The XX-HD Series is a heavy-duty XLR cable connector designed specifically for outdoor use. Equipped with hybrid metal/rubber design, the new XX-HD Series is both dust and water protected, meeting the requirements of an IP67 rating, by mating it with the related XX-HD cable connector or Neutrik's MPR-HD chassis connector. The Series includes a 3-pole female XLR connector with optional black housing as well as a 3-pole male XLR connector with optional black housing. The XX-HD connector features a rubber sealing jacket assembled during the termination of the connector that provides dust and water protection, meeting an IP67 rating requirement.

732-901-9488; www.neutrik.com
info@neutrikusa.com

Directional power sensor
Bird Technologies Group

DPS Series: The Bird Directional Power Sensor features a dual-socket, Thruline sensor. A wide range of Bird Elements can be selected to tailor the unit to specific needs over a wide range of frequencies and power levels. Also, select field changeable input and output RF connectors from dozens of types including N, BNC, HN and 7/16 DIN. The DPS measures true average power and/or peak power with exceptional accuracy that is traceable to National Institute of Standards and Technology (NIST). Operate your sensor with either Bird's handheld display, the 5000-XT, or via a computer with our windows compatible software tool the VPM2.

866-695-4569; www.bird-technologies.com; sales@bird-technologies.com

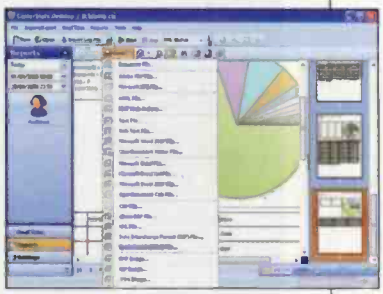
Audio processor
Audemat

Silver 4B Mini AM: Audemat' Silver 4B Mini AM audio processor, just like the 4Bmini FM, offers a big sound at a small price. Easy setup with simple front panel controls and lots of factory presets sound great in minutes. The Silver 4B Mini AM has lots of high-end features, like distortion controlled clipping, remote access via TCP/IP, an on-board scheduler for preset changes.

305-249-3110; www.audemat.com
contact@audemat.com

Audience report generation
Casterstats

Casterstats V1: Casterstats V1 is a free desktop application that generates detailed audience reports based on streaming server log files. Broadcasters will be able to access both real-time and historical reporting at the click of a button, even if they use a third party stream host. They can also instantly generate reports on the number of listeners they can also access information about where their listeners are located.



+32 85 25 20 17; www.casterstats.com
pmengal@casterstats.com

NEW PRODUCTS

300W FM transmitter
Tugicom RF Design

DCE300: This FM radio transmitter features an improved stereo encoder that uses DSP technology with oversampling to ensure performance with low distortion, accurate channel separation and stable pilot tone. An external MPX generator and external RDS/SCA generator or audio processor can be connected to the MPX BNC connector to bypass all internal audio chains. The amplifier has temperature and SWR protections, and low-pass filter built in.

+972-9-8615533; www.tugicom.com; info@tugicom.com

AES/EBU digital audio splitter
Ocean Matrix

OMX-DAY-MBX: OMX-DAY-MBX is a rugged 1x2 digital audio distribution amplifier/splitter for a very cost effective means to split digital AES3 signals. It is good for split to monitor applications and is passive yet delivers professional quality using high performance digital audio coupling transformers. It is fitted with three-pin XLR connectors.

www.markertek.com

broadcast gear from people you trust

BSW

Lowest Prices and Largest Inventory on EVERYTHING For Broadcast

BSWUSA.COM 800-426-8434

Surge protector panel
L-com Global Connectivity

RMSP-CAT6-4: L-com has developed a 1RU patch panel with four CAT-5E/6 Ethernet surge protector modules to protect telecommunications equipment. The RMSP-CAT6-4 employs ultra-low capacitance semiconductors ensuring superior high frequency response and improved return loss for the four data pairs on each line under surge protection. The easily replaceable modules allow easy field repair in the event of a catastrophic surge event. The unit is 802.3af Power over Ethernet (PoE) compatible for normal or reverse polarity systems and can be used with 10/100/1000 attached devices such as switches, routers, access points, IP surveillance cameras, and IP phones.

800-341-5266; www.l-com.com; sales@L-com.com

Soundproof Windows

Studio Window Max: Studio windows consist of two independent fixed windows on each side of the window opening: one vertical and the second vertical or slanted. Windows tested in a 10.5" wall with the window slanted back 5" achieved an STC of 61. For the 8" wall with a setback of 3" it also got an STC value of 61. The window angle is easily adjusted during the installation. With both windows mounted vertically, STC values of 61 to 62 were achived. Two sliding windows allow opening between two rooms and have more personable direct discussions. All windows and doors use laminated glass that is not dual pane. Dual pane glass is never a good noise reduction glass configuration.

877-438-7843; www.soundproofwindows.com; sales@soundproofwindows.com

29,641 products in stock at press time!

The 2010 BSW Catalog Is In Your Mailbox!

It's Our Best Ever, Filled With All The Latest Broadcast Gear at the BEST Prices!

Brand New at bswusa.com!

Get Quotes, Quick & Easy!

At www.bswusa.com, every product has a convenient "Add it to a quote" button. When done building your quote, simply submit it and we'll be back to you with the best prices and delivery in the industry. It's THAT easy!

broadcast gear from people you trust

BSW

Broadcast Supply Worldwide

Knowledgeable Sales Staff

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

Gooseneck lamps
Hosa Technology

LTE-503XLR4, LTE519X-LR4: With the addition of these two 4-pin XLR male-equipped models, the Hosa-Lite product line now encompasses 15" and 18" gooseneck lamps with BNC, XLR3M and XLR4M connectors designed to fit most mixing consoles. These lamps feature four white LEDs and two red LEDs for accurate color illumination. The Hosa-Lite lamps are highly efficient providing more light while requiring less energy. As an LED lighting solution, the Hosa-Lite operates at cool temperatures. Further, these models comply with all International lighting and energy regulations.

714-736-9270; www.hosatech.com
lee@hosatech.com

24-track recorder
Joe Co

Capturing Performance Blackbox Recorder: The Blackbox recorder is a complete digital audio workstation for live venues. It plugs into any standard live mixing console via the normal insert points and will record sound checks. The recorder provides 24 tracks of audio recording directly onto a removable USB2 disk drive that can be immediately plugged into a digital audio workstation. Recording the audio at up to 96kHz and at 24-bit resolution into standard BWAV files on a standard FAT32 formatted drive allows the user to replay the material on any workstation.

+44 1223 911 000
www.capturingperformance.com
info@joeco.co.uk

BSI

SkimmerPlus

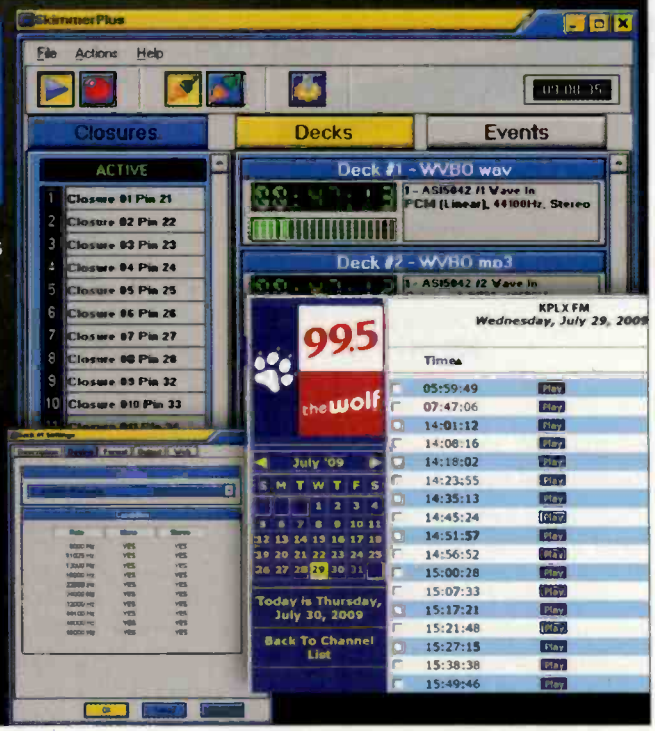
Skimming, Logging and Air Checks with ease.

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

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

www.bsiusa.com

For More Information Call: 1-888-ESI-USA-1 ~ Email: sales@bsiusa.com



Laptop holder
Quik Lok

LPH-003: This free-standing tripod base laptop holder can accommodate virtually any size laptop. Four stoppers, adjustable in width and depth, will securely anchor a laptop, without interfering with input/output ports, expansion slots, CD-RW/DVD drivers or ac adapter sockets placed on either side of the laptop. The laptop tray is height and tilt adjustable and swivels 360 degrees. It is also equipped with a pull-out mouse tray that can be positioned on either the right or left side of the laptop, and is retractable for easy storage and transport.

800-431-6699; www.quiklok.com

Production mixer
Sound Devices

552: Ideal for both simple applications and in complex multi-input/multi-output production setups, the 552 is designed specifically for professional sound engineers. It contains five precision, high-dynamic range, transformer-balanced microphone inputs with expanded gain and headroom. The studio-grade inputs have their own limiter, sweepable high-pass filter and pre- or post-fade direct output. At the heart of each microphone input lies a high-performance Lundahl input transformer, which provides freedom from interference in even the most severe RF and EMI environments that are encountered in the field. Additionally, it has an integrated two-track, 24-bit digital audio recorder that writes broadcast WAV files or MP3 files to SD and SDHC media. The recorder is ideal for applications where a high-quality, 24-bit local recording is required. Either the outputs or combinations of inputs and outputs can be assigned as record sources.

608-524-0625; www.sounddevices.com; info@sounddevices.com

www.rfspecialties.com

RF Specialties Group

Serving Broadcasters For 27 YEARS

EVERYTHING From Here To Here

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
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

Over 400 years of combined broadcast experience ready and willing to help you!

Interactive controller
Novation Music

Launchpad: Launchpad is a compact controller designed to give electronic music makers the most interactive experience possible in Ableton Live. It communicates bi-directionally with the software to give users real-time session feedback. It has been jointly designed by Novation and Ableton, to bring the features of Live to the fingertips of the modern musician. The 8x8 grid of backlit buttons addresses a multitude of functions, with the help of mode selectors that transport the user around the Live interface. Flip from launching clips to tweaking mixer settings in a stroke. The device itself is bus-powered from a single USB connection, and has a 10" square desktop footprint.

+44 1494 462246; us.novationmusic.com
sales@novationmusic.com

Low-power FM transmitters
Nautel

VS Series: The VS Series of low power FM transmitters – using only 2, 3 or 4RU including the exciter – brings Nautel's transmission performance to broadcasters operating on 300, 1000 or 2500W. In addition to the products' rugged engineering, the Nautel VS Series is the first in the industry to incorporate Internet audio I/O and Axia Livewire support in radio transmitters. Customers using the Axia Livewire protocol will be able to connect their livewire networks directly to a VS Series transmitter with a single RJ-45 cable; no intermediary connections or D/A conversions will be needed.

207-947-8200; www.nautel.com
info@nautel.com

UPGRADES and UPDATES

V-Soft Communications has updated FM Commander to 6.3.0.48. The new release includes the capability of providing the graphics included in the latest U.S. Census Tiger data release. (www.v-soft.com)...**Comrex** is making the software required to run its BRIC TS server available to end users. BRIC TS users may continue to use the server maintained by Comrex, but now have the option to build their own. (www.comrex.com)...**Audiofile Engineering** has released version 1.3 of Iphone field recording app called Fire. This version incorporates many new features including audio effects powered by Izotope. (www.audiofile-engineering.com, www.izotope.com) ■

Mobile recording and production studio
Steinberg

CI2: The CI2 advanced integration USB studio houses hardware and software functions. The two-channel XLR combo interface is equipped with two microphone preamps and +48V phantom power, and interactive recording functionality allows hands-free recording with the optional footswitch and the optional mic stand adapter. The controller section features the AI Knob that provides control with seamless integration into Cubase.

818-998-4033; www.steinberg.net
info@steinberg.net

Uninteruptible power supply
Middle Atlantic Products

UPS: The new UPS from Middle Atlantic Products is designed to provide uninterrupted power where uptime is critical. Featuring a 4ms transfer time that prevents system disruptions and equipment lockup, the UPS incorporates high-capacity, heavy-duty batteries for longer runtimes. An easy-to-install sliding rear rackrail mount with 4-point support allows single-person UPS mounting capability. Expansion battery pack options are available for extreme backup runtime requirements, while eight surge-protected outlets protect connected equipment from damaging surges and spikes. The UL-listed UPS is available in 15 and 20 amp configurations in a rackmount chassis only 18.9" deep. Its intuitive power management software provides system status notification and automatic system shutdown as required.

973-839-1011; www.middleatlantic.com
sales@middleatlantic.com

Video enhancement software
Motion DSP

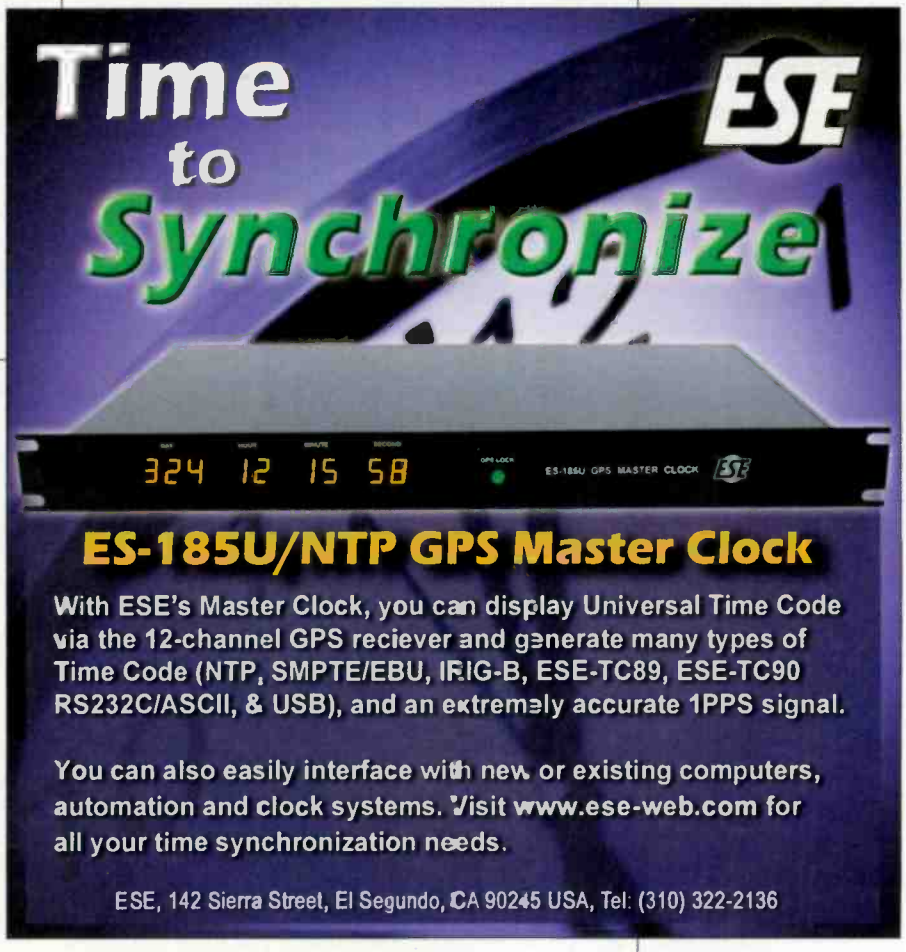
V Reveal: V Reveal fixes common video problems and offers enhancement features including increased resolution, reduced noise and stabilization. It runs on CPU-only systems, automatically locates all the videos on your PC and presents them in a single gallery, plays video files, features simple editing and sharing capabilities. It can import AVI, MPG, ASF and WMV files. With Quick Time installed, it can also play MOV, MPEG4 and 3GP files. Minimum requirements include Windows XP or Vista, Intel or AMD 1.6GHz CPU, 1GB RAM and 50MB hard drive space.

650-288-1164
www.vreveal.com

Rack cases
Gator Cases

G-Pro Series: Gator has unveiled a new line of rotationally molded polyethylene rack cases with 19" rackable depth. These brawny roto molded cases come with recessed Penn Elcom twist latches, front and rear removable lids, and molded-in ergonomic side carry handles. The G-Pro Series is engineered with interlocking tops and bottoms allowing secure stackability. All cases include heat treated 10/32 screws with protective washers and a free rack rail offer. Cases are available in a wide range of sizes such as 2, 4, 6, 8, 10 and 12RU.

813-221-4191; www.gatorcases.com
sales@gatorcases.com



Broadcast mixer
Sonifex

S1: The Sonifex S1 mixer is a high performance compact, low-cost, fixed format mixing console designed for on-air radio use. It can be fitted flush into a desktop or rack mounted by the addition of rack ears. It has 10 dual input channels consisting of four mono mic/line inputs, one telco/line input, one stereo cleanfeed/stereo line input, three dual stereo line inputs and one dual digital stereo input channel. There is also a 3.5mm insert jack socket for an Ipod/MP3 player auxiliary connection. The S1 has one stereo program output available as both balanced analog and AES/EBU or S/PDIF digital, so that a main program feed can be sent to a transmitter while a digital feed can go directly to a PC for internet streaming.

+44 1933 650 700; www.sonifex.co.uk
sales@sonifex.co.uk

Power conditioner
Furman Sound

P-2400 IT: The flagship product of Furman's new Prestige Series, the P-2400 IT is a 20A rack-mountable symmetrically balanced power conditioner, providing ac noise reduction and 100 percent isolation from the power grid for the lowest noise floor possible. It features more than 80dB of common-mode and more than 50dB of differential-mode noise reduction for recording, mastering and broadcast studios. The P-2400 IT provides Furman's SMP/LiFT/EVS Technologies for professional-level protection and linear noise filtration, as well as a switchable front-panel digital voltmeter/ammeter with color-coded voltage range indicator for comprehensive power monitoring, and a front-panel USB charger for personal media devices and cell phones.

707-763-1010
www.furmansound.com
info@furmansound.com

Advanced Wattchman Monitor®/Alarm

For Analog and Digital Broadcasting

The Model 81094 is the first in a series of Internet/Intranet accesible 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 • www.coaxial.com

Monitoring systems
Netia Digital Audio

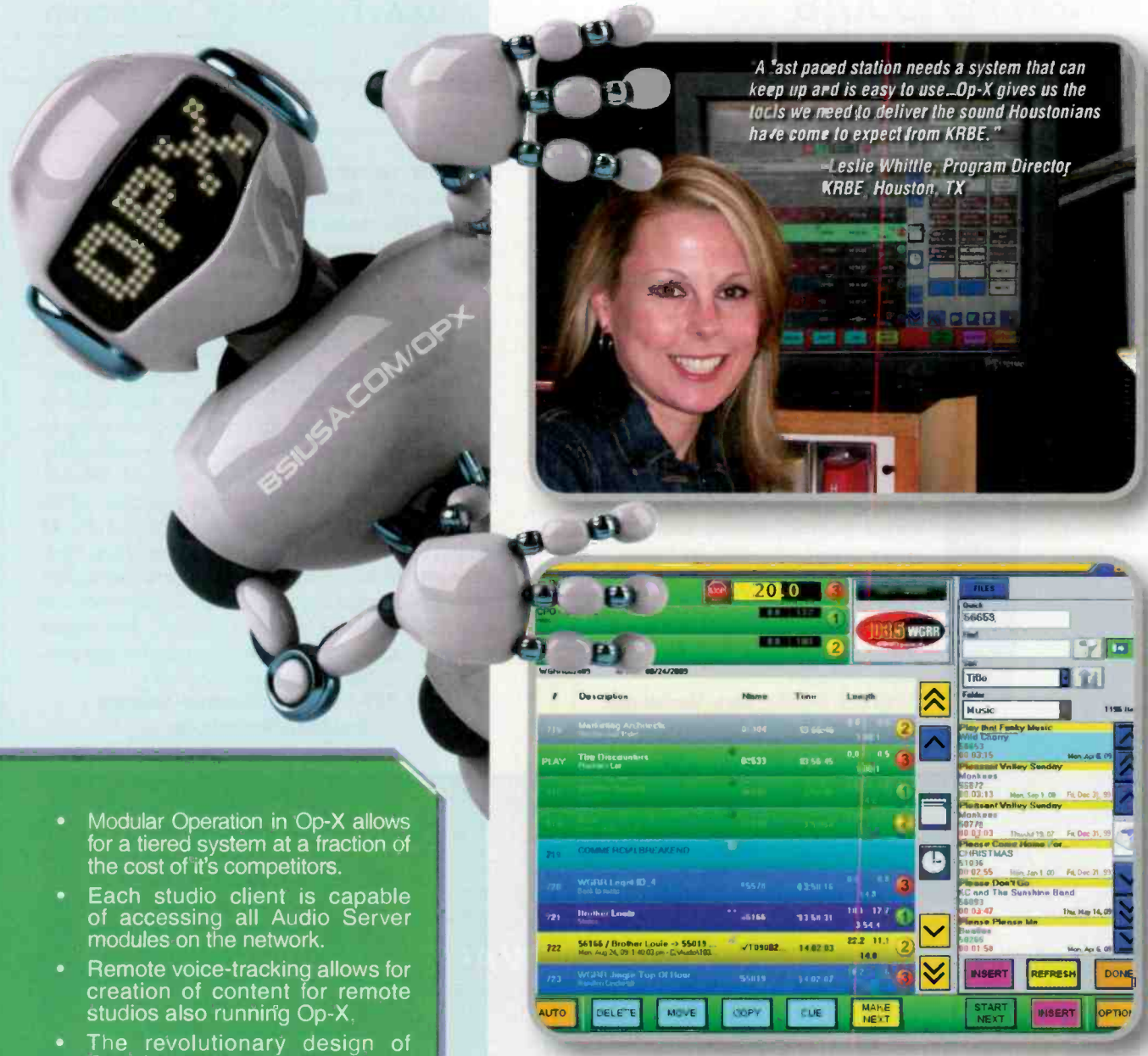
Media Logging: The Media Logging range meets the increased worldwide demand for radio monitoring systems by carrying out the capture, indexing, transcoding and distribution of audio. Broadcasters use Media Logging for continuous capture of audio files, 24 hours a day. Each file is examined individually, segmented and completed with the necessary associated metadata – in an automatic or semi-automatic mode – through the use of sophisticated new speech-to-text and image recognition techniques.

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

Analog mixer line
Tascam

M-164 Series: The M-164 is a 16-channel mixer with six mic inputs, great-sounding EQ and a built-in meter bridge. It adds digital effects like reverb, delay and chorus without adding external processing. The M-164UF is the first compact mixer with a built-in USB 2.0 to deliver all 16 outputs to a computer for live or studio recording.

323-726-0303; www.tascam.com; tascamlit@tascam.com



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

Op-X
RADIO AUTOMATION

AUTOMATION

SIMPLE • POWERFUL • REDUNDANT

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

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

Dynamic microphones
Blue Microphones

Encore Series: The Encore 100, 200 and 300 models are designed for any live application, from the rehearsal space and coffee shop to the auditorium and stadium. The 100 is a studio-grade dynamic microphone. The 200 adds Blue's Active Dynamic circuitry and output transformer, coupling the ruggedness and high SPL handling of a dynamic mic with the consistency and low noise of a phantom powered mic. The 300 is the flagship of the series and offers vocalists uncompromised performance featuring a hand-selected Blue Aria condenser capsule with a matched pre-amp and phantom power circuit, a tuned enclosure, and Blue's proprietary reinforced chassis, which controls airflow around the capsule for unparalleled vocal control and a natural, open sound, no matter how the artist holds the microphone.

818-879-5200; www.bluemic.com

Power meter
Kathrein, Scala Division

3024: With measuring capability from 1W to 1mW, the 3024 presents an ideal upgrade for existing directional coupler-based RF measuring transmitter power monitors, providing PC and Internet access and SNMP network connectivity. It will work with most existing directional couplers, eliminating the need to install new line sections. Internal user-programmable software calculates the display power depending on the probe input, offset, gain and the given value of the directional coupler. Since the setup for each probe in the system is unique, it will even work with different brands of directional couplers. The working end of the rack-mounted 19" 3024 is in the rear, where up to eight probes can be connected for simultaneous power measurements. Multiple combinations of directional couplers and compensated probes produce a matrix that will give readings with ±5 percent accuracy. Both digital and optocoupler ports provide 16 software-assignable relay-type contact closure outputs for alerts.

541-779-6500; www.kathrein-scala.com
broadcast@kathrein.com

STEREO HEADPHONE AMPLIFIER

Shown in AFM-DC1N tabletop chassis

THE ALL NEW AF-SH1 FEATURES:

- Integral Long-Life VCA Stereo Level Control
- Balanced or Unbalanced Inputs
- Switch-Selectable Input Sensitivity
- Switch-Selectable Mono (Left) or Stereo Operation
- Amplifier To Drive High or Low Impedance Headsets
- Convenience of APPFLEX™ Mounting Possibilities

The AF-SH1 is part of the group of versatile APPFLEX products from Radio Design Labs. These modules combine advanced circuitry, durable all-metal construction, attractive RDL U_TRASTYLE™ colors and versatile mounting possibilities. APPFLEX modules are ready to drop in a cabinet, chassis or panel cutout. Numerous ULTRASTYLE wall mounting accessories and tabletop chassis are optionally available to facilitate system design.

SYSTEMS SOLUTIONS www.rdlnet.com RDL • 659 N. 6th Street • Prescott, AZ • 86301 RDL Radio Design Labs

Pinching shouldn't be painful.

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

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

Realize the savings you can put in your pocket.

Call, click, or stop by Progressive Concepts today!

THE BEST IN BROADCAST ELECTRONICS SINCE 1990

progressive concepts
305 South Bartlett Road • Streamwood, IL 60107

www.progressive-concepts.com
(630) 736-9822

TORPEY TIME...
The Good Time People!

Dixon Systems Inc.
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	2001	BE FM2-C, solid state
2 KW	2005	Harris Z2, solid-state
5 KW	1989	Harris FM5K1
5 KW	1991	Harris HT5
7+3.5 KW	2004	BE FMi703, FM & HD, solid-state
10 KW	2004	BE FM10S, solid state
10 KW	1995	Harris HT10
14+5 KW	2005	BE Fmi1405 (IBOC) HD, solid state
20 KW	2005	BE FM20S, solid state
27.5 KW	1984	Continental 816R-4B, solid state IPA
27.5 KW	1999	Continental 816R-4C, solid state IPA
35 KW	1986	BE FM35A

USED AM TRANSMITTERS

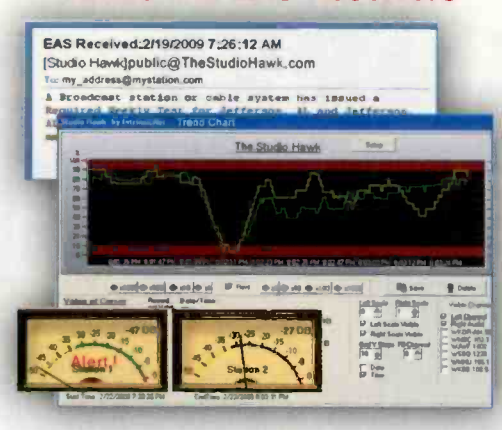
5 KW	1982	Harris MW5A
5 KW	1987	Harris MW5B
5 KW	2002	Nautel ND5, solid state
50 KW	1986	Nautel Ampfet 50, solid state

EXCITERS
New 30 W synthesized exciters
Used Harris 2nd Generation Digit Exciter
Used Nautel NE-50 exciter
Used BE Fxi-250, FM & HD

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 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

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



THE STUDIO HAWK

$650

+ **Monitors** 8 status channels, 8 analog channels and 8 relays
+ **Expandable** to 24 channels
+ **Emails** or **text messages** of alarms

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

MOORETRONIX
BROADCAST & INDUSTRIAL ELECTRONICS

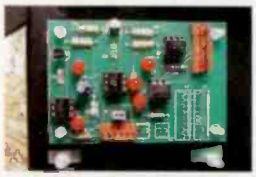
Our 5th Year

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

We Re-Condition

Pacifi 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

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 Sicontroller software that also includes scripting, e-mail alerts, multi-site management, virtual metering & more!

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 Sentinal - Silence Monitor w/Web

Silence Sentinal 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

Coming in the February issue of

Radio
THE RADIO TECHNOLOGY LEADER

- Trends in Technology
  Portable Recorders
- Facility Showcase
  New Digs for WPIG
- Managing Technology
  Radio Apps for Fuel Cells
- Field Reports
  The Samson Q2U is tested
- Insight to IBOC
  Update on the HD Radio EPG
- New Products
  The Latest Technology

DO WE HAVE A FLASHER FOR YOU!
NO, NOT THAT ONE,
THIS ONE!

INTRODUCING THE STUDIO
HOT LINE SERIES

THE FIRST PHONE FLASHER, ALERT AND DOOR INDICATOR SYSTEMS THAT ARE DESIGNED EXCLUSIVELY FOR BROADCASTERS, WITH THE FOLLOWING FEATURES:

* Distinctive color multiple ultra-brite wide angle LED flashers and distinctive audible alerts for both phone, alert or door
* Single line stand-alone units and multi-line systems available with up to 12 lines in and up to 5 display indicator modules
* Audible alerts muted by contact closure or logic low
* Driving voltage output provided for the DME Solid State Relay Pack for lighting incandescent lamps
* Adjustable volume for audible alerts (Off-Low-High)

FOR MORE INFORMATION, PRICING, ETC. ABOUT THESE AND OTHER INNOVATIVE PRODUCTS FOR THE BROADCASTER PLEASE VISIT OUR WEBSITE AT:

WWW.DMENGINEERING.COM
805-987-7881 800-249-0487

BROADCAST MAGNETICS

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

MS

Magnetic Specialties, Inc.
192 Keystone Drive
Telford, PA 18969
Phone: 267-384-5231
Fax: 267-384-5236
Email: info@magspecinc.com

www.magspecinc.com

Transmitting & Audio Tubes
Semiconductors

Taylor
Eimac
Amperex
MA/Com

Immediate Shipment from Stock

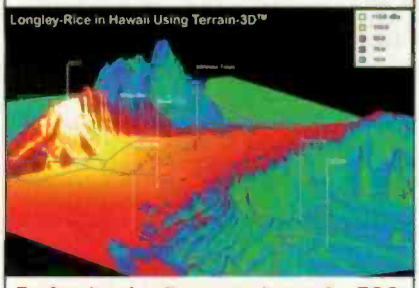
Motorola
Toshiba
Thompson
Mitsubishi

• Se Habla Español • We Export

760-744-0700 • 800-737-2787
Fax: 760-744-1943
www.rfparts.com
E-mail: rfp@rfparts.com

RF PARTS COMPANY

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™

VSoft COMMUNICATIONS®
U.S. Communications Software and Engineering Consulting

The leader in broadcast engineering consulting software.

www.v-soft.com 800 743-3684

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
RAMSEY ELECTRONICS, LLC
590 Fishers Station Drive, Victor, NY 14564
800-446-2295 • 585-924-4560
www.ramseybroadcast.com

www.michaelpatton.com

ENJOY THE SOUND.
MPA

Michael Patton & Associates

Repair/retune service - in house:
- Harris MW- & SX- series modules
- Solid-state FM IPA module "bricks"
- Exciters, STLs, audio processors, etc.

Expert AM/FM Transmitter Work:
- All makes & models, old and new
- Repair, rebuild & retune
- In-house or at your facility

Baton Rouge, Louisiana
225-752-4189
Licensed--Certified--Insured

CLASSIFIEDS

FOR SALE

To Monitor Or

To Control

That Is The Question

www.remote-outlet.com

Acoustics First®

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

Materials to Control Sound and Eliminate Noise™

http://www.acousticsfirst.com

The Radio Technology Leader is also the Radio Technology Podcast Leader

Access the latest podcasts at RadioMagOnline.com/podcast

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

Radio
THE RADIO TECHNOLOGY LEADER

To start your own FREE subscription, go to

subscribe.RadioMagOnline.com?tc=nn6007

and complete the online form TODAY!

Radio
THE RADIO TECHNOLOGY LEADER

www.RadioMagOnline.com • radio@penton.com

Editor – Chriss Scherer, CPBE CBNT, *chriss.scherer@penton.com*
Associate Editor – Erin Shipps, *erin.shipps@penton.com*
Senior Art Director – Michael J. Knust, *mike.knust@penton.com*
Senior Digital Content Specialist – Brad Erpelding, *brad.erpelding@penton.com*

Technical Consultants
contact them via radio@penton.com
Harry C. Martin, *Legal*
Kevin McNamara, CNE, *Computers and Networks*
Mark Krieger, CBT, *IBOC*
Jeremy Ruck, P.E., *RF and Transmission*
Russ Berger, *Broadcast Acoustics*

Contributors
Doug Irwin, CPBE AMD; Chris Wygal, CBRE; John Landry, CSRE; John Battison, P.E.

Group Publisher – Wayne Madden, *wayne.madden@penton.com*
Associate Publisher – Steven Bell, *steven.bell@penton.com*
Marketing Director – Kirby Asplund, *kirby.asplund@penton.com*
Marketing Coordinator – Crystal Shires, *crystal.shires@penton.com*
Vice President of Production – Lisa Parks, *lisa.parks@penton.com*
Senior Director of Production – Curt Pordes, *curt.pordes@penton.com*
Group Production Mgr. – Melissa Langstaff, *melissa.langstaff@penton.com*
Production Coordinator – Steven Kapp, *steven.kapp@penton.com*
Client Services Coordinator – Terra Maples, *terra.maples@penton.com*
Classified Ad Coordinator – Sarah Maxey, *sarah.maxey@penton.com*
Audience Marketing Director – Marie Evans, *marie.evans@penton.com*
Audience Marketing Manager – Kris Cunningham, *kristi.cunningham@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

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

Chief Executive Officer – Sharon Rowlands, *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). To subscribe or change your address, visit: www.radiomagonline.com and click on Subscribe. We can also be reached by email: radio@pbinews.com; Phone: 866-505-7173 or 847-763-9504 or write us at Radio magazine, PO Box 2100, Skokie, IL 60076-7800 USA. Back issues are available for $10 each by calling customer service.

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.

REPRINTS: Contact FosteReprints to purchase quality custom reprints or e-prints 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.

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.

EDITORIAL and BUSINESS OFFICE: Penton Media, Inc. 9800 Metcalf, Overland Park, KS, 66212; 913-341-1300; RadioMagOnline.com, penton.com.

Copyright 2010, 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

Editorial Reprints

Penton Reprints
Phone: 877-763-2303
Website: www.pentonreprints.com
E-mail: diane.mason@penton.com

Sales Offices

Associate Publisher
Steven Bell
Phone: 913-967-7221 · Fax: 913-514-6848
E-mail: steven.bell@penton.com

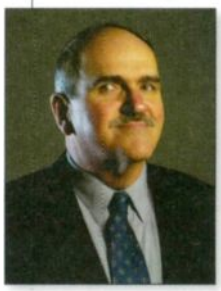
Europe/UK
Richard Woolley
Phone: +44 1295 278 407
Fax: +44 1295 278 408
E-mail: richardwoolley@btclick.com

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: Facility Showcase, page 20



Ron Bartlebaugh, CBNT
Dir. of Broadcast Engineering
The WKSU Stations
Kent State University
Kent, OH

Bartlebaugh has been the director of broadcast engineering for WKSU since 1990. He is a frequent contributor to *Radio* magazine and author of the *SBE Certification Handbook for Radio Operators*. His broadcasting career began in the mid-sixties at a small station in Western Pennsylvania, and he previously served eight years as chief engineer of Moody Broadcasting's WCRF. He also designs professional sound reinforcement systems and manages mysteriously invisible sound waves using precisely designed acoustical techniques.

Radio
THE RADIO TECHNOLOGY LEADER

Written by radio professionals
Written for radio professionals

Radio Volume 16 Number 1 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 ONN6C 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	23	888-765-2900	www.acousticsfirst.com
Arrakis Systems	24-25, 47	970-224-2248	www.arrakis-systems.com
ATI Digital Audio	18	800-959-0307	www.atiaudio.com.com
AudioScience	31	302-324-5333	www.audioscience.com
Broadcast Electronics	27	217-224-9600	www.bdcast.com
Broadcast Software International	34, 39	888-BSIUSA1	www.bsiusa.com
Broadcast Supply Worldwide	33	800-426-8434	www.bswusa.com
Broadcast Tools	29	360-854-9559	www.broadcasttools.com
Circuitwerkes	42	352-335-6555	www.circuitwerkes.com
Coaxial Dynamics	38	440-243-1100	www.coaxial.com
Comrex	8-9	978-784-1717	www.comrex.com
Continental Electronics	19	800-733-5011	www.contelec.com
Dixon Systems	41	800-387-6141	www.dixonsystems.com
DM Engineering	43	800-249-0487	www.dmengineering.com
Enco Systems	1	800-ENCO-SYS	www.enco.com
ESE	37	310-322-2136	www.ese-web.com
iMediaTouch	13	888-665-0501	www.imediatouch.com
Inovonics	23	831-458-0552	www.inovon.com
Logitek	3	800-231-5870	www.logitekaudio.com
Magnetic Specialties	43	267-384-5231	www.magspecinc.com
Mediatron	36	+49-89-371-5645-0	www.mediatron.com
Michael Patton Associates	43	225-752-4189	www.michaelpatton.com
Mooretranix	42	800-300-0733	www.mooretronix.com
Moseley Associates	7, 27	805-968-9621	www.moseleysb.com
Nautel Electronics	15	902-823-2233	www.nautel.com
Neogroupe	31	603-203-1331	www.neogroupe.com
OMB America	17	305-477-0973	www.omb.com
ProAudio	22	800-433-2105	www.proaudio.com
Progressive Concepts	41	630-736-9822	www.progressiveconcepts.com
Radio Design Labs	40	217-352-3498	www.rdlnet.com
Ramsey Electronics	43	800-446-2295	www.ramseybroadcast.com
RF Parts	43	800-737-2787	www.rfparts.com
RF Specialties	35	816-628-5959	www.rfspec.com
Sandies USA	36	215-547-2570	www.sandiesusa.com
SCMS Inc	11	800-438-6040	www.scmsinc.com
The Studio Hawk	42	662-324-2769	www.thestudiohawk.com
TieLine Technology	5	888-211-6989	www.tieline.com
Transcom Corporation	41	800-441-8545	www.fmamtv.com
V-Soft Communications	43	800-743-3684	www.v-soft.com
Wheatstone	2, 48	252-638-7000	www.wheatstone.com
Yellowtec	26	+49-2173-967-315	www.yellowtec.com

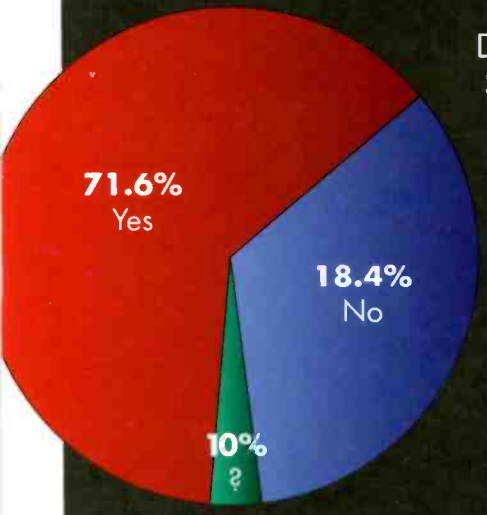
This index is a service to readers. Every effort is made to ensure accuracy, but *Radio* magazine cannot assume responsibility for errors or omissions.

by Erin Shipps, associate editor

Sample and Hold

Thoughts on Audio over IP

In our recent webinar, IP Audio in the Studio, we asked attendees to answer a few questions about AoIP. Here is what they said.

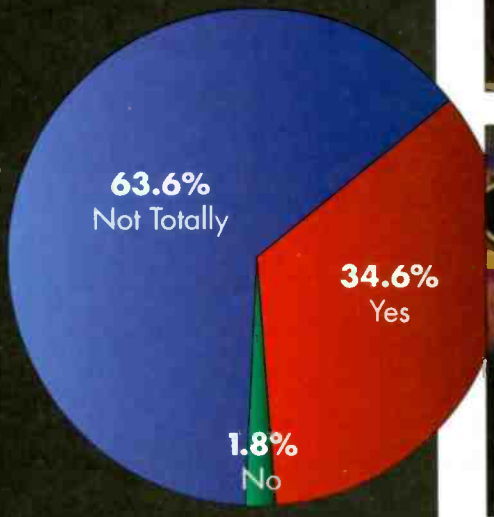


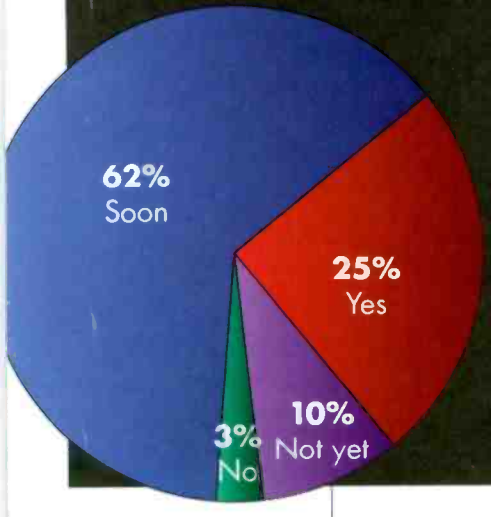
Do you believe an Open Standard is important to the success of AoIP?

71.6% - Yes, IEEE or another standards organization needs to develop one.
18.4% - No, the best technology will reveal itself by market forces.
10% - I thought there already was one.

Do you believe AoIP will become standard for broadcast facilities?

34.6% - Yes, it will replace all other router and console technologies
63.6% - Not totally, what we use today will be around for some time to come.
1.8% - No, it is a "FAD" technology.





Do you or would you install AoIP as it is today?

25% - Yes, already in place
62% - Not yet but soon
10% - Not yet...the technology isn't there yet
3% - No! I would never consider it.

Do you remember?

The movie "Pirate Radio", released in November 2009, follows an illegal radio station in the North Sea in the 1960s. We thought it would be interesting to try and identify the equipment used in the movie. If you spot anything familiar, let us know about it by commenting on this article online. All photos are by Alex Bailey and courtesy Focus Features.

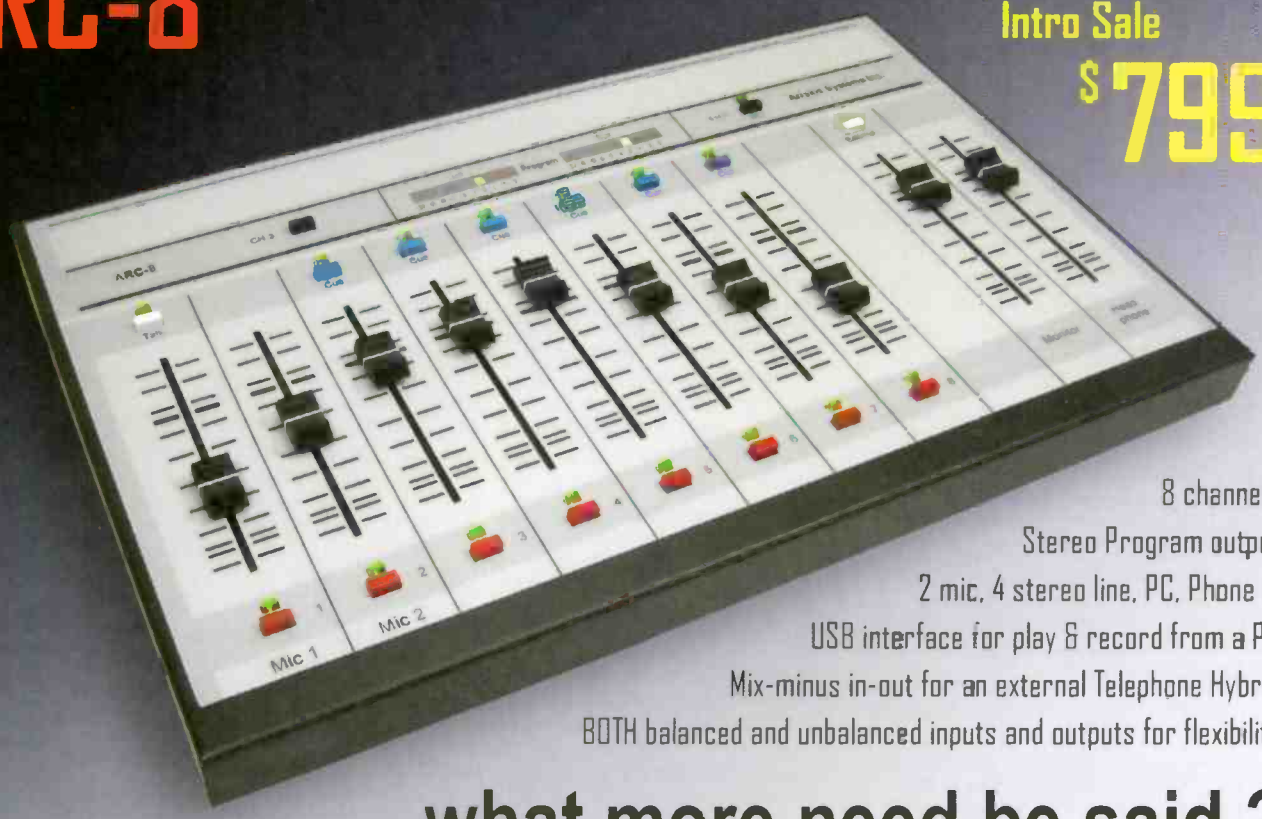
NEW

full featured, professional consoles at amazing prices from ARRAKIS

ARC-8

Intro Sale

$799



8 channels
Stereo Program output
2 mic, 4 stereo line, PC, Phone in
USB interface for play & record from a PC
Mix-minus in-out for an external Telephone Hybrid
BOTH balanced and unbalanced inputs and outputs for flexibility

...what more need be said ?

other members of the ARC family...

Sale

$1,599
ARC-10U

$3,495
ARC-15BP

$5,4
MARC

www.arrakis-systems.com 970.461.0730

FINALLY...FAILSAFE NETWORKED AOIP.

WHEATSTONE E-SERIES & WHEATNET-IP ARE YOUR BEST CHOICE BY A LONG SHOT.

When it comes to networking your facilities, there's only one best choice. Wheatstone. For years, we've been the network/control surface choice of top broadcasters. And with good reason – we care.

Wheatstone's Audio-Over-IP product is the best in the business. Here's why:

1. WheatNet-IP is easiest for a station to implement and configure. It is, hands down,the easiest in the industry. No need for Wheatstone to provide factory on-site assistance unless you really WANT us there. The manual and app notes will have you up, running and stable in less time than any other system.

2. WheatNet-IP is a natural for large facility multi-station networking (and for smaller facilities too!). It uses the IGMP features of Ethernet Layer 3 switches to identify a multicast packet, see which ports are requesting that packet, and send it only to those ports. Traffic control is maintained and system bandwidth is optimized.

3. Redundancy is critical. A typical WheatNet-IP installation has multiple levels of redundancy. Each BLADE holds the complete map of the entire system within its onboard memory – we call it distributed intelligence – a system with 50 BLADEs has 49 backups with failover in the event of a failure. Cisco Stackwise technology provides redundancy in the central core TOC switch. A WheatNet-IP/E-Series console studio complex can stand alone, even if the TOC goes down, with backup analog or digital program audio feeding a back end router independent of the core Gigabit infrastructure.

4. Modular is better. Why would you want to combine your switch, mix engine and I/O into one box? Beats us. With WheatNet-IP, you install only what you need, where you need it. We believe in not overselling.

5. Manufacturing quality is very important. Wheatstone is proud to have the best track record in the business for build-quality, reliability and intelligent functionality. With far more up-and-running installations than anyone else, this is where we really shine. An investment in WheatNet-IP and E-Series control surfaces today will reward you with a future-proof, failsafe networking/control environment that's infinitely updatable and in for the long run.

6. WheatNet-IP has an advantage. Take a look at your entire environment. Wheatstone is a perfect partner because we are always there, always innovating. Built into every WheatNet-IP BLADE are features others just didn't think of – handy utility mixers, silence detection, crosspoint routing control, headphone monitoring of any source, lots of logic GPIO, and comprehensive metering of audio I/O, not just signal-presence indicators. And, in the hugely unlikely event that a BLADE needs to be replaced, you just plug in a new one and enter the BLADE number. That's it.

7. Wheatstone is local. WheatNet-IP and the E-Series, just like ALL Wheatstone products, are designed, engineered and built from start to finish in our New Bern NC USA facility. Everyone who works on our products is 100% knowledgeable and immediately available. You can relax – like the famous insurance company, you actually ARE in good hands.

With WheatNet-IP, we think we've done our homework. In fact, we know we have. And we're happy to say that we've got the best product on the market. To learn more, and there's a LOT more, get us on the phone or visit us on the web. We'll be happy to meet with you and get you everything you need.

Wheatstone

Audio Networking—Simply Evolved

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