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August 2009
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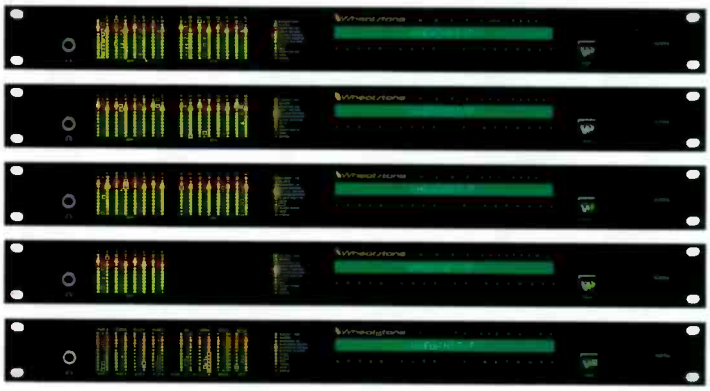
Collision Course

WILQ rebuilds after a joy ride

TRENDS IN TECHNOLOGY
Streaming update

FIELD REPORT
Microgen TS9080

A Penton Media Publication



AUDIO-OVER-IP ROUTING. SOME TECHNICAL STUFF.

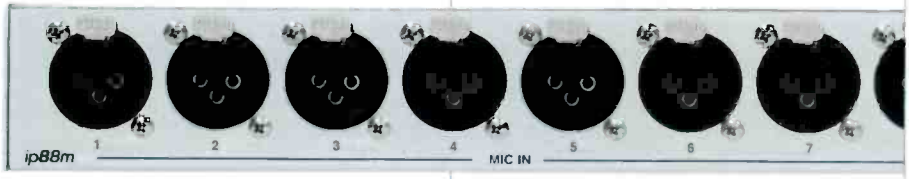
WHEATSTONE and WheatNet®-IP

WheatNet-IP is the new name for Wheatstone's Audio-over-IP networking, routing, and mixing system. First introduced at NAB 2008, it now accounts for the vast majority of networking systems that Wheatstone quotes and installs.

First, a quick overview, and then why WheatNet-IP has been so successful, not only in converting Wheatstone's loyal clients to AoIP, but also in convincing clients of the superiority of Wheatstone's technology over other choices.

WheatNet-IP BLADES

We call our I/O and mixing hardware and software "BLADEs"... way beyond the cutting edge, they're sharp and to the point (and yes, pun intended). Each BLADE is designed for a specific function—we don't cram unrelated tasks into one box making a central point of failure; we all know about "putting all your eggs in one basket."



BLADEs are access points in and out of the network. They interface seamlessly with Wheatstone's Evolution Series Console Control Surfaces, the Glass-E Virtual Console Control Surface, most of the popular automation systems, and streaming audio.

Three BLADES are line level I/O interfaces, one all analog, one all digital, and one half of each. Our newest BLADE provides mic level inputs. A fifth hardware BLADE mixes the audio for a Wheatstone console control surface. Each of the BLADEs and each Wheatstone console control surface connects to the network with a single CAT5E/6 cable.

BLADES are loaded with lots more sharp features: Each includes two 8x2 virtual utility mixers that can be used for a wide range of applications, a front panel headphone jack with source select and level control to monitor any system source, SNMP messaging for alerts, and silence detection on each output that can trigger alarms or make a routing change.

There's also WheatNet-PC, a software BLADE that you install on automation system computers, news workstations, or even the PD and GM's desk computers—to control, play and record audio on and off the network. It eliminates the expensive sound card, and replaces tons of audio and control wiring with a single CAT5E/6 cable.

EASE OF INSTALLATION

The relatively small channel count of each I/O BLADE allows you to conveniently locate it close to your equipment. In TOC/Master Control, there's no need for a back wall full of punch blocks, a BLADE (or occasionally two) in each rack keeps audio and control wiring entirely within the rack, allowing for a fast and clean build-out. In the studio, usually just one line-level BLADE is required; they're silent, so you can locate them with live mics.

FAST AND SIMPLE SETUP

Wheatstone's goal was a system that's extraordinarily easy to implement without the need for super-complicated network engineering, and where you don't need to be concerned about setting priorities to assure that those signals that are most critical are available.

WheatNet-IP setup is easy, intuitive, and takes only a few minutes until you're on the air. The front panel setup wizard in each BLADE gets you up and running in moments. Extensive front panel metering and status indicators provide quick confirmation that all is well. WheatNet-IP's web interface and WheatNet-IP Navigator software let you further customize your system, locally or remotely, with input and output names, logic associations, routing and much more.

RELIABILITY

Audio everywhere all the time, and keeping you on the air, were foremost in the design of WheatNet-IP.

Wheatstone chose Gigabit Ethernet (1000BASE-T) because 100BASE-T just can't simultaneously handle the large number of audio channels prevalent today in large broadcast plants without the very real risk of audio not being available when you need it. Gigabit protocol means all audio everywhere with extremely low latency.

WheatNet-IP is completely self-contained—no PC is required to perform any of the system functions, including routing, mixing, salvos, and logic control. The PC is needed only for configuration changes.

Each BLADE carries a complete map of the entire connected network in its onboard CPU flash RAM. Talk about redundancy, a system with 36 BLADEs has 35 backups! Need to replace a BLADE? Assign its ID number and connect it to the network—it will query the other connected BLADEs and import all the necessary configuration settings!

BLADES

ip88m ANALOG MIC I/O BLADE: 8 fully balanced reference-grade mic preamps with phantom power, 8 analog outputs, 12 universal logic (GPIO) ports programmable as inputs or outputs, routable throughout the system.

LINE LEVEL I/O BLADEs: 16 input channels, 16 output channels (switchable 8 stereo, 16 mono, or any combination), and 12 universal logic (GPIO) ports.

ip88a ANALOG I/O BLADE: 16 analog in/out.

ip88d AES DIGITAL I/O BLADE: 8 AES (16 channels) in/out.

ip88ad ANALOG & DIGITAL I/O BLADE: 8 analog in/out, 4 AES (8 channels) in/out.

ip88e WheatNet-IP MIX ENGINE BLADE: Handles all of the mixes from Wheatstone Evolution Series Console Control Surfaces and the Wheatstone Glass-E Virtual Console Control Surface, distributing the four stereo PGM, four stereo AUX SEND, per-channel MIX-MINUS, monitor outputs and other bus signals to the network. Once on the network, they are available as sources and outputs anywhere. This creates an extremely flexible system, where program outputs from one surface can be a source on any other surface; for example a news mixer's program bus as a source on the air studio surface. While the ip88e doesn't house audio I/O, it does include 12 universal logic (GPIO) ports.

WheatNet-PC BLADE: Installs on Windows PCs to replace the sound card; interfaces eight stereo audio signals in/out, plus automation control data (start, stop, etc.).

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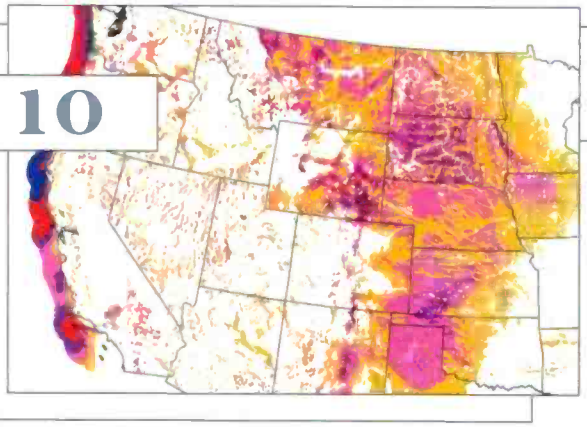

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Features

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ON THE COVER

When joy riders put a log skidder through the front door of WILQ's transmitter site, the station saw it as an opportunity to start from scratch. Cover design by Michael J. Knust.

Tieline IP Audio Codec Solutions

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Currents Online

Selected headlines from the past month.


Kneller

Kneller Joins Nautel

Hal Kneller is the new market development manager. He will manage the introduction of new products as a member of Nautel's sales and support organization.

NABEF to Host Career Day at 2009 NAB Radio Show

Working with the BEA and RTNDA, the event will be held on Sept. 23 at the PA Convention Center.

Dial Global/Triton Radio Networks Names Trautmann EVP Technology

Conrad Trautmann was most recently senior vice president of engineering and IT at Westwood One.

House Committee Requests GAO Study of the Arbitron PPM

House Judiciary Committee Chairman John Conyers leads 10 members of Congress in requesting the study, which he wants complete by April 2010.

HD Radio Electronic Program Guide Project Moves to Field Trial

The Boston test is part of the NAB Fastroad project, which has support from Ibiquity and others.

127th AES to Host SBE Certification Exam Session

As part of its broadcast offerings at its convention, the SBE certification exams are currently slated for Oct. 12.

NAB Sets 2009 NAB Radio Show Engineering Program

Digital radio technology, emergency operations, IP audio and computerized antenna modeling are among the topics.

Site Features

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A renewed FCC

There's a new man at the helm of the FCC. Julius Genachowski assumed his new responsibilities at the end of June. His background has been covered extensively already, but it is worth noting that he has some experience with the FCC: He served as chief counsel to former FCC chairman Reed Hundt. He has also been involved with media and telecommunications in various roles, so at least he joins the agency with some familiarity as to its function.

There have been five FCC chairmen since 1993. With a new guy coming in, I looked back at his predecessors to see what their legacies have been.

Kevin Martin (2005 - 2009): He'll likely be remembered for ignoring procedures and micromanaging the agency.

Michael Powell (2001 - 2005): He was a champion of broadband over power lines. He also created the FCC University.

William Kennard (1997 - 2001): He fought for a competitive marketplace to all consumers. He was the champion of LPFM.

Reed Hundt (1993 - 1997): Under his reign, the FCC conducted the first spectrum auction in U.S. history, raising almost $20 billion in its first two years.

So what's in store for our new chairman?

As I noted earlier, he worked for Reed Hundt, who appears to be the most popular former FCC chairman to date. I still see Hundt's name from time to time, and he's still active in business and telecommunications. Perhaps Genchowski will benefit from the company he kept.

One big stroke in Genachowski's favor is that he replaces Kevin Martin. Martin took the chairman's job with mixed reviews, and had the potential to be a strong chairman, but Martin fell flat. Some would say that anyone would be better than Martin. That's not strong praise for the new guy per se, but it makes it easier when the initial expectations are already very low.

What does Genachowski have to look forward to? The FCC has plenty of pending issues before it.

- *FM translators for AM stations*

Granted, this has been in the works for some time, but it was adopted within moments of Genachowski taking the big chair. He'll probably get the credit in the history books.

- *Fairness Doctrine*

Most of the commissioners are opposed to reinstating it, which is good for broadcasters. Will the issue stick around long enough for their opinion to change?

- *White spaces*

This will be on the FCC's plate for some time because so many people see the supposed white spaces as a wide-open frontier for new uses. Broadcasters know better.

- *Indecency*

This is the topic that never goes away. Because of the topic's sensitive nature, Genachowski could be a hero for resolving it or take some heat for making it worse. It will all depend on how the final solution is played and presented.

- *Satellite radio merger*

There are some requirements that were put in place to allow the merger. The FCC will have to act on these requirements or feel the wrath of the terrestrial broadcasters and the NAB.

- *Migratory birds and towers*

This is yet another topic that has a potentially endless life because of the passionate groups on either side. Again, Genachowski can be hero for finding a solution, or a villain for making it worse. He can't please everyone, but if he can appease most of them he'll do fine.

- *PPM*

I believe Genachowski will keep the FCC out of radio ratings. That's part of the business of radio. I don't see it as a direct part of serving the public interest, but that's the direction some are trying to take it. The Media Ratings Council can and should determine the future of the PPM.

Good luck in your new job, Mr. Genachowski.

Chris Scherer

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

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Alternative power systems

By Kevin McNamara

Whether you are looking for a reliable backup power system or transitioning to a green-friendly facility, the choices for alternative power systems have never been greater. While approaches using the sun, wind, sub-surface heating and water cause no pollution and little-to-no operational expense once installed, they have been relatively costly to deploy. All of the available alternative power systems available, including fossil fueled units, are inefficient in terms of the actual energy expended versus the electricity produced.

According to the U.S. Energy Information Administration (USEIA), the national average cost for utility delivered power in April 2009 is 9.69 cents per kilowatt/hour (kWH) which is higher than the same average of 9.3 cents in April 2008. While this average rate seems reasonable, the state averages range from less than 6 cents (Wyoming) to almost 19 cents (Hawaii.) In general, the states in New England, the Middle Atlantic and Pacific Coast regions pay the highest for electricity.

Cost considerations

It is necessary to understand the associated costs for materials, installation and maintenance for a system that will meet or exceed the requirements of the application. This provides the basis for calculating the return on investment (ROI).

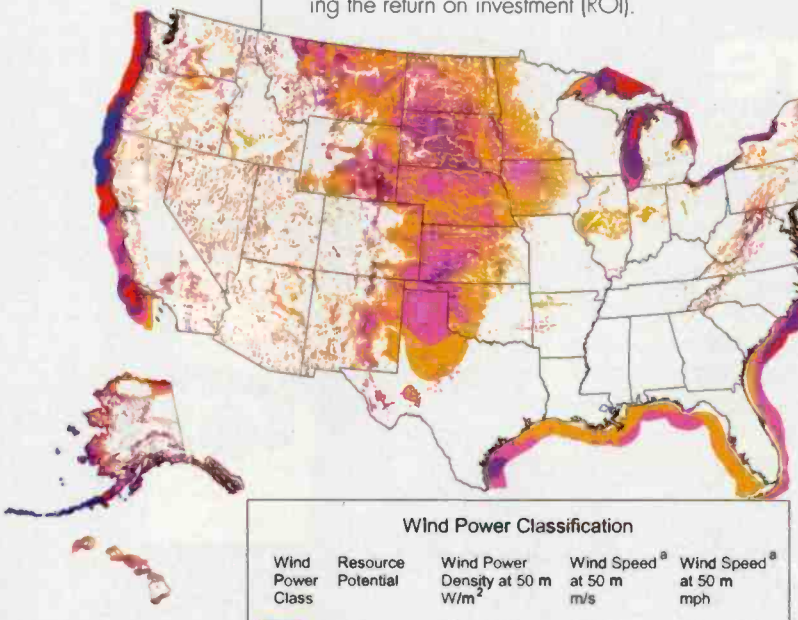
There are several federal and state tax incentives available to both residential and commercial users who invest in alternative power systems. It will also be possible to sell any excess power generated back to the utility, thus creating additional operational revenue to offset the initial investment. This is called the Avoided Rate and can be obtained from your utility provider. For example, the photovoltaic (PV) panels in a solar power system might generate excess load during periods of peak sun exposure that could be sold back to the utility.

To properly calculate the ROI, obtain a copy of the utility bill for the subject facility and determine the cost per kWH charged. In some cases, the bill may show different costs, based on usage rate levels, discounts, etc. If this is the case, average all the kWH rates; this will be the basis used to compare costs.

Next determine the percentage of load the alternative power system is expected to offset from the utility delivered power. In most commercial applications it may not be practical or cost effective to consider these systems to operate 100 percent of a facility; however, it might be sensible for lower power transmitter sites. Calculate the kWH the system will provide annually. These systems will perform differently depending on the method chosen and the specific location in the country they are used. This selection of an alternative power system must take into account the environmental factors that would influence proper operation and maximum efficiency.

Finally, the overall cost of the investment will be different depending on the specific power systems, i.e. expected life span of equipment/batteries, fuel costs (if any), system efficiency, cost per kWH, power output, planned outages. Other considerations include the typical financial calculations associated with capital projects such as depreciation, discount rate, investment tax credits and other government incentives. Once these are factored together you will have the real cost of deploying the system.

After you have established your annualized average utility rate (AVR), power output of the alternative system (PO), percentage of contribution that the alternative power system will provide (PC), any excess capacity that can be sold at the Avoided Rate (AR) and the overall cost of the investment in



Potentially good wind power sites across the U.S.

Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m^2	Wind Speed[a] at 50 m m/s	Wind Speed[a] at 50 m mph
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

[a] Wind speeds are based on a Weibull k value of 2.0

the new power system (OC), the actual cost savings can be computed using: PO x PC x AVR x PO x PC x AR = Actual System Savings. ROI would then equal Actual System Savings / OC.

Alternative power systems

Solar power generation is created through the use of photovoltaic semiconductors that absorb sunlight, subsequently releasing free electrons converted into a usable dc current. Many semiconductors, or solar cells, are installed into a single panel, or module, that supports, protects and electrically combines the cells so they can be installed conveniently. There are several types of manufacturing processes: single-crystal and multi-crystalline are the more traditional methods used over the years, but new processes such as string ribbon silicon and thin-film are easier and cheaper to manufacture and can be made into flexible panels for integration into other materials such as roof tiles for a clean architectural look. The cost of solar panels is dropping significantly and is expected to continue.

Wind power is generated when wind rotates a blade that converts kinetic energy from the wind into mechanical energy. The mechanical energy can be used to power a wide variety of machinery such as a generator, which then provides electrical current. Wind generators should be installed in areas that do not obstruct wind flow, which generally means open land or atop a building as high as possible.

Fuel cells are becoming a popular choice as a backup or in some cases primary power source for communications sites. Fuel cells provide power through an electrochemical reaction using oxygen and a fuel that ultimately yields electricity, water and heat as a byproduct of the electrochemical process. Fuel cells work with a wide variety of fuels but most use hydrogen. Multiple fuel cells or stacks can be combined to achieve high power levels, typically up to 30kW. These systems are eligible for significant tax credits and incentives, have very low operating costs, require minimal space and operate at about 60 percent efficiency.

McNamara is president of Applied Wireless, Cape Coral, FL.

Resources

- ***Average retail electricity prices***
  www.eia.doe.gov/cneaf/electricity/epm/table5_6_a.html
- ***Database of State Incentives for Renewables and Efficiency***
  www.dsireusa.org
- ***Solar Power Calculator***
  www.solarpowerrocks.com
- ***Wind Resource Maps***
  www.windpoweringamerica.gov/wind_maps.asp
- ***Department of Energy Fuel Cells***
  fossil.energy.gov/programs/powersystems/fuelcells

AM stations
authorized to use FM translators

By Harry Martin

The Commission has changed its rules to permit AM stations to rebroadcast their signals on FM translators under certain conditions. The long-awaited rule change opens the door for the expansion of nighttime AM service by daytimers or stations with limited nighttime power. Up to now, the FCC has permitted such operations only under special temporary authorizations.

Under the new rules AM stations may rebroadcast only on "currently authorized" commercial-band FM translators. But no portion of the 60dBu contour of the translator may extend beyond the smaller of the AM's 2mV/m daytime contour or a 25-mile radius from the AM station's transmitter site.

To be a currently authorized translator, the facility must have an FCC license or construction permit issued on or before May 1, 2009. Translators whose initial permits were granted after May 1 will not be eligible. The reason for this restriction is to preserve spectrum for LPFM, which is the subject of a looming proceeding that could make FM translators, at least those authorized after the May 1 cut-off date, secondary to LPFMs. The theory is that once AM stations begin using FM translators the FCC will be hard pressed to recover the spectrum for LPFM use.

Daytime-only AM stations will be allowed to originate programming on FM translators even during time periods when such AM stations would not otherwise be operating. Even though such service is not "rebroadcasting," the Commission viewed it as in keeping with the agency's desire to bolster the competitive position of AM licensees.

Dateline

For noncommercial stations in the following locations only, the biennial ownership report deadline is Oct. 1: Alaska, Florida, Hawaii, Oregon, Puerto Rico, Virgin Islands, Washington and the Pacific Islands.

Oct. 1 is the deadline for radio stations in Alaska, Hawaii, Oregon, Washington and the Pacific Islands with more than 10 full-time employees to electronically file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC.

Oct. 1 is the deadline for radio stations licensed in the following states to place their annual EEO Reports in their public files: Alaska, Florida, Hawaii, Iowa, Missouri, Oregon, Puerto Rico, Virgin Islands, Washington and the Pacific Islands.

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

Court affirms 2007 LPFM technical rules

The U.S. Court of Appeals for the D.C. Circuit has rejected the NAB's challenge to certain LPFM technical rules adopted by the Commission in 2007. In 2007 the FCC:

- Modified its "cease-operation" rule (Section 73.809) to provide that an LPFM station causing interference to a later-authorized/modified full-service station would apply only to co-channel and first-adjacent channel situations, but not second-adjacent situations.
- Established new standards for waiving separation requirements when a later-authorized/modified full service station would ordinarily displace an LPFM but there are no alternate, rule-compliant channels to which the LPFM might relocate.
- Created a "rebuttable non-binding presumption" elevating LPFMs over later-filed full service applications for change of city of license provided the LPFM demonstrates it has "regularly provided at least eight hours per day of locally-originated programming.

Reducing second-adjacent protections appears to be inconsistent with Congress's mandate that third-adjacent protections be maintained. However, third-adjacent channel protections are on the congressional chopping block and could disappear soon. The FCC would like to delay its anticipated LPFM window until that issue is resolved. If both second- and third-adjacent channel protections are removed or reduced, far more new station opportunities would be available through an LPFM window.

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

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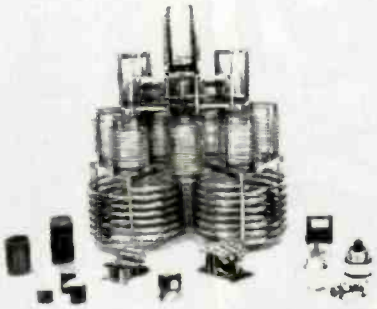

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SINCE 1963

WEB radio

An update on streaming

By Chris Tarr, CBRE CBNT DRB

It was once said that streaming is the future of radio. Well, the future is here.

To the uninitiated, it seems like quite a challenge to get an Internet stream of your station up and running. With questions about royalties, content owners and streaming sponsors out there, you need to do more than just plug your studio into a media encoder.

First, let's look at the stream's building blocks: You obviously have the on-air feed. This is your bread and butter, and your reason for being. You need to feed that at the very minimum.

Next, is the commercial overlay technology. Commercial overlay was created by necessity. Years ago, the voiceover artists and creative houses that produced commercials licensed their work for radio airplay only. They decided early on that if their work was to be streamed over the Internet, they should be compensated for that as well. So in response, several companies came up with the idea to tie an audio encoder to commercial playback systems, enabling the encoder to interrupt the live studio feed with alternate programming. As this system matured, operators realized that this opened up an entirely new revenue stream for the station. What started out as a problem ended up being an opportunity as stations started to sell spots on the Internet stream as well as on the air.

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Then there is the back end, or distribution point. Most broadcast facilities lack the bandwidth to feed audio to thousands of listeners, so it's common to send a single feed to a distribution point that can feed many simultaneous listeners.

Finally, there is the collection of data for song royalty payments. Entities that stream music are required to pay royalties on the basis of number of listeners per song, so you need to know every song that played, and how many people were listening at the time. It's not hard to imagine how difficult it could be to collect all of that data.

These blocks are pretty much the minimum today if you're looking to stream your station.

So, how do you do it?

Help is available

Fortunately, there are several third parties out there tohandle the job. Big players today sell turn-key solutions allowing you to stream, overlay and pay royalties pretty painlessly. On top of that, they also give you the ability to schedule and invoice the overlay spots, and offer options like streaming to Iphones. It makes little sense these days to roll your own system, because these streaming providers have the ability to scale and react to industry changes quickly and inexpensively.

The first step is to do some research on these providers. Listen to the streams of other radio stations. Is the sound quality good? Do the overlays sound natural? Do the players require any special software to work? These are important questions, because listeners have millions of choices for radio on the Web. Nothing will kill your streaming audience faster than bad audio, or a player that crashes their computer or requires special software.

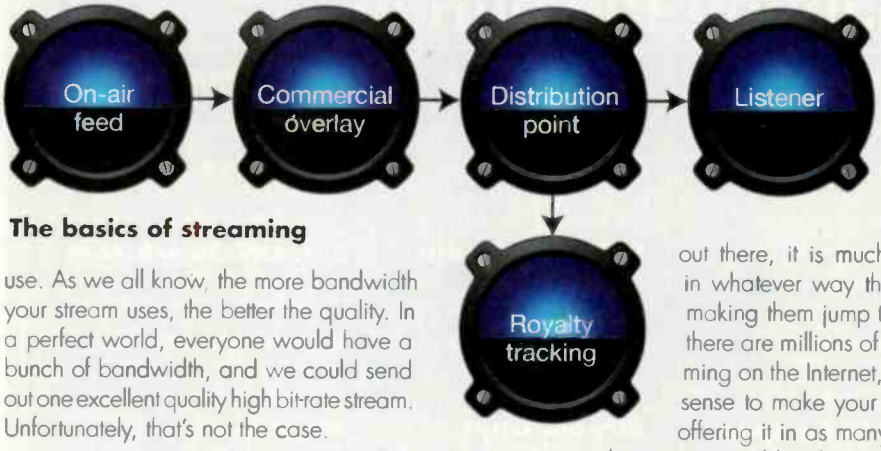
Once you have a few providers in mind, call and ask about their technology. It is important to make sure their encoding software is able to communicate with your digital playback system. The way the overlay systems work is to listen for cues from an automation system's cart metadata stream via serial port or network connection. This metadata includes title, artist and category information. The overlay system filters this data, and when it sees a commercial is playing it shuts off the live feed and drops in the stored content that is scheduled to play.

Not only is the metadata used for overlays, the song title and artist data are used for now-playing information and also to generate the necessary paperwork for royalty payments.

After you've determined the provider's software will work with your digital playback system, you need to look at how you're going to get your audio to the provider's distribution point. Fortunately, you only have one or two streams to deal with, but they're important ones. Your Internet connection is an important investment, because it is the single point of failure in the system. Not only do you need enough bandwidth to feed a decent quality signal

(anywhere from 32kb/s to 128kb/s) but it must be fairly free of other traffic so it's protected from slowdowns caused by congestion. You either need a dedicated connection, such as a business-class DSL or cable circuit, or a high bandwidth connection if it's shared with other users.

Another consideration is the type of encoding you'll use. As we all know, the more bandwidth your stream uses, the better the quality. In a perfect world, everyone would have a bunch of bandwidth, and we could send out one excellent quality high bit-rate stream. Unfortunately, that's not the case.



The basics of streaming

Variety in bit-rates

The latest trend in streaming audio is to encode your audio at various bit-rates and allow the listener to choose either a low or high quality stream. This works well for users with smartphones who may stream your station on both a cellular network and Wi-fi. It does require a little extra bandwidth on the studio side, since you have to encode and send two streams out (low and high quality) but it does result in a better listener experience.

In addition to quality choices, think about how your listeners are going to connect to your stream. For the longest time, stations used streaming audio to draw traffic to their websites by requiring a login or by forcing an embedded player. Think twice before using that tactic. Many stations now realize that with all the choices out there, it is much better to offer the audio in whatever way the listener wants it, without making them jump through hoops. Simply put, there are millions of choices for radio programming on the Internet, so it makes good business sense to make your station an easy choice by offering it in as many formats, and on as many devices as possible. The reality is that the tools already exist to liberate your stream from your site if someone really wants it, so why not stay ahead of the game and give them what they want?

Streaming audio is a very important decision for your station, one that will have a big effect on your operation.

Streaming audio is a very important decision for your station, one that will have a big effect on your operation. It is worthwhile to spend some time researching the companies out there, and more importantly, testing the technology. More and more listeners are seeking their favorite radio stations on the Internet. Are you going to make it easy for them to listen? If you don't, there's a good chance your competition will.

Tarr is director of engineering, Entercom Milwaukee.

Streaming Resources

Abacast
360-834-5229
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Akamai Technologies
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www.akamai.com

Grab Networks
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Backbone Networks
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www.backbone.com

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www.streaming21.com

SurferNetwork.com
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Viewcast.com
800-540-4119
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Collision Course

By Tom Atkins

A joy ride becomes a prolonged project for WILQ.

On Oct. 9, 2008, I received a voice mail from Engineer Brian Hill and General Manager Dan Farr from WILQ in Williamsport, PA. I could tell by the level of shock and frustration in their voices asking me to phone them right away, that this was no ordinary problem.

"Tom, I was woken up at 4:30 this morning from the alarm company telling me there was unauthorized entries in the front door and all the windows at the WILQ transmitter site. When I arrived at the site, there was a log skidder, a vehicle primarily used in the logging industry, parked in the building where the front door used to be". My response was "WHAT THE ... ?! Was anybody hurt?" Fortunately, no one was hurt, and the joy riders were nowhere to be found. The building, on the other hand, was a different story.

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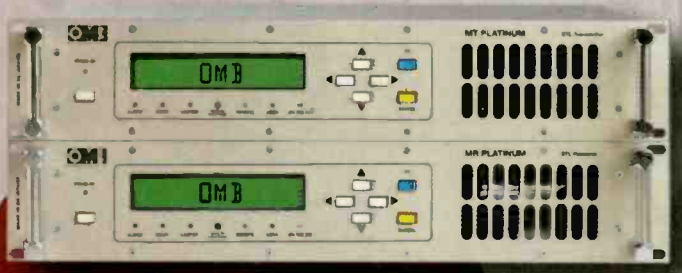
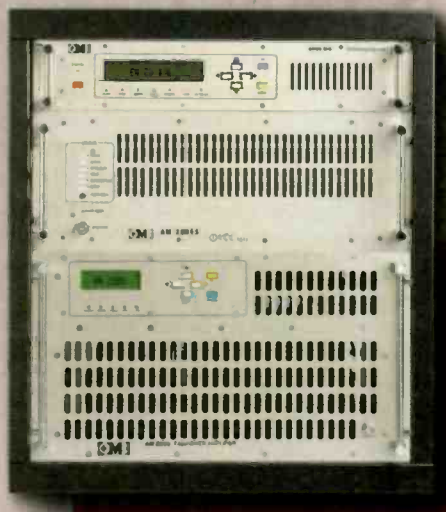


MT/MR PLATINUM

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



EM 2000

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

EM 10000

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

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Collision Course

What can cause this much damage? This log skidder.

In the wee hours of the morning the logging truck was hot-wired and then taken for a ride on top of Bald Eagle Mountain, the location of WILQ's transmitter site. The driver had stopped in front of WILQ's transmitter building, swung the truck around 90 degrees, and proceeded to drive the truck straight through the front of the building using the front door as a target. The truck appeared to have stalled in its final resting place, inside our transmitter building. To everyone's amazement, WILQ remained on the air operating from this newly condemned building.

Because the structure was deemed unsafe, and there really was no way to secure it, the decision was made to have WILQ operate from its auxiliary transmitter site down the road. Power and other utilities would then be turned off at the main site.

First to the backup

The auxiliary site consists of a 1kW solid-state transmitter with a frequency-agile exciter feeding a single-bay antenna all manufactured by Armstrong. This would equate to roughly 10 percent of the station's licensed ERP. However, the height advantage of being on top of a mountain paid off as coverage in the metro of Williamsport was adequate. Or let me put it another way, it sure beat hearing static on WILQ's frequency of 105.1MHz for an unspecified length of time. When operation ceased from the main building, the process of shoring up the damage and somehow securing the building, at least from the elements, was the next concern.

A local general contractor was hired and he installed temporary supports so the building would not come down on its own accord. Small equipment in the building that was not damaged was carried out and stored to be later tested and inspected. The building was wrapped in plastic to keep out the outdoor elements, or at least most of them,

The lonely Harris transmitter with the rolling rack inside the temporary shed.

and the chain link fence was temporarily put back in place as best it could. The real fun would come when we tried to extract the transmitters from the structure.

Temporary facilities

If you're in tune with the survey period of Arbitron ratings you have probably realized that at the time of the destruction the important fall survey was underway, and 10 percent power would create a hardship, not only to the station, but to the loyal listeners of WILQ who live outside the coverage of the auxiliary site. They now could not receive the station. We decided to put all our efforts into erecting a temporary transmitter shelter that could be placed on the property away from the existing building. The tower and antenna were not harmed so it was conceivable we could get back up to full power from the main site. The big problem we had was that the current transmitters were still trapped in the old building and it would be a while before any attempt at removing them could be made. While the search for a temporary building was on, contacts were made to the various transmitter manufacturers to find out who had the shortest lead time on delivery.

We decided that a wooden, garden-variety storage shed was going to be the best solution for a temporary building. The advantage was that it could be delivered and put in place quickly, and with fall heading into winter, heat was not a big concern. It was also economical. In about five days, we had a temporary building on premise, and we hired a local electrician to install 200A single-phase service in the shed. On Oct. 15, we placed an order with Harris for a Z 5CD 5kW solid-state transmitter.

The word *temporary* is defined in the dictionary as *not permanent*. That is the way we envisioned the assembling of the temporary transmitter facility for WILQ: Temporary but reliable. Knowing this, there were some corners cut

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Jack Ruth (owner)

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Ward Holmes, Regional Manager

WHFT, Avon Park, FL
" The tech support is a huge help. Nothing but good things to say, they've always been great & resolved any issues quickly."
Tony Scott, Program Director

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

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Mike Glass, owner

Woodland Hills, CA Internet Radio
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John Tobin

KIKO-FM/KIKO-AM, Claypool, AZ
" I rate (Xtreme) at a 10 for ease of use. It's very simple, with limited engineering experience needed. You open the software & it's all self-explanatory."
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" It's inexpensive & does EVERYTHING! I'm still finding new features!"
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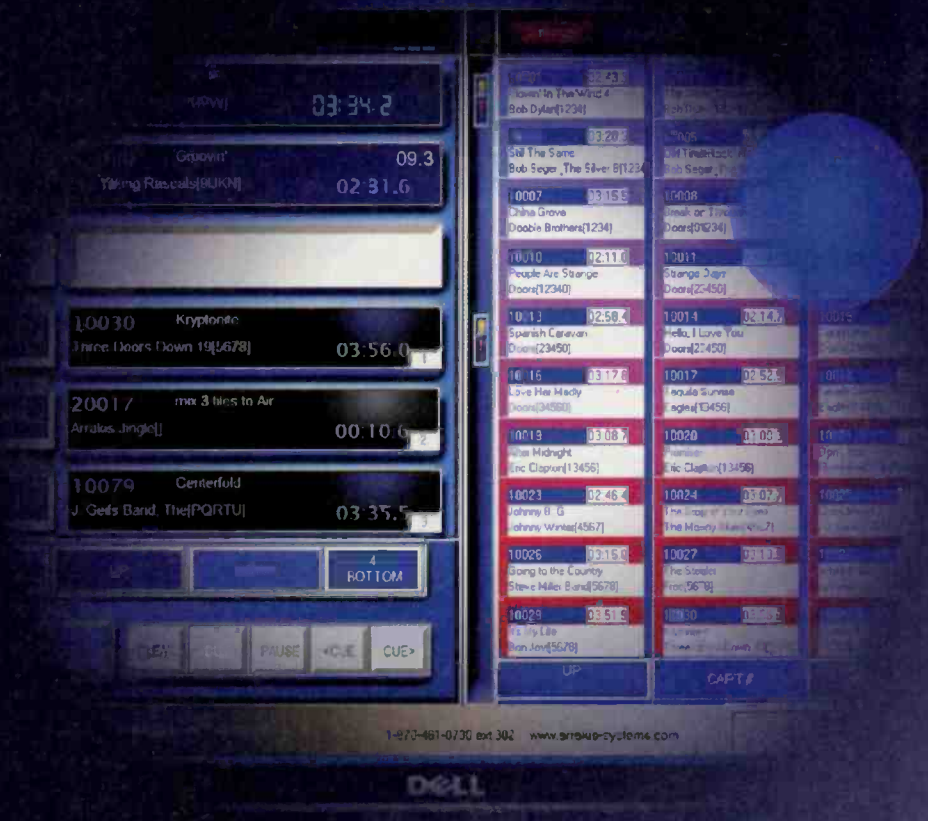

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on purpose. Transmission lines and power for the tower lights were routed through a window in the shed rather than a nice entry bulk head. Grounding was accomplished with wire rather than copper strap. Interconnect wiring was not run as neatly as I would do in a permanent installation. We even used an old Tascam reel-to-reel roll around back to mount the STL receiver and Burk ARC-16 remote control. Safety, on the other hand, was kept as a high priority in addition to making sure the 220V service had a surge suppressor on it. On the morning of Oct. 23, the Harris Z 5CD arrived on a dedicated driver truck and was put in place in the temporary shed. Connections were made to it in the shed and on the afternoon of Oct.

Near completion, the new building sat empty for several weeks before equipment could be moved in.

24, WILQ was back to full power, 17 days after the destruction of the main transmitter building. An EPM was performed to verify that WILQ was operating within its instrument of authorization.

Demolition

Demolition of the existing main building was next on the list. No, we did not forget about the transmitters still inside the old building. After reviewing many possible ways to remove the transmitters, it was determined that the safest for working personnel and the equipment was to box the transmitters and Onan power generator in a protective housing and demolish the building around the equipment. Once the building was down and the debris removed, the transmitters, still in their crates, were removed from the site and transported off the mountain into a storage facility in the valley. While there, they were connected to power and a dummy load and tested in January 2009. To everyone's surprise, both the Harris HT-5 and the Gates 2.5KW worked. We were very skeptical of this given the debris inside the transmitters and the fact that they were subjected to extreme temperature differential for almost a month, not to mention that they sat idle for almost three months.

The new building

With WILQ operating at full power from the temporary shed, and everything except the Onan power generator removed from

the remaining concrete pad, construction of the new building was ready to take place. We discussed, at length, the best way to proceed. There were precast buildings available, which I am a big fan of, however, we ran into a couple of obstacles for a precast. One was the winding road leading up to our mountain site and two, our site sits on land that is owned by the Forestry Department, from whom we lease. The winding road bore tales of other communication companies trying to maneuver a flat bed truck carrying a precast building and dumping its load. Taking a look at the paved road and a couple of the hairpin curves on it, I thought a skilled driver may be able to maneuver it, but we really didn't have the time nor the stomach to risk losing a precast building. Doing this in November in Pennsylvania only added to the fire. Or should I say snow? Besides, if we did actually get a precast building to our site, we would have to renegotiate our lease with the Forestry Department as we would be making a major change. We made the decision to build a cinder block building on the remaining concrete pad exactly the same size as the old one.

The opportunity to build a fresh building has some advantages. Considering the old one was built in the late 1940s, we had the pleasure of constructing something a little more modern. We did not need four small rooms on the footprint of the building, but rather a small room to house the power generator and one large room for the

Equipment List

Armstrong X-Link
BDI CMP-300
Bird 5kW load
Burk ARC-16
Dielectric Model 50000
Harris HT-5, Z-5CD
Inovonics 531
LEA SP-200
Myat 1 5/8 coax, couplings, field flanges, and 90-degree elbows
Onan 15kW genset
Onan/Cummins LT-200
Tunwall TRC-1
Xcel CPS A1/A2

Collision Course

Everything installed and back on the air

equipment and workbench. The plans were drawn to accommodate the new design. Working with a local architect, we also decided to insulate the building and pu' a pitched roof on it with concrete pavers lining the top for ice protection. We also agreed to not install any windows.

A long time ago, a wise old engineer once told me that if you keep the transmitters cool and clean they work forever. Keeping with that tradition, cooling and cleanliness were of top priority. Because the site is on top of a mountain subjected to the Northeastern climate and being only a 5kW TPO, air conditioning was really not needed. The transmitters would vent into the room and a thermostatically controlled 36" exhaust fan would remove any additional heat. The fan would also have gravity-controlled louvers that would close when not running. Clean air intake from the outside was accomplished through a 36" opening on the opposite end of the building. The air intake would have two special requirements. It needed to have a filter box to filter incoming air from any dust, dirt or small insects. It also required a motorized damper that would open when the exhaust fan would turn on. One very important aspect of the motorized louvers is the ability for them to open upon removal of control voltage. The theory behind this is simple: If for some reason the motor or the electric controlling the damper motor fails, the louvers would open and not starve the building for fresh air. Even if a failure happens in the winter months, the heat from the transmitters would be sufficient to keep the building above freezing.

The construction of the new building lasted until the second week of December 2008. When completed, mother nature decided to do what she normally does in winter in the Northeast. There the building sat with

The original transmitter building, the temporary shed and the newly constructed building.

its walls and roof built protecting it from the elements. It did not have electricity or transmitting equipment. It would stay in that condition until February 2009 when we would start populating the building.

Moving in

In building the actual RF facility, we decided to lay out the footprint of the equipment with the future in mind. We did not want to box ourselves in with regards to future tenants or technological advances beckoning at our door. The facility would consist of the Harris Z 5CD, Harris HT-5 and an equipment rack. A wire ladder-rack system was installed above the transmitters and rack making a 90 degree turn toward the back wall of the building where the transmission line bulk head was installed. We were able to populate the RF facility with the Harris HT-5 and equipment rack while still operating from the temporary shed with the Harris Z 5CD. My assistant, Dan Gurzynski, would then proceed to plumb in the HT-5 and dummy load to the Dielectric antenna switch. He would also install the ground system consisting of 2" copper strap.

We purchased a Tunwall TRC-1 controller for the Dielectric antenna switch. It was at this point that Gurzynski would begin the cleaning of the HT-5 and subsequent testing into the Bird dummy load. Utility power was not available in the new building yet, but we did have the original Onan power generator and its new transfer switch installed along with all the rest of the ac power infrastructure. The generator was load tested to assure its reliability and it too came away from the destruction of the old building unscathed. It was this setup that afforded Gurzynski the ability to begin the testing.

By March 2009 the pre-wiring effort to complete as much as we could proved advantageous when it came time to cut over to the new building. In keeping with this theme, we purchased a BDI analog composite DA and a new Armstrong X-Link STL receiver. This would leave only the transmission lines and the Burk ARC-16 remote control to be removed from the temporary shed and put into the new building. A relay panel for the ARC-16 was pre-wired in the new building to ease the move. We would then be operating on the HT-5 while movers transported the Z-5CD transmitter from the temporary shed to the new building at the end of May 2009. Considering that the spring 2009 rating survey would be well underway before we cut over, we wanted to reduce the amount of time we had to be on the auxiliary site down the road operating at 10 percent power.

In the second week of June 2009, the Harris Z 5CD was finished being wired into the facility, tested and subsequently put on the air. Countless hours were poured into the reconstruction of the WILQ transmitting installation. Our plan was to rebuild it to be professional and reliable. It is now finished and thankfully this chapter in the history of Backyard Broadcasting's WILQ is now closed.

Atkins is VP, director of engineering of Backyard Broadcasting, Buffalo, NY.

More photos online at www.RadioMagOnline.com

Tips, tricks, hints and more

By Chriss Scherer, editor

Feel the power

We're a power-hungry industry. Electrical power, that is. As our technological diversity increases, our demand for power and reliance on power supplies follows. The consequence is the need for more power outlets for equipment installations. In addition, to benefit manufacturing processes, more power supplies are being brought outside the device. The mix of wall warts, line lumps and power chords can present some challenges when installing all the equipment in a rack.

Multiple wall warts can get in the way of each other and cover outlets. Several manufacturers offer short extension cords to remove the wart from the outlet strip, effectively making the wart a line lump. This may help recover wasted outlets, but presents a new problem: what to do with a line lump?

I have seen line lumps attached to the side of the rack using nylon ties. This gets them out of the way, but makes it difficult to extract them if the equipment needs to be serviced. An alternative is to use a Velcro strap to secure it in place. This makes removal and reinstallation simpler. Similar straps can be used to mount utility boxes in racks and furniture.

Sometimes a manufacturer includes an inexpensive or underpowered lump or wart with a piece of equipment. When these supplies need to be replaced, it's a good idea to use a better-quality device when possible. Also check to see how hot the old supply is. A supply with higher current capacity will run cooler and likely last longer.

Photo by Kirk Chestnut, CPBE

A velcro support is a handy way to mount power supplies and utility boxes.

In some cases, I have seen stations install a master dc power supply to feed several devices. While this addresses the installation issue, it can create a new problem: a single point of failure for several devices.

What are your solutions for wall warts and line lumps? Share them with us and we'll include them in an upcoming Tech Tips.

Shop around and cut costs

When a device's internal power supply fails, it's not uncommon to contact the manufacturer for a replacement. Obtaining an exact and direct replacement ensures that the replacement supply will work properly with the device. In many cases, it may be possible to find an equivalent replacement supply through other sources.

Ben Weiss, a contract engineer in Kansas City, tells me that he recently had to replace a power supply for a codec. When he called the manufacturer, the replacement power supply cost was quoted at a price that was more than Weiss wanted to pay. He looked online and in a few clicks found an alternative.

He found the same supply through a computer parts retailer that cost 1/3 the price. The only difference is that the computer retailer's unit had a different dc connector. By shopping around a little, Weiss found a near exact replacement. For a few minutes of his time to replace a connector, he came out ahead.

The original supply (left) and the purchased replacement supply (right) with the four-pin XLR power connector installed on the new supply

This is not a slap at the codec manufacturer. That manufacturer is a low-volume reseller of the replacement supply compared to the computer parts retailer. The codec manufacturer also has to charge to provide the proper connector, and add some cost for his handling. In this case, a little time from the engineer saved that station some money. The engineer's time has value, too, but even with that added the station saved half the cost for the replacement.

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

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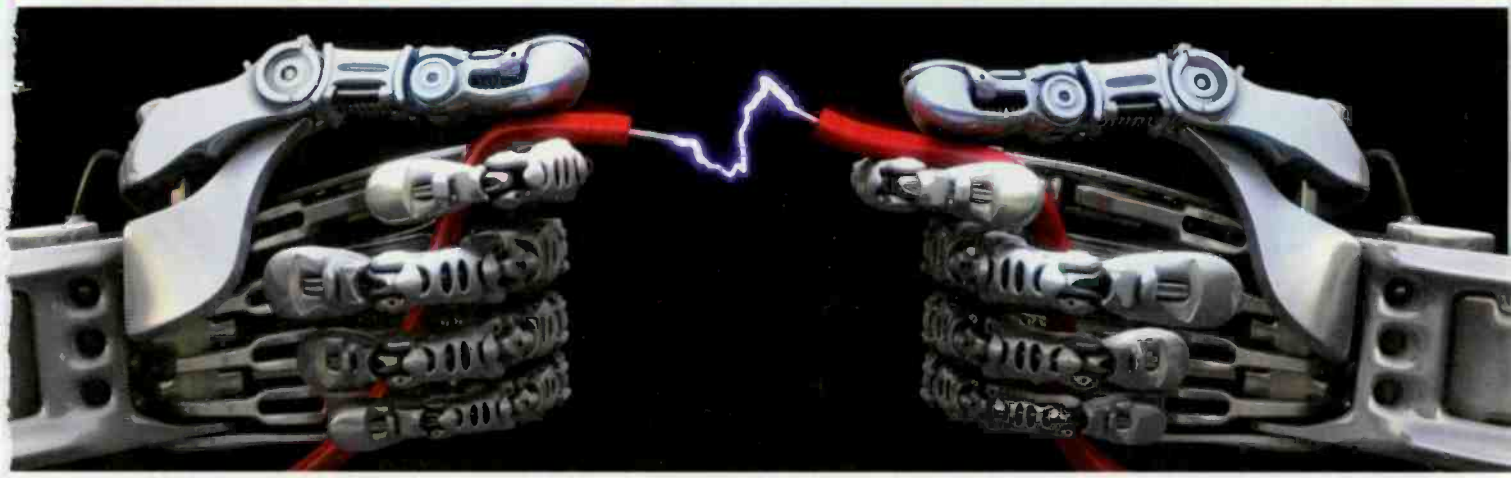

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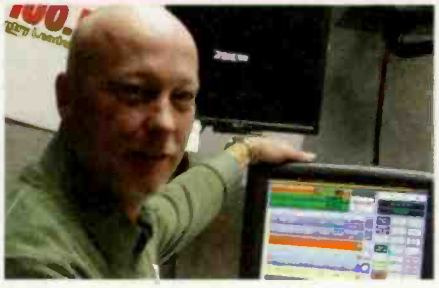
~ Jim Franklin, Program Director
WVBO, Appleton/Oshkosh - Wisconsin



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

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~ Leslie Whittle, Program Director
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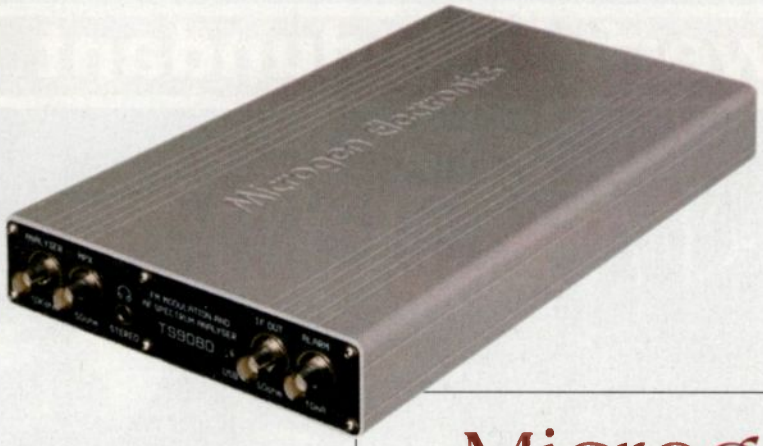


Microgen TS9080

By Tim Diehl, CBRE

Last summer I was in Phoenix, AZ, commissioning an HD Radio installation when I received a call to assist another engineer repairing a transmitter. During the repair he showed me an early version of the Microgen FM analyzer. I was impressed and decided to research the product when I returned to Tulsa, OK. The result of my research: I added the TS9080 to my collection of test equipment.

Unlike most contract engineers, I carry a large assortment of RF test equipment, i.e. E4402B spectrum analyzer, IFR COM 120C service monitor and more. The 4402 will accurately measure absolute peak deviation and all the harmonics, the COM 120 will monitor deviation, transmitter frequency and more. But I was still unable to see key information to fine-tune FM transmitters. The Microgen TS9080 allows an engineer to peer deep inside the integrated parts of the FM Stereo carrier.

Put to use

The TS9080 continuously decodes RBDS with more information that you knew was there, a division histogram, and displays modulation power over a time period. It has an audio baseband spectrum analyzer from 0-100kHz, a peak deviation monitor, stereo monitor with an oscilloscope view of left and right channels and a XY scatter display showing stereo quality similar to a vector scope.

The TS9080 displays a multipath XY plot for signal integrity. It displays pilot in percentage or kilohertz, RBDS in percentage or kilohertz, and signal strength in multiple settings. Personally I would prefer decibels. The unit also has a balanced left and right audio output, which is perfect for the Tektronix Vector scope, and a stereo headphone output. It will also provide computer stereo output via the USB control cable. All of these readings can be taken through the receiver.

It has a total of four inputs: an FM receiver, multiplex input, analyzer input (ability to look at composite signal before applying it to an exciter) and 10.7MHz input. The Microgen software works great with my laptop and desktop computer. The unit can be used to monitor multiple sites and provide an external alarm if there is a failure. Scans of the market will display call letters or slogans if they are sending RBDS. These 'scans' can also be saved as setups for future measurements.

The software side

Each section of the computer display has a copy button. This takes the image of that section and places it on the Windows clipboard. From here it can be pasted into a document to provide a permanent record or report for a client. Since screen resolutions of computers vary, with lower resolutions some of the detail screens are not displayed. These are available through on screen buttons and will pop up over the main screen. So while your particular computer may not display everything at once, it is all there.

The software also lets you save short recordings on your computer. When played back, they display the data as if live.

In my shop, I have run the TS9080 through multiple tests and found it to be more than acceptable. Testing the unit with the E4402B and COM 120C I have found the unit to be very accurate.

While it works well right out of the box, I have learned its deviation should be field calibrated to be extremely accurate. This is a simple procedure. The calibration resides in the computer not the unit itself. It must be calibrated for each PC. I use

Performance at a glance

- Digital phase FM demodulator
- User programmable input gain control
- BNC IF 10.7MHz input and output
- USB powered
- Aluminum enclosure
- Ilog remote control software

the second Bessel null of 13,587kHz method to complete my calibration.

Once calibrated it is ready to use; keep in mind that the most accurate readings are taken from the transmitter sample port. Don't forget to check the sample port's power output or this could be a short trip. Always start with 40 to 60dB of attenuation between the port and the Mircogen unit; it works best at about -20dB. When using an antenna, extremely low multipath of less than 1 percent gives the best readings (the lower the better).

The unit can also be used from the studio to monitor your station as well as others in the market. While most FM antennas work and provide adequate results, I would recommend using a high-gain in-band beam antenna to reduce multipath. If you are going to monitor other stations, you would also need a rotor to turn the antenna toward the transmitter sites. Multipath can and is most often the cause of inaccurate remote readings and the Microgen will provide that information.

In the FM world it is important for a multitude of reasons to accurately set the pilot, RBDS and audio levels. Station product quality is a must in today's markets.

The TS9080 is manufactured in England by Microgen Electronics. The unit is powered by the USB port on the computer. It measures 5.8"×1.4"×11.6" and weighs only 2.43 pounds. It is small and light enough to carry in a laptop bag. The software is supplied on CD-ROM with free updates from the Microgen website.

I give the Microgen TS9080 100 percent thumbs up. It is an outstanding test tool and a must for serious engineers.

Microgen Electronics

P +44 20 8647 8238

W www.microgenelectronics.com

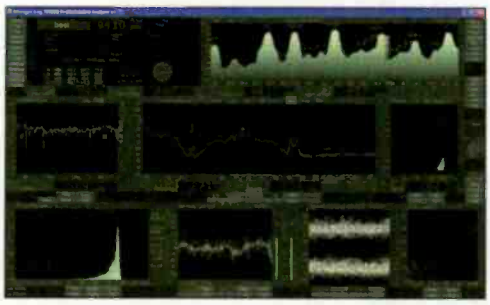
E info@microgenelectronics.com

Sierra Multimedia

P 479-876-7250

W www.sierramultimedia.com

E ray@sierramultimedia.com



The analyzer's data is clearly displayed with the included Ilog software.

Diehl is the president/owner of RF Solutions, LLC, Tulsa, OK. Microgen products are distributed in the US by Sierra Multimedia.

Note: Since the release of the TS9080, Microgen has added features and also offers the TS9085.

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.

by Erin Shipps, associate editor

Professional powered mixers
Mackie

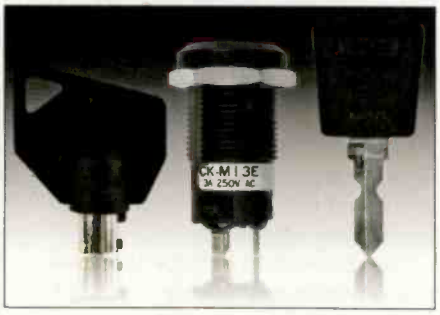
PPM Series: Each model in the PPM Series features custom-designed Mackie Class-D Fast Recovery Amplifiers, which are cooler running and more efficient than their predecessors. Mixing tools include premium Mackie preamps, two built-in DI boxes, three-band active EQ, and in-line compressors. The new onboard 32-bit RMFX+ effects processor boasts a useable set of Mackie reverbs, choruses and multi-tap delays. The PPM608 eight-channel, 1000W powered mixer includes eight premium Mackie mic preamps, 48V phantom power and six TRS inserts. The PPM1008 eight-channel powered mixer provides 1600W of power, eight premium Mackie mix preamps, 48V phantom power and six TRS inserts. The PPM1012 12-channel powered desktop mixer features eight mic/line mono inputs and two stereo line inputs – all the features of a Mackie mic/line mixer, with the added benefit of powerful built-in amplifiers.

800-898-3211; www.mackie.com
productinfo@mackie.com

Keylock switches
NKK Switches

CKM Series: The CKM Series on-off-on switch models with tubular keys feature a push-and-lock mechanism that indicates when the switch position has been changed. They also feature a vertically rotating switching mechanism and self-cleaning sliding contacts to ensure a long operating life, smooth operation and guaranteed circuit contact. Incorporating an antistatic insulating material, the Series is able to withstand 15kV of electrostatic discharge. Their strength rating is 1,500V between contacts and case for a one minute minimum. In addition, the terminals are epoxy sealed to prevent the entry of flux and other contaminants. A 16mm double flatted bushing ensures the CKM Series fits securely in panel mounts. These switches are available in single-pole configuration and two-position and three-position models. The two-position models feature a 90 degree angle of throw and the three-position models a 45 degree angle of throw. Keys are supplied with randomly assigned key numbers and one key is provided with each switch.

480-991-0942; www.nkkswitches.com
sales@nkkswitches.com

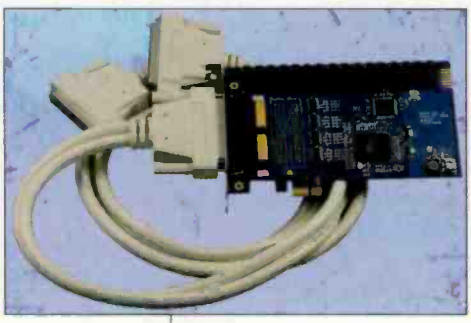


In-rack monitor
AEQ

AM-04: The AM-04 works anywhere numerous audio signals must be monitored, even those that are part of a video broadcast. It accepts four analog audio signals, has two pairs of AES digital audio outputs with an additional analog audio signal, and an SDI video embedded audio signal. The AM-04's control system with single rotary controls and switches has no menus to navigate. It works in three ways: individual left and right high frequency, with common low frequencies, has a headphone output, and sports two pairs of tri-color peak VU meters, each with 26 LEDs, and a phase control between each pair of VU meter bars.

800-728-0536; www.aeqbroadcast.com; sales@aeqbroadcast.com

PCI Express digital I/O interface adapter
Sealevel



DIO-32.PCIe: The DIO-32.PCIe is a PCI Express digital I/O interface adapter. It provides 16 optically isolated inputs and 16 reed relay outputs, which can be utilized for PC-based control and automation of equipment including sensors, switches, A/V studio automation, security control systems, and industrial automation systems. Sealevel PCI Express serial boards are designed for computers with X1 PCI Express slots. Software for standard PCI boards will also work with PCI Express boards, simplifying your transition to this next-generation PCI bus.

864-843-4343; www.sealevel.com; sales@sealevel.com

The Dial and Beyond

Profit from what's now — and what's next.

Today, the world of radio faces challenges unique in complexity, intense in difficulty and great in number. Competition for ad dollars and a weakened economy call for unprecedented new technology, upgraded innovation and dynamic new business strategies to drive the industry forward. **Today the question remains... What can be done with the technology of tomorrow?**

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Add to the conversation on Twitter at #radiorevolution!

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www.nabradioshow.com

Hermaphroditic connectors
Gepco International

Amphenol TAC-4, TAC-12: Gepco has added Amphenol TAC-4 four-channel and TAC-12 twelve-channel hermaphroditic connectors. The connectors are industry standard, multi-channel formats designed to withstand use and abuse in harsh environments. As with all of the company's fiber assemblies, Amphenol assemblies are factory terminated by Gepco and feature precision, machine-polished contacts that offer UPC quality to achieve -55dB return loss specifications. This process helps to attain excellent optical clarity and alignment, reducing back reflection and minimizing insertion loss. For further transmission assurance, all assemblies are 100 percent tested and verified for consistent performance and feature premium quality connectors and components.

800-966-0069; www.gepco.com
gepco@gepco.com

Programmable voice processor
Airtools

Voice Processor 2x: This microphone processor offers a comprehensive set of voice enhancement tools. The 2x's Windows software application enables total control of all essential parameters. Once a desired sound is dialed in, all settings are saved as named presets for later recall from the front panel or remotely. Any mic can be optimized for a diverse air staff. The device has two inputs selectable as line or mic level with phantom power and four outputs. All signal processing is controllable via software. Audio inputs and outputs are accessed via rear panel XLR connectors.

425-778-7728; airtoolsaudio.com
sales@symetrixaudio.com

AM transmitter
Nautel

NX25: The NX25 offers digital pre-correction, 2.7MHz direct digital modulation and 88 percent efficiency. All NX Series transmitters are unique in their ability to add an optional HD Radio Exgine embedded signal generator card directly within the transmitter. Nautel's module-level design of the NX Series provides redundancy and enables users to interchange NX25 parts if needed with an other NX series transmitter. Nautel's Advanced User Interface is included on the NX25. This 17" color LCD screen with configurable displays includes real-time impedance measurement, instrument grade spectrum and audio analyzers, IBOC modulation analyzer, module-level monitoring and control/logging of all functions. The AUI can be controlled by touch screen or via a mouse and keyboard; users also have 100 percent remote access to the NX25 via a Web browser.

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

Modulation monitor
Day Sequerra

M2HDSP: The M2H-DSP, Day Sequerra's newest modulation monitor for HD Radio employs the company's recently developed digital signal processing (DSP) architecture, first introduced in its M4DDM. The M2HDSP runs Day Sequerra's new proprietary Time Lock algorithm to automatically maintain perfect alignment of the HD Radio main program signal (MPS) analog and HD-1 digital audio. Using its selective off-air tuner, the M2HDSP measures the MPS analog and HD-1 digital audio diversity and generates a continuous stream of correction vectors to keep the analog and digital audio perfectly time and level aligned. These correction vectors are then sent via Ethernet to an HD Radio embedded exporter or compatible audio processor to provide the necessary adjustments to the analog audio delay.

856-719-9900; www.daysequerra.com
info@daysequerra.com

Recording microphone
Yellowtec

IXM: IXM overcomes the imbalance of microphone and recorder performance. The microphone heads are optimized for high speech intelligibility and low handling noise sensitivity thanks to Beyerdynamic. The heads are exchangeable to suit different recording environments. Omnidirectional, cardioid and supercardioid pick up patterns will be available. Capsules are automatically detected for automatic gain and DSP adaption. The IXM utilizes an intelligent leveling algorithm that takes advantage of the higher ADC to file resolution by four bits. Files are stored on an exchangeable SD memory card as WAV, BWF, MP2 or MP3.

+49 2173-967 30; www.yellowtec.com
info@yellowtec.com

Radio automation interface
Harris

VM Quadra: The VM Quadra radio automation software interface increases functionality, reduces complexity and creates new workflow options to and from automation servers, digital audio workstations and satellite systems. Each VM Quadra interfaces with up to four automation computers and connects via CAT-5 to Vistamax audio management system frames. The complete solution provides greater flexibility in audio source and destination connectivity, and minimizes the complexity of the distributed computer network and the number of audio channels required for each automation computer.

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

UPGRADES and UPDATES

Audiofile Engineering has released version 1.1 of Fire, its field recording app for the Iphone and Ipod Touch. The app update adds varispeed playback, multiple VU meter styles and adjustable input gain. www.audiofile-engineering.com)...
Middle Atlantic Products is now offering its signature Signal Safe cords on all power products at no extra charge. The cable technology is designed to reduce radiated ac magnetic fields in AV systems that induce noise in signal wiring. (www.middleatlantic.com) ■

Rackmount voltage regulator

Furman Sound

P-1800 AR: The P-1800 AR rackmount voltage regulator/power conditioner is a successor to Furman's popular AR-15 II. The P-1800 AR provides stable voltage protection and line noise filtration for any A/V installation where reliable, comprehensive protection is needed. It provides consistent 120V output (±5 volts) from input voltages ranging from 97Vac to 137Vac. Unlike commercial voltage regulators, the P-1800 AR's new true RMS voltage regulation technology, features an ultra-low-noise, microprocessor-controlled eight-tap toroidal autoformer. The P-1800 AR offers Furman's advanced Linear Filtering Technology, SMP surge/spike protection, and EVS (Extreme Voltage Shutdown) technologies for professional-level protection from spikes, surges and dangerous prolonged voltage conditions. The 15-A unit features eight fully regulated, protected and filtered rear-panel outlets and a front-panel convenience outlet.

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

Pro sound system packages

Anchor Audio Communications/Portaco

Explorer: The next generation Explorer Pro is for sound projection in indoor or outdoor settings and playing music. The unit delivers 110dB of intelligible speech from one sound system designed for users with no technical knowledge. The new Explorer Pro is versatile with true ac/dc, a 110/220 power supply and improved battery life.

800-262-4671; www.anchoraudio.com

Live podcasting/broadcasting

Small Plate Radio

Internet Radio/Audio Studio: Clients can leverage Small Plate Radio in two ways. The first is Live Podcasting, which lets brands, businesses and lifestyle interests broadcast live 30 to 60 minute shows from anywhere, engineered from the Small Plate Radio studios in Portland, OR. Shows are pre-promoted and broadcast live with the ability for end-users/listeners to interact with the show via instant message, e-mail and phone. Shows are hosted by Small Plate Radio then podcast and promoted after the live broadcast. All shows are created as private-label and clients own 100 percent of the content. The second part of Small Plate Radio is Live On-Site Broadcasting. Xhang Creative has set up successful stations that broadcast live at conferences and events around the country. It has grown to include pop-up radio stations for the Radio Advertising Bureau, the Association of National Advertisers and the American Association of Advertising Agencies.

503-734-8709; www.smallplateradio.com; hithere@smallplateradio.com

EAS watch Endec Serial Monitor
Cascade Technology Corporation

ESM-1: The ESM-1, Endec serial output monitor, is a freestanding unit designed to monitor an Endec for received EAS alerts. The ESM-1 provides reports for required weekly and monthly tests, saving time by eliminating the need for station test surveys and county check-ins. When the unit detects Endec activity, it converts the alert message into a digital packet and sends the information to the server through an Ethernet connection via Internet. Unlike the RSM and OSM models, this unit does not monitor on-air broadcasts and therefore does not report whether the station is on or off the air. Connectivity is regularly confirmed by communications with the server. Should there be a connection disruption, the unit stores alert information and updates the server as soon as the connection is restored. The ESM-1 reports all alerts sent to the station's Endec allowing the EAS Watch server to detect and track spurious EAS alerts.

360-988-0459; www.easwatch.com
info@easwatch.com

Announcer's turret
Dixon Systems

AT-22: The Dixon Systems AT-22 is an announcer's turret that will work with almost any broadcast console. The turret controls two microphones (on/off) and includes two stereo headphone amplifiers with individual gain controls. A talkback receive function is built in. Its compact size makes it perfect in the booth or studio. All switching and indications are simple ground starts. The switches use surface mount LEDs and light pipes. Audio inputs are left and right, plus talkback. Talkback audio is fed to left when activated. There are no mic preamps in the turret.

416-261-3773; www.dixonsystems.com
helpdesk@dixonsystems.com

Pro lightweight rack case
Ace Products/Kaces

KPRC-2, KPRC-4: KPRC-2 and KPRC-4 lightweight rack cases feature rigid plastic panels designed to absorb shock and protect equipment; a water-resistant luggage-grade nylon exterior; and 20mm padded laptop pocket that opens to the interior of the rack case so cables can be pre-wired for quick setup and easy transport. Rigid flaps open in the front and back. A front flap has additional 20mm foam padding to protect knobs and front panels. Rack rails are recessed 1" to allow additional room between front flap and equipment. Comfortable bolted soft rubber handles are on top and bottom for multiple transport options.

707-765-1500; www.kaces.com; info@kaces.com

Chassis connector protecter
Neutrik

Dummy Plug: Neutrik is helping keep the dust out of unused chassis connector inputs through its newest product accessory, Dummy Plug. Because dust can build up, especially with larger audio consoles with several inputs that are not all necessarily being used at the same time, Dummy Plugs are designed to protect unmated Neutrik 2- and 4-pole speakon chassis and powercon chassis connectors. Dummy Plugs are rubber covers that fully protect the connector in the unmated condition. They can also provide convenience and security in the studio or out on the road, as unused inputs can be covered, avoiding any confusion or miswiring during setup.

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

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THE RADIO TECHNOLOGY LEADER

www.RadioMagOnline.com • radio@penton.com

Editor – Chriss Scherer, CPBE CBNT, *chriss.scherer@penton.com*
Technical Editor, RF – John Battison, P.E., *batcom@ohio.net*
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
Harry C. Martin, *Legal*
Kevin McNamara, CNE, *Computers and Networks*
Mark Krieger, CBT, *BOC and Contract Engineering*
Russ Berger, *Broadcast Acoustics*
Donald L. Markley, P.E., *Transmission Facilities*

Contributors
Doug Irwin, CPBE AMD; Chris Wygal, CBRE; John Landry, CSRE

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 Mgt. – Melissa Langstaff, *melissa.langstaff@penton.com*
Production Coordinator – Steven Kapp, *steven.kapp@penton.com*
Client Services Coordinator – Jesse West, *jesse.west@penton.com*
Classified Ad Coordinator – Sarah Maxey, *sarah.maxey@penton.com*
Audience Marketing Director – Barbara Kummer, *barbara.kummer@penton.com*
Audience Marketing Manager – Marie Evans, *marie.evans@penton.com*

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Editorial Reprints
Penton Reprints
Phone: 877-763-2303
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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:
Microgen Field Report, page 32

Tim Diehl, CBRE
Owner/President
RF Solutions
Tulsa, OK

Diehl started RF Solutions approximately six years ago with 28 years of field engineering experience in radio, computer and heavy industry. He is a member of the Society of Broadcast Engineers and a member of the Oklahoma Association of Broadcasters.

Radio
THE RADIO TECHNOLOGY LEADER

Written by radio professionals
Written for radio professionals

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ADVERTISER INDEX

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

Do you remember?

We stumbled upon Steve Johnson's beautiful collection of radios and couldn't resist passing it along. Stay tuned to a future issue for a snapshot of his tube testers. All information courtesy Steve's website at: www.stevenjohnson.com.

1. This Philco 49-1401 Radio/Phonograph was produced in 1949 and plays 10" and 12" 78RPM records. It contains Philco's M-7 automatic record player. Just slide your favorite record in the front. It starts automatically.

2. These Pee Wee Pocket Radios are early (1940s?) portable crystal radios. One lead clips to any good ground and the other clips to any metal or wire that will act as an antenna. No batteries are required. This radio has no earphones. You hold it up to your ear to listen to an AM station.

3. A Freed-Eisemann NR-7, a two-stage Neutrodyne Receiver, sold by Clark Music in Syracuse in the 1920s.

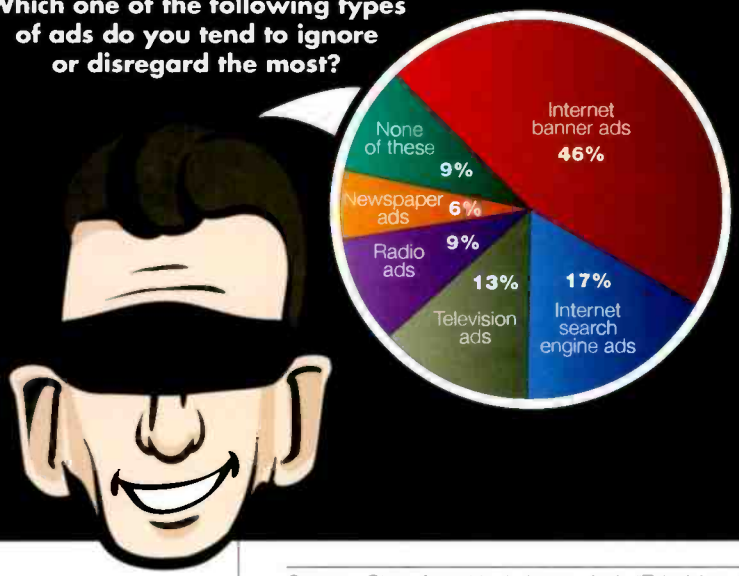
4. A Crosley 50 AM Tube Radio (1924) was Steve's first antique radio. "A friend of my father gave it to me when I was around 16," he wrote. "Using a Crosley 'Book Condenser' for tuning, it has one tube and runs on batteries. It was most often used with headphones. To the left of it you can see the base of a Radiola (RCA) speaker (1924)."

Sample and Hold

Ads people ignore

With businesses shifting to a more Web-focused approach, it is interesting to note how advertising is being affected. According to a Harris Interactive survey, 46 percent of adults are ignoring Internet banner ads. However, 91 percent of radio listeners are listening to radio ads. That's a big deal. Businesses in general are going to have to re-think how to approach Web advertising if they want to keep selling the space. My thoughts? Good luck.

Which one of the following types of ads do you tend to ignore or disregard the most?



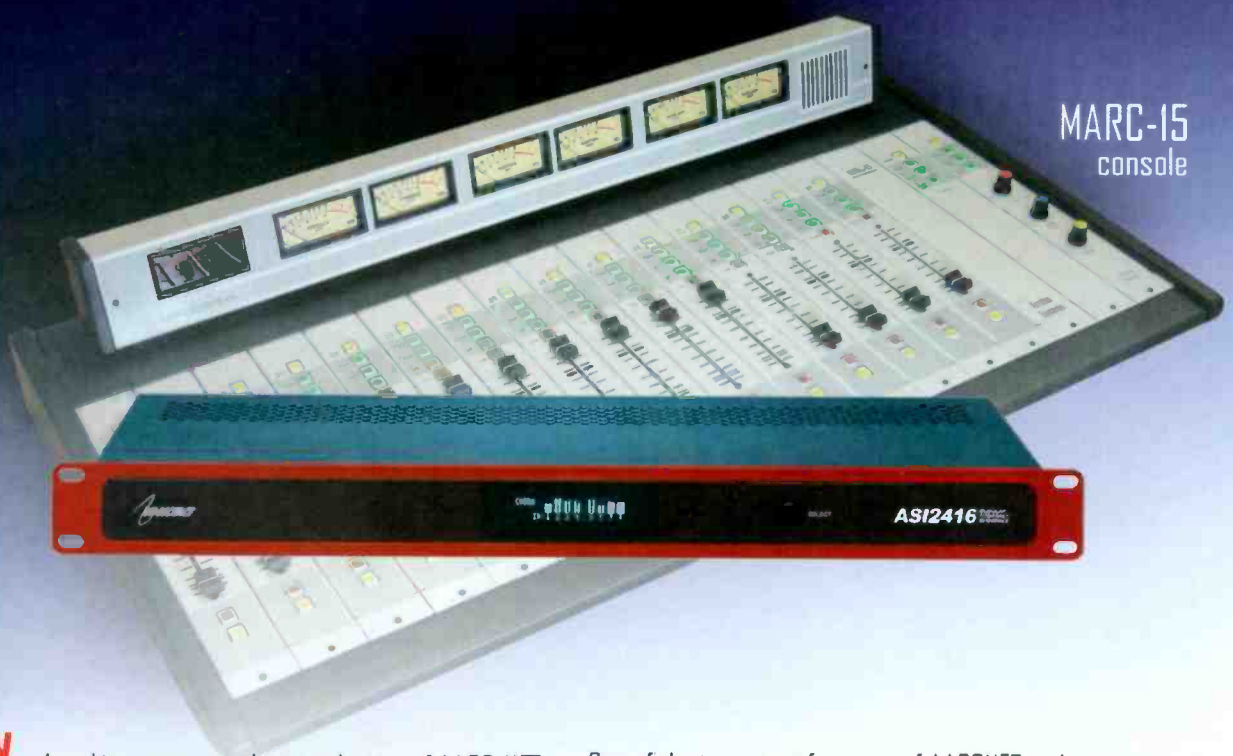
Source: Chart from Harris Interactive's "Television Ads Considered Most Helpful to Americans" report

NEW

audio networking from ARRAKIS

ARRAKIS AARC-NET

AUDIO NETWORKING MADE SIMPLE



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

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

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

www.arrakis-systems.com 970.461.0730

IF YOU THINK THE DASHBOARD IS COOL, JUST WAIT 'TIL YOU HEAR WHAT'S UNDER THE HOOD...

VORSIS AM-10HD

VOTED HOTROD RADIO MAGAZINE'S AM PROCESSING RIDE OF THE DECADE

It's drive time! Introducing the 2010 Vorsis AM-10HD.

Sleek, powerful, and sporting a kicking sound that will have your listeners glued to their radios, the Vorsis AM-10HD is the first modern processor designed for the AM band.

Let's face it – your audience has changed. Their idea of good audio is what they hear on their iPods, MP3 player and, of course, FM. Problem is, AM still sounds the same. But it doesn't have to.

That boxy, distorted sound coming from your competitors is simply the sound of old-school radio and old-world processing. It just doesn't cut it anymore if you want to be first to the finish line.

Vorsis took a fresh look at processing AM and the result is an out-of-the-box experience. Voices that sound like voices. Music that sounds natural – yes, even on AM! Processing that produces a higher average modulation while staying uncannily clean. And unlike FM, higher AM average modulation directly increases your coverage area.

The AM-10HD is ready to go, full of great sounding presets carefully tailored for different formats and processing goals. Installation and setup takes only minutes.

But that's only the beginning. The AM-10HD has the equivalent of a Formula ONE engine, so regardless of your format, it can be tuned to deliver your signature sound – the one your listeners recognize without even having to look at the dial – each and every second you are on the air.

It's a new model year, and the AM-10HD is just the ride you've been waiting for. Hop in and meet the new boss – it's revving up to drive your station to a win.

WHEATSTONE VORSIS

Radio has evolved. Your sound should too.™

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