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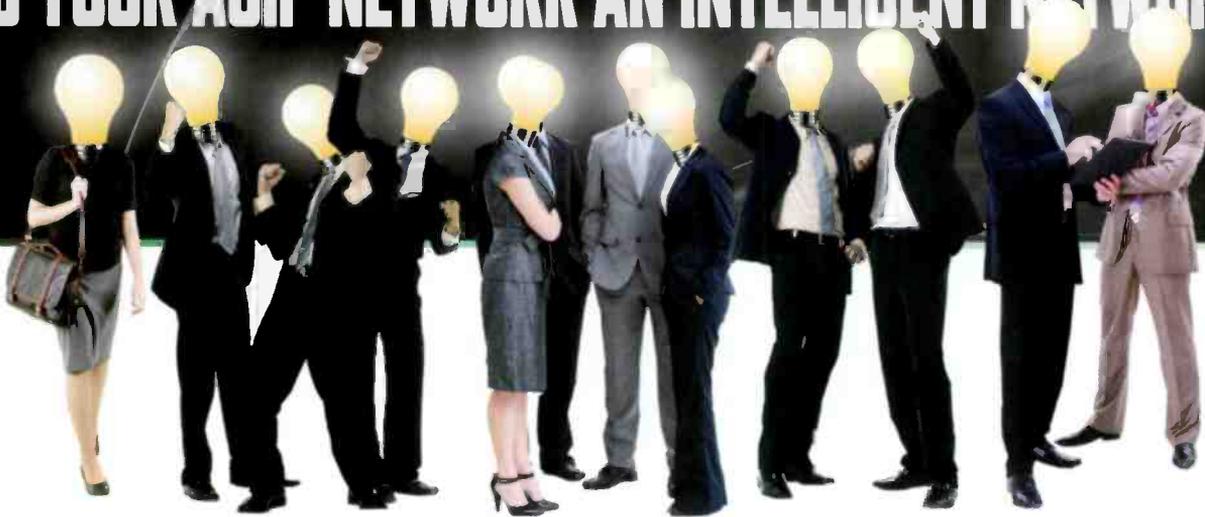


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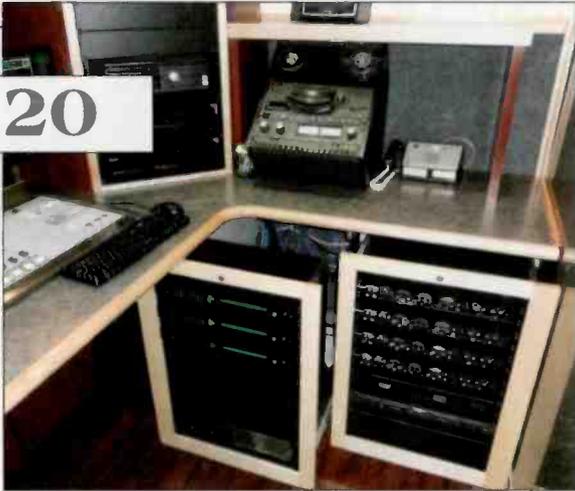


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### ON THE COVER

After 31 years KMXL-FM and KDMO-AM, in Carthage, MO, embark on an infrastructure overhaul, pulling off big ideas in a small town.



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# Currents Online

Selected headlines from the past month.

## NAB Accepting Nominations for 2011 Engineering Achievement Awards

The award winners will be recognized at the Technology Luncheon at NAB 2011 on April 13 in Las Vegas.

## AEQ Moves to Greener Pastures ➔

AEQ's new headquarters has triple the capacity of its previous facility and was built using the latest eco-oriented technologies.



## Ibiquity Releases HD Radio SFN Booster Test Report

The tests were conducted to examine digital performance and digital compatibility with the analog host signal and were funded by the NAB Fastroad initiative.

## Apple Rejecting Radio Apps for iPhone

We received a letter to the editor from Jim Barcus saying that Apple is rejecting single radio station apps. Details are still developing.

## RAB: Radio Revenues Continue to Rise Through 2010

The RAB says radio has continued its upward trajectory in Q3, maintaining its year-long 6 percent growth rate.

## New HD Radio Concept Provides Customizable Listening Experience

The Persona Radio is a proof-of-concept advanced receiver design that would allow users to create a customizable listening experience and opportunities for behavioral-targeted advertising.

## FCC Extends EAS Compliance Deadline to Sept. 30, 2011

The FCC extended the deadline from 180 days to 360 days, making the new deadline Sept. 30, 2011.

## Find the mic and win!

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

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## Site Features

### EAS/CAP FAQ

Updated constantly, find the latest answers to questions about the 360-day deadline.

### Newsletters Keep You Informed

The weekly Radio Currents, the twice-monthly Digital Radio Update and twice-monthly New Products Extra put the latest in radio technology in your e-mail inbox. Subscribe today.

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## Some CAP breathing room

**W**hen FEMA formally adopted CAP at the end of September, there was no collective sigh of relief from broadcasters. This was not only because FCC Rules required broadcasters to be CAP compliant 180 days after FEMA made its decision, but also despite months of lead time, there are many issues that were yet to be addressed for stations to fully implement CAP-capable equipment.

Once the FEMA decision was announced, several groups, including the Society of Broadcast Engineers, the NAB, the FCC's own Communications, Security, Reliability and Interoperability Council (CSRIC) and others began investigating the details. At minimum, a station only needs to be able to receive CAP messages and relay messages from the governor. From my conversations

with the various EAS equipment manufacturers, the available or soon-to-be available equipment can do that. But broadcasters are still understandably unsure. No one wants to buy a piece of capital equipment that won't be compliant tomorrow.

A filing by the SBE, NAB, MSTV and nearly all the state broadcast associations stressed equipment compliance certification. The groups supported a 180-day extension (totaling 360 days) of the looming CAP-compliance deadline. CSRIC also endorsed the time extension.

CSRIC made several suggestions to ensure the revisions to Part 11 EAS rules and the overall CAP implementation are a success. Among other points,

## Remote Up in the Air? Get it ON the Air with ACCESS!

"We were invited to ride along in a hot air balloon to help promote the Grove City Balloons and Tunes Festival near Columbus," says Matt Bruning of WTVN in Columbus, OH. "When I asked about doing a live shot from 2,000 feet up, our engineering department went straight to the shelf with our Comrex ACCESS on it. The unit did a great job...as we expected. Thanks so much for making a GREAT product like the Comrex Access - so easy even a news person can use it!"

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CSRIC recommends clarification of the state governor must-carry implementation, station monitoring of multiple IP-based CAP alert sources, and ensuring state and local governments update their EAS plans to accommodate CAP (this was also part of the SBE/NAB/MSTV joint filing).

The good news for broadcasters is that the 180-day deadline has been extended to 360 days, making the deadline Sept. 30, 2011. The FCC cited multiple factors in industry filings in approving the extension, including the need for certification of the new equipment and the costs associated with purchasing the CAP-compliant equipments by EAS participants.

But just because the deadline has been extended, broadcasters should not be passive and simply wait until August 2011 to think about EAS and CAP again. While EAS/CAP equipment certification is beyond the control of broadcasters, I know the EAS manufacturers are working to complete this process with the FCC. But broadcasters can be involved in the efforts to update local and state EAS plans now. I hear plenty of complaints about the current EAS being broken. Here's a chance to fix it.

But while EAS operational plans are being revised, some people heavily involved in emergency alerting have a tendency to derail the process. Broadcaster involvement with emergency alerting is best left to distributing the messages. Too many broadcast engineers have the misguided

view of broadcasting being the sole source of emergency alert information. It is not, nor should it be. Broadcasting is but one means of distributing emergency information to the public. Granted, in a dire emergency, many communications systems are out of action, leaving broadcast signals as the only viable method of mass communication. Even so, broadcasters are still a delivery mechanism, not the information originator.

As Sept. 30, 2011, approaches, I know you'll have more questions about EAS and CAP compliance. We have compiled an EAS/CAP FAQ. We have also gathered and posted information on EAS/CAP equipment. Another resource I recommend is the SBE's EAS Exchange which is an e-mail discussion group for everything relating to EAS.

*Chris Schen*

What's your opinion? Send it to [radio@RadioMagOnline.com](mailto:radio@RadioMagOnline.com)

## Resources

### **Radio magazine EAS/CAP FAQ**

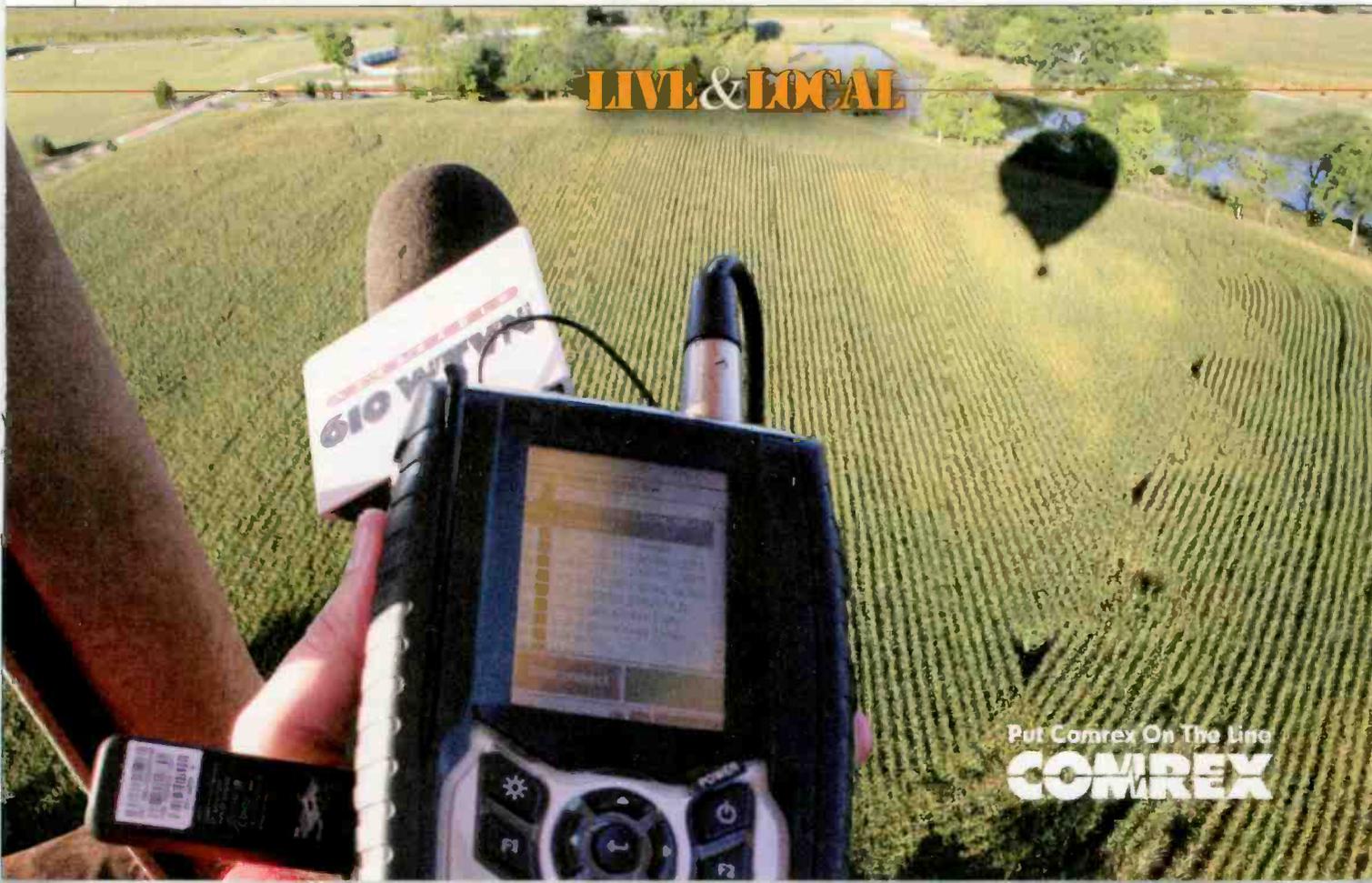
[radiomagonline.com/currents/eas-cap-faq-2010/](http://radiomagonline.com/currents/eas-cap-faq-2010/)

### **EAS/CAP Equipment Rundown**

[radiomagonline.com/currents/eas-cap-equipment-2010/](http://radiomagonline.com/currents/eas-cap-equipment-2010/)

### **SBE EAS Exchange**

[www.sbe.org/eas\\_exchange.php](http://www.sbe.org/eas_exchange.php)



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## Starting a new business

By Kevin McNamara

**W**orking for yourself can be liberating and terrifying at the same time. Perhaps you have already joined the ranks of "self-employed" and work directly with a client or two while still employed, or maybe you are thinking of venturing out on your own. In this economy the latter may be a result of you being (or expecting to be) the victim of a reduction in workforce.

The good news is that establishing a business is fairly easy, but running it, and more importantly keeping it running, is the hard part. Statistically, three out of 10 small businesses do not exist after two years and five of 10 fail after five years. According to the U.S. Small Business Administration (SBA), the primary reasons for failure of these businesses are competition, poor marketing, lack of experience, insufficient capital (money), poor location, poor inventory management, over-investment in fixed assets, poor credit arrangements, personal use of business funds, unexpected growth and low sales.

Planning for a business is the most critical part of a new venture. There are a few additional pitfalls to avoid.

*Starting a business for the wrong reasons:* Unlike in movies, the real world doesn't respond well to the "build it and they will come" mentality. Sometimes what you think may be an important service (or product) is not as valuable to a potential client. If you have a service or product that someone wants, how does your idea of the value (read money) line-up with a potential buyer's view?

*Falling in love with your idea:* Don't fall into the trap of "falling in love" with your idea without being absolutely sure the potential market for that idea has also bought-in. Do not ever assume that a client needs your services. This is a common trap I've seen broadcast engineers fall into, when trying to market services to stations.

*Becoming a specialist:* By specialty, I'm talking about the person who is the greatest transmitter engineer, or can set up processing beyond the limits of mortal humans, or can modify audio equipment so any dog within earshot of the radio will bark – you get the picture. While on the surface having a specialty seems highly marketable, it severely limits your opportunities to sell other services that you may be equally capable of providing.

*Becoming a generalist:* The generalist knows everything about everything. In some cases he also has his colleagues believing this; however, in practice much of his knowledge is limited to only the highest levels of a particular subject. When

they try to put it into real world practice, these people tend to fall short on the deliverable.

*Being sloppy:* I've run into some very talented people who are either incapable or for whatever reason unable to work neatly and efficiently. For example, whether you are wiring a circuit board or an entire facility, it should always look professionally built. During a project, is the work area kept clean and safe for other people occupying the area? Are you (and your employees) dressed appropriately and professionally for the particular job? And have you provided complete post documentation to your customer? How many engineers (and service companies) have you run into that believe not providing documentation to an employer or customer ensures that they will get some kind of job security? This never works!

*Keeping commitments:* You have heard the phrase "Over commit and under deliver." Unfortunately this is all too common, especially among small business start-ups. There is a natural tendency for a new business owner to make promises in order to get new business. Don't do this – unless you want to be sure that the business will fail quickly. Here are the likely scenarios you can expect with a poorly crafted proposal:

You provide a proposal, the customer (who has some experience) already knows the proposal is flawed either disqualifies you for lack of experience, or worse case, the customer accepts your flawed proposal, you both sign a contract and they wait until you fail. Now you could be on the hook for some legal/financial issues and have your reputation pretty much destroyed.

Make sure you have a complete understanding of the work the customer desires, define exactly what the scope of work entails and be certain both parties are in agreement. Have a clear understanding of all other limiting factors such as access, time period you can work, who purchases materials, etc. If this work is performed under a contract, I suggest letting an attorney review before signing anything.

### Have proper licenses and insurance

This may seem obvious, but before engaging in any work for a paying customer, be certain you are properly covered with the appropriate insurance products. You should engage an insurance



# MANAGING TECHNOLOGY

agent that specializes in business coverage. This is a very litigious world and you need to ensure that you and your family are protected.

Also ensure that you have the proper licenses and certifications (if required). As an example, you are contracted to find land in order to move a transmitter site. In most states unless you are a licensed broker in that state or an employee of the client, it is illegal to represent a third party in the transaction. Also be careful when you are dealing with construction for a third party, doing things like electrical work could land you in trouble, particularly if that work causes some damage in the future. Unless you hold a valid Professional Engineers license in the state you are working, stay away from all things structural, mechanical and electrical, that fall under the applicable building codes.

## Create your business plan

The reason I started this article pointing out the pitfalls is to reinforce the idea that all good businesses start with a strong written business plan. A good starting point is the SBA's website, [www.sba.gov/smallbusinessplanner/index.html](http://www.sba.gov/smallbusinessplanner/index.html).

A good business plan should contain the following information: Executive summary,

company description, product or service, market analysis, strategy and implementation, Web plan summary, management team, and financial analysis.

These are essential not only to form the basis of how you will operate your new venture, but to be able to secure financing in the future, which will be necessary to grow the business. The business plan should also be written in a manner where you can identify measurable benchmarks that give you a tool to understand the performance of the business against your original expectations. This will allow you to make changes as needed to achieve your end goal.

## Establishing the business

As I said at the beginning, establishing the business is fairly easy these days. You will need to establish the business structure of the company i.e. sole proprietorship, LLC or corporation. Each of these has certain advantages depending on your situation. I recommend you consult an attorney and search the many resources on the Web to see which is right for you.

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

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## BROADCAST EQUIPMENT SOLUTIONS

# LPFM/FM translator standoff continues

By Harry Martin

**T**here has been no movement at the FCC in the on-going battle between, on one hand, LPFM interests, and, on the other, broadcasters seeking to protect their rights to FM translator facilities. At stake is whether the FCC will adopt a "cap of 10" applicable to still-pending applications for FM translators, thereby freeing spectrum for LPFM, and at the same time give LPFM applicants priority rights over long-pending FM translator applications.

*FM translator application flood:* This deadlock began to develop shortly after the FM translator window in 2003: In that window approximately 13,000 applications were filed, reportedly far beyond the FCC's expectations or processing capabilities. Nevertheless, the Commission managed to process approximately 6,000 of the 13,000 applications, mostly "singletons," by the end of 2007. This left 7,000 applications, most of which are mutually exclusive with others and thus will have to be processed through comparative "points" hearings. Of these, approximately 4,000 are attributable to only two applicants.

LPFM interests have a stake in this matter since they use the same channels as FM translators. Thus the Commission is reluctant to open an LPFM applica-

tion window with 7,000 translator applications still pending. Under current rules the pending translator proposals have cut-off rights that would preclude later-filed mutually exclusive LPFM applications.

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the Commission suspended the cap to afford it time to review the petitions for reconsideration. Nothing of significance has happened since then except the FCC's decision to allow AM stations to broadcast over FM translators. This rule change has heightened interest in FM translators, but has not produced the needed prioritization between LPFM and translators – or an application cap.

*Compromises proposed:* This year, Educational Media Foundation on the translator side and Prometheus Radio Project on behalf of LPFM interests, submitted a joint proposal to resolve the conflict. They suggested that the FCC scrap the cap of 10 and simply hold all pending FM translator applications in abeyance while opening an LPFM filing window. Those LPFM applications that conflicted with pending FM translator applications would be given priority, and the conflicting FM translator applications would be dismissed. This presumably would have left EMF and others with far more than 10 opportunities.

After objections to this plan were received from NPR and the NAB, among others, EMF and Prometheus supplemented their plan. The supplement provided that parties with fewer than 10 translator applications could pick one of their applications for grant, thereby getting at least one new translator, and then the Commission would open an LPFM window that included an LPFM priority vis-à-vis pending translator applications.

A coalition of commercial broadcasters opposed this modified proposal, and urged the FCC to proceed with processing of all the pending applications after first opening a settlement window among translator applicants. Such a settlement window, it was urged, would considerably reduce the number of pending applications.

*Still no movement:* There is no indication from the FCC as to when it will proceed or whether any of the compromise proposals will be favored. While FM translator applicants have been awaiting action since March 2003, 1,100 full-power NCE FM applications, filed four years later in October 2007, have been granted. And LPFM applicants have been waiting for their first window in nearly 10 years, a window that will not be opened until the FCC reaches a decision regarding how many FM translator applications will be processed, under what priority scheme.

## Dateline

For noncommercial radio stations in Kansas, Nebraska and Oklahoma their biennial ownership report deadline is Feb. 1.

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

The radio station license renewal cycle begins again in 2011, with the first batch of renewals due on June 1, 2011, for stations in D.C., Maryland, Virginia and West Virginia.

tion window with 7,000 translator applications still pending. Under current rules the pending translator proposals have cut-off rights that would preclude later-filed mutually exclusive LPFM applications.

*Cap of 10 debated:* A cap of 10 applications was proposed by the FCC in December 2007, in an effort to break the log jam. Under this proposal, applicants with more than 10 translator applications still pending would have to select their favorite 10 and the remainder would be dismissed. With two applicants accountable for 4,000 of the still-pending applications, this approach would presumably have trimmed the backlog by more than half.

A number of broadcasters with more than 10 pending applications sought reconsideration of the Commission's 10-application cap. By April 2008,

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

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# Microphones

By Ron Bartlebaugh, CBNT

**M**icrophones are, perhaps, one of the most taken-for-granted electrical devices ever developed for wide-spread use. They have been used to guide military troops in times of war, provide millions of play-by-play sports broadcasts, announce details of Presidential candidate races—and Presidential passings, and for the transmission of trillions and trillions of telephone calls. Microphones have been used for Earth-to-space communications and Moon-to-Earth communications when Neil Armstrong first set foot on the Moon on July 20, 1969. Our world would certainly be a bit quieter and less informed if it weren't for the invention of the microphone. Throughout this article we will look at microphones of the past, present, and, with a bit of visionary imagination, the future. Because this publication is focused toward the radio broadcast industry, we will journey in that direction as well.

### Past

A microphone is defined as an instrument capable of transforming sound waves into changes in electric currents or voltage as used in recording or transmitting sound. According to history, the term microphone was first coined by Sir Charles Wheatstone in 1827 and was used to describe a stethoscope-type device he had developed to amplify weak sounds. The word is Greek in origin with "micro" meaning small and "phon" meaning sound. In 1876 Emile Berliner invented a microphone that was used as a telephone voice transmitter. The patent rights to that invention were then sold to the Bell Telephone Company for \$50,000.

Inventor David Hughes is credited with inventing the carbon microphone in 1878. Early carbon microphone development supported the telephone and broadcast industry through the first several decades of the 20th century. While carbon microphones were widely used in broadcasting until the late 1920s, they continued in use in the telephone industry up until the 1980s when the use of miniature electret condenser microphones began.



A look at the past, present and future of one of the most versatile inventions in history



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# Microphones

Ribbon microphones came into play in the 1920s when the RCA Company developed its first version known as the PB-31/PB-17. These were replaced with the Model 44A and then later an improved magnetic material brought about the model 44-B/BX. Early ribbon microphones used field coils and permanent magnets. Later models used



double ribbon elements. In later years, the RCA Model 77 ribbon microphone became the most popular model for recording and broadcast because of its smooth sound and directional pickup patterns. The company went on to produce many other ribbon microphone models that have to this day remained staples of the early broadcast and recording industries and are dearly cherished by collectors worldwide. RCA terminated production of their microphones in 1973. Ribbon microphones of various brands have enjoyed a recent revival in the vocal and instrument recording markets with over two dozen new models showing up in the past two years.

Over the expanse of time, dynamic microphone elements have become one of the more popular types.



Invented in 1897 by Ernst Siemens, the first commercially available dynamic microphone was the Western Electric Model 618-A introduced in 1931, a mere nine months before the RCA 44A.

In 1964 Bell Laboratories was awarded a patent for their creation of the electret microphone. That technology allowed for the manufacture of microphones of greatly reduced size, lower cost, improved reliability, and much-improved frequency response. Improvements to electret condenser microphone technology occurred over the following decades. The two most popular microphone technologies in use today are dynamic and condenser.

Condenser microphones, when compared to their dynamic cousins, are more sensitive to sound, typically have a greater sound output level, higher frequency response range, and lower noise output content. Because of their lighter weight elements, a condenser microphone will more quickly and accurately react to rapid changes in sound dynamics such as volume and rapidly changing music transients. On the

down side, condenser microphones are more sensitive to incoming volume. Their output may become distorted if placed too close to a sound source whereas most dynamic microphones can typically be placed up against a source without creating sound distortion. Most professional condenser microphones require a +48V phantom power source while dynamic microphones do not. The phantom power source is usually derived from an audio mixing device to which the microphone is connected, although external phantom power sources are available. Care should be taken to assure the manufacturer's recommended phantom power voltage is reaching the microphone in order to avoid poor microphone performance – typically in the form of lower output and higher noise level.

Condenser microphones typically come in two forms: large or small diaphragm. Whereas large diaphragm condenser microphones are known across the industry for creating a warm sound, the small diaphragm microphones will typically provide a better response to musical transients and an overall smoother and somewhat wider frequency response.

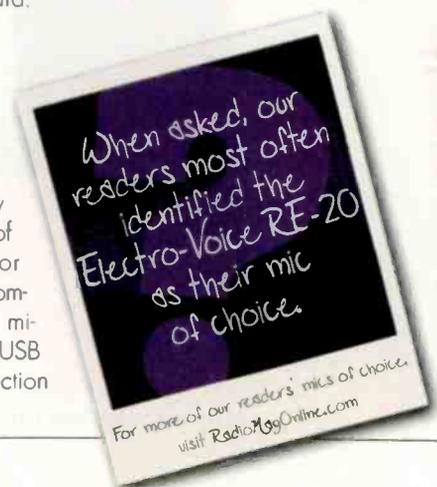
Dynamic microphones are traditionally more durable physically and far less susceptible to moisture when compared to condenser microphones. While dynamic microphones do not have the wide, smooth frequency response of a condenser mic, they are capable of withstanding far greater incoming sound levels making them a good choice for miking very loud vocals and instruments.

Condenser and dynamic microphones both have similar sound pickup patterns. An omni-directional pattern will allow sound to enter the microphone from any direction (360-degree acceptance angle). A uni-directional cardioid pickup pattern microphone typically allows sound to enter into the front of the microphone (180-degree acceptance angle) but minimally accepts sound from the back. A hyper-cardioid pattern allows even less sound to enter the front of the microphone and practically no sound to enter into the back of the unit.

There have been many microphones introduced throughout history that have become industry favorites. Models such as the Electro-Voice 635 in earlier days and the RE-20 in later times are well established in the broadcast industry. And, for stage and high-level vocal recording, the Shure Model SM58 has become a tasty favorite of vocalists throughout the World. And Sennheiser's Model MD-421 dynamic, now celebrating 50 years in the marketplace, has long-served as a studio standard.

## Present

Modern day applications have driven the market toward the creation of new styles and types of microphones. For podcasting and computer recording, microphones with a USB output for connection



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# Microphones



Samson CO1U



Shure PG42USB



Blue Microphones Snowflake



Audio-Technica AT2020 U



Blue Microphones Yeti



Samson G-Track

directly to a computer are now in high demand. Available models include Audio-Technica's AT2020 USB side-address cardioid condenser, Shure's PG42USB large diaphragm condenser microphone, Blue Microphone's Plug 'n Play, Snowflake Portable USB, and Yeti microphones, Samson's CO1U condenser, its G-Track, and Go Mic models, the Rode Podcaster large diaphragm model, and AKG's Perception 120 to mention but a few. Just like standard microphones, not all USB output microphones are created equally. USB converters can and will sometimes cause unwanted audio artifacts such as digital noise and other unusual sounds, so always be cautious when purchasing a product. Many standard



Rode Podcaster



AKG Perception 120



Samson Go Mic

Another application for a standard dynamic microphone is with JK Audio's BlueDriver, a Bluetooth device that attaches to a microphone's XLR connector. When paired with a Bluetooth-enabled cell phone, the device's 3.5mm jack provides a mic level signal suitable for recording along with cell phone audio. Devices of this type provide versatile and economical field operations for news gathering – especially when paired with one of those long-time resident dynamic microphones that have been lying around radio stations for many years.



Tascam US-122mkII



M-Audio Fast Track Pro



JK Audio Blue Driver



Shure X2u

microphones can now be adapted to having a USB output with the addition of an external XLR-to-USB adapter such as Tascam's US-122mkII which offers two microphone inputs, two line inputs, on-board phantom power, a high impedance instrument input plus MIDI in and out. Shure offers the X2u, featuring a headphone jack with volume control, integrated preamp, monitor mix control, 16-bit 48kHz sample rate and +48V phantom power. Others such as M-Audio's Fast Track Pro offer two front panel mic or line inputs, on-board phantom power, inserts for outboard effects, balanced or unbalanced analog audio outputs, S/PDIF digital in and out, MIDI in and out, and more.

## Future

As we spend the present day venturing through the maze of microphones, we come to the end of the trail where we catch sight of Holophone's unique lineup of surround sound recording microphones, from its 7.1 channel Model H2-Pro to the H4SuperMini and the PortaMic 5.1 portable units. And, peeking beyond the trail's end toward the future of what many microphones might someday become, we see the recently announced Squarehead Technology AudioScope, an array of 315 microphones that can hang high above major sporting events to be used to pick out one voice or event-related sound source from within an environment of thousands of persons. The company uses sophisticated signal processing algorithms to isolate and process the sound bringing it into crystal clear clarity.

My hope is that you have enjoyed our journey over the road of microphone history that led to a drive through the fields of present day trends in technology and on to a peek into the future. Microphones of all types and sizes, including some not yet invented, will continue to be used to bring us day-to-day news and information, entertainment, and, most importantly, for documenting today's events for tomorrow's history books.



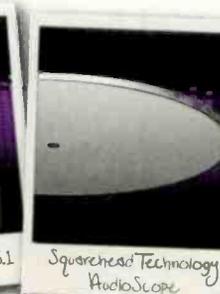
Holophone Model H2-Pro



Holophone H4SuperMini



Holophone PortaMic 5.1



Squarehead Technology AudioScope

Bartlebaugh is director of broadcast engineering, WKSU stations/Kent State University.

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## Small Town

# Big Ideas

### An AM/FM pair in southwest Missouri rebuilds right

By Chriss Scherer, editor

Life in a small town is different than in a big city. There's a strong sense of community, and that community can become almost an extended family through its radio stations. This is what I saw when I visited adult hits KMXL-FM and adult standards KDMO-AM in Carthage, MO. Co-owned since the FM signed on in 1972, the two stations have a strong presence in the Joplin market and compete against several dozen other stations.

KDMO signed on in the 1940s. Current owner Ron Petersen Sr. bought it from his mother a few years after she purchased it in 1962. In 1979, the stations moved to their current studio location in Carthage. In 1989, the station moved its transmitters to a site about three miles west of the studio.

The KDMO-AM control room

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**The KMXL-FM studio is the same as the production and AM studios, with the addition of a reel-to-reel.**

After 31 years, the studios were ready for an update. Small upgrades were made over time, but the aging Autogram consoles and years of wiring updates had seen their better years. For the owner, a complete infrastructure rebuild made the most sense. The owner's son and station manager, Ron Petersen Jr., began working with station Chief Engineer (and AM morning man) Glen Rowe and contract engineer Lee Wheeler to lay the plans for a rebuild.

### First steps

The first upgrade was made in 2009 when the stations replaced the Broadcast Electronics AV100 automation

with AudioVault Express. In February 2010, the heavy work on refurbishing the studios began. The biggest change for the stations was to migrate to a networked audio infrastructure. To do this, the Wheatstone Evolution series E-4 consoles and WheatNet-IP blades were chosen as the backbone. In addition, new Vorsis M1 mic processors, Heil PR40 mics and Designcraft furniture were purchased.

Because this was an in-place upgrade, the old studios would be shuffled while new studios were built. It seems the old consoles knew their retirement was imminent because the number of equipment problems increased as the project unfolded. From February to June, the two stations stayed on the air without interruption. To start, the FM was put on the air from the production studio. The FM studio (in the middle of the three) was rebuilt. Once the FM was completed, the AM moved to the new FM studio so the AM studio could be rebuilt. Once the AM studio was finished, the AM moved home, the FM moved to its new home and then the production studio was rebuilt.

The old system of switching studios with Bud box-mounted switches was slowly replaced by mouse clicks. The WheatNet-IP Navigator software sets up the audio routing paths and now makes it very simple to switch studios and feeds when unique changes are required.

The original design layout from 1979 had each studio acting as a separate island. STL transmitters and other equipment were located in individual studios. While the two-station combo didn't require a dedicated master control, one rack was placed in the AM studio, which is slightly larger than the other two. This rack houses the STLs, some processing, modulation monitor and some switching equipment for the operation.

### Quick turnaround

The four-month turnaround was an orchestrated effort. As wire was pulled and furniture placed, sound treatments and wood flooring were completed. Despite the fast pace, Lee Wheeler still took the time to label every wire. Rather than develop a labeling plan that uses a master guide or book, Wheeler chose to label the end of each wire in plain English. P-Touch labels were applied and covered with clear heat shrink. This makes it easy for Wheeler, Rowe or anyone else to diagnose problems or make changes when necessary.



**Except for an added mic, the production studio is identical to the AM studio.**



A single rack in the AM control room houses the STLs, some audio processing and other central operating equipment.



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## Equipment List

Yellowtec Mika  
Wheatstone Evolution 4, ip88ad,  
ip88e, WheatNet-IP Navigator  
Vorsis VP-8, M1  
Telos 1A2 Interface, One  
Syntrillium Cool Edit Pro 1.2  
Samson Servo 1200  
Sage Endec  
RF Specialties equipment dealer  
Radio Systems DA-4X4B  
Omnimout speaker mounts  
O.C. White mic booms  
Moseley SL9003Q  
Martí STL10  
Henry Engineering Multiphones  
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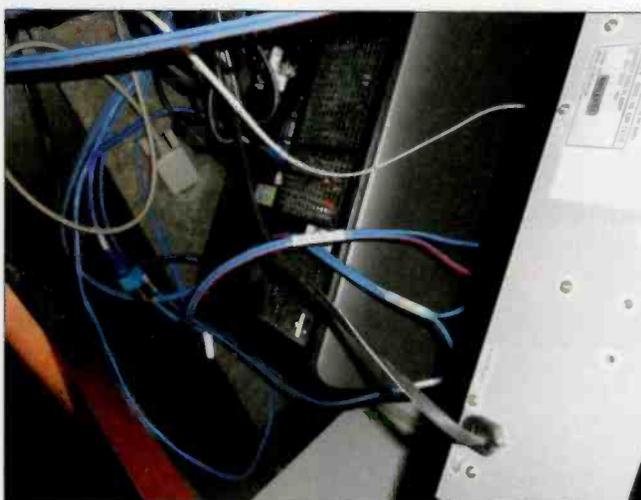
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The two under-counter racks are mounted on slides to facilitate equipment access.



Wire labels make it easy to identify the function of any cable.

After 30 years, there was plenty of old wiring in place as well: some audio, some voltage. Nothing was clearly marked. The rebuild was also a chance to remove all the old wire and start fresh. As old wire was removed, cables were cut one by one to ensure a station was not taken off the air. For the IP audio needs, CAT-6 cable was used throughout the facility.

While the previous studios placed the console against a wall, the new studios' consoles are in the middle of the room so guests can sit around the end island. The new design also places the two racks below the counter on the side against the wall. To facilitate equipment access,

these racks are on rollers and can be pulled forward to access the back of the equipment.

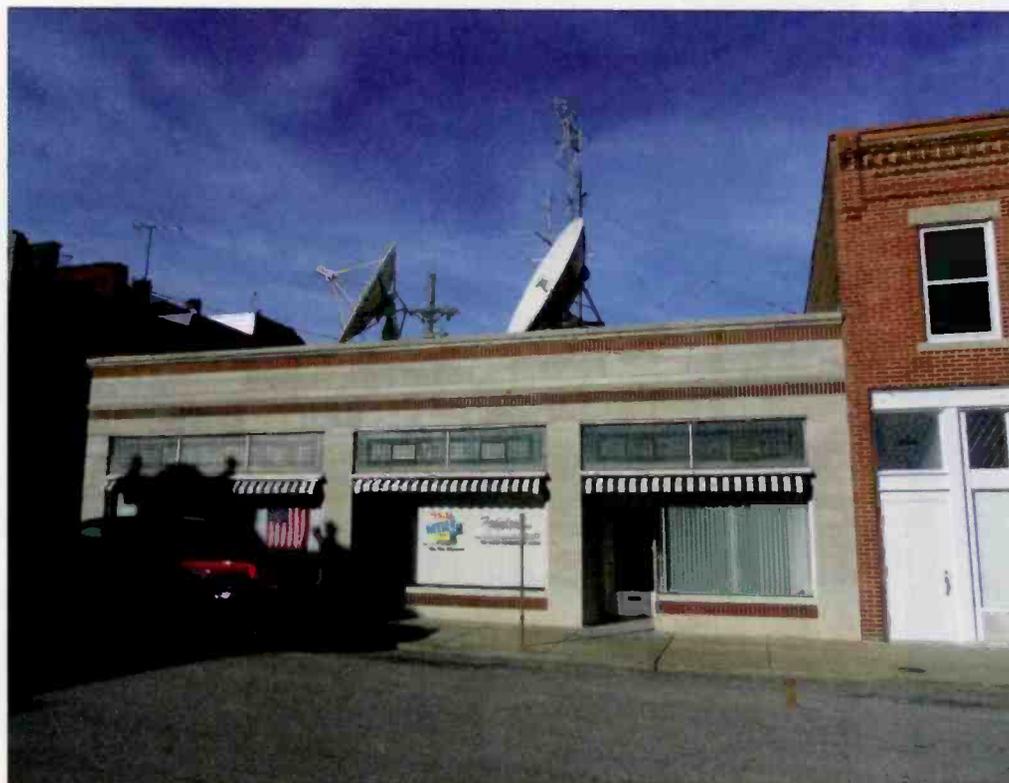
Although an overall internal remodel was undertaken, there was one element left in place. The building has Carthage marble placed on the lower half of the walls all around the facility. Rather than cover this unique building material, which is common in the area, it was left exposed. The floor is also covered in marble, but carpet was installed in the hallway to help control noise as well as provide a non-slip floor. Hardwood flooring was installed in the studios.

The original pressed-tin ceiling is also still in place, but it is covered by the dropped ceiling for better acoustics. The mix of wood, carpet and acoustic tile provides a studio with a little ambience.

### Future planning

Redundancy was a key factor in the rebuild plan. There was some level of redundancy in the old studios, but it was far from easy to use when needed. This redundancy starts in the Audiovault Express servers. Each room has a server, and each station's audio is copied to the other systems. The IP-audio system also allows every source to be available on any console surface, and any studio can feed either transmitter.

The three rooms are also nearly identical. The AM and production studios are the same layout, while the FM studio is a mirror. Each studio has three monitors that



The store-front studios of KMXL and KDMO.



**Cable access in the studio is hidden behind panels below the console.**

show the audio editor, Wheatstone status/meters and Audiovault.

While all the audio is stored and played from the Audiovault, there are three reel-to-reel machines still in place for occasional use. One local program is archived on reels, so they are mainly for transferring that archive into the Audiovault. There are rare occasions when audio is sent on reel as well. A cassette deck and CD player are also in each studio if needed, but see little use.

One eco-friendly upgrade is the studio lighting. Rather than use hot incandescent lights, the station opted for LED lighting. Each studio has two lighting tracks with six lamp modules. Each module uses 3W, for a total lighting draw of 18W. Despite the low draw, the rooms have plenty of lighting for regular use. For additional work light there are recessed incandescent light fixtures in the corners if needed, but they are rarely used.

The complete facility occupies three adjoining store fronts. Nearly one-third of the total space is dedicated to the studios. There is a fourth room that could be used for a studio later. Currently used by the station manager for his office, the walls are finished like the other studios and it faces the street.

While budgets everywhere are tight, it's refreshing to see a local owner reinvest in his efforts, and to do so in a way that shows a dedication to radio. The new studios of KMXL and KDMO are on par with studios in much larger markets, and they're built with the latest technology, which will let the stations keep a competitive pace for many years to come.



See pre-remodel images of the studios at [RadioMagOnline.com](http://RadioMagOnline.com)

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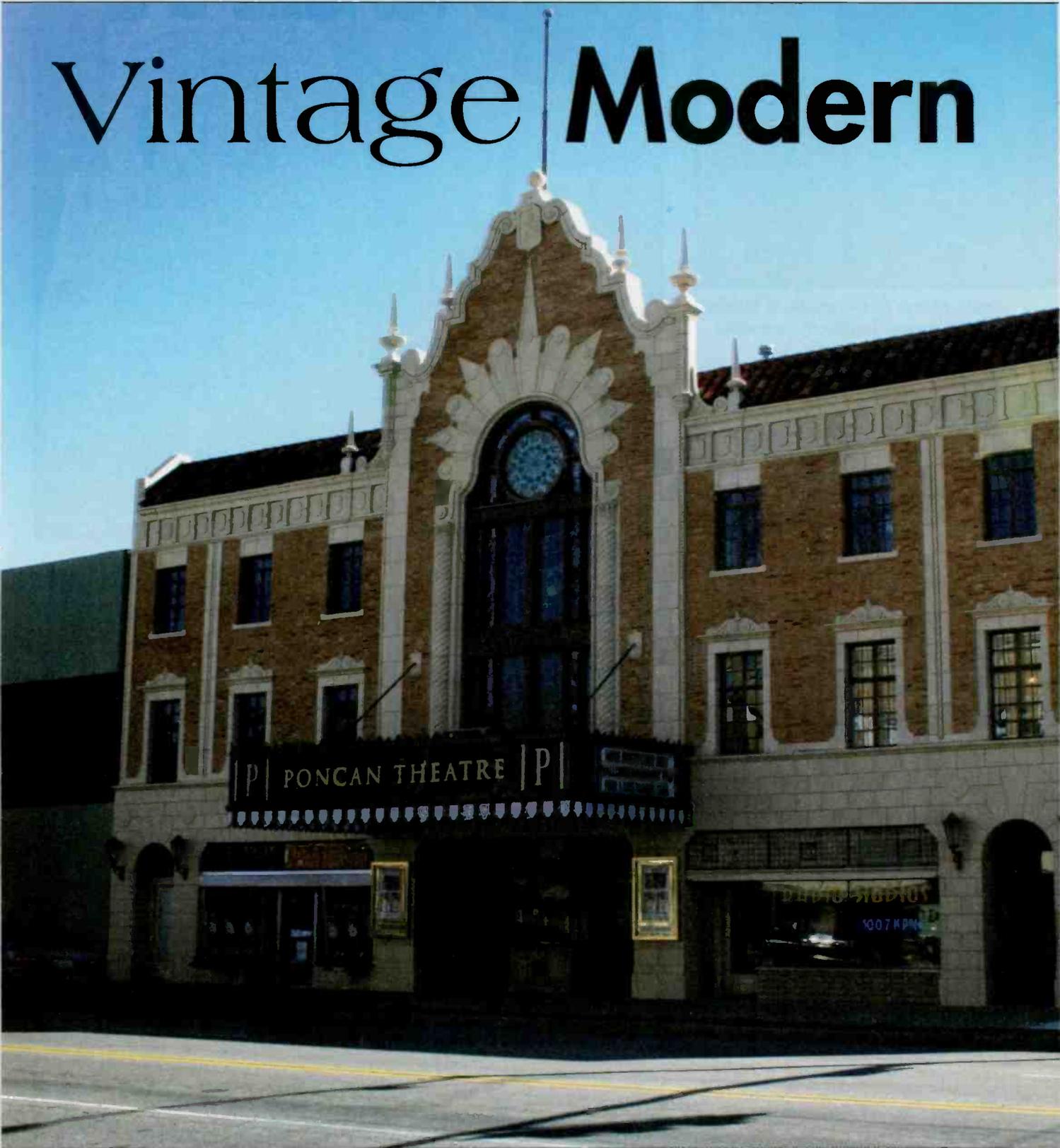
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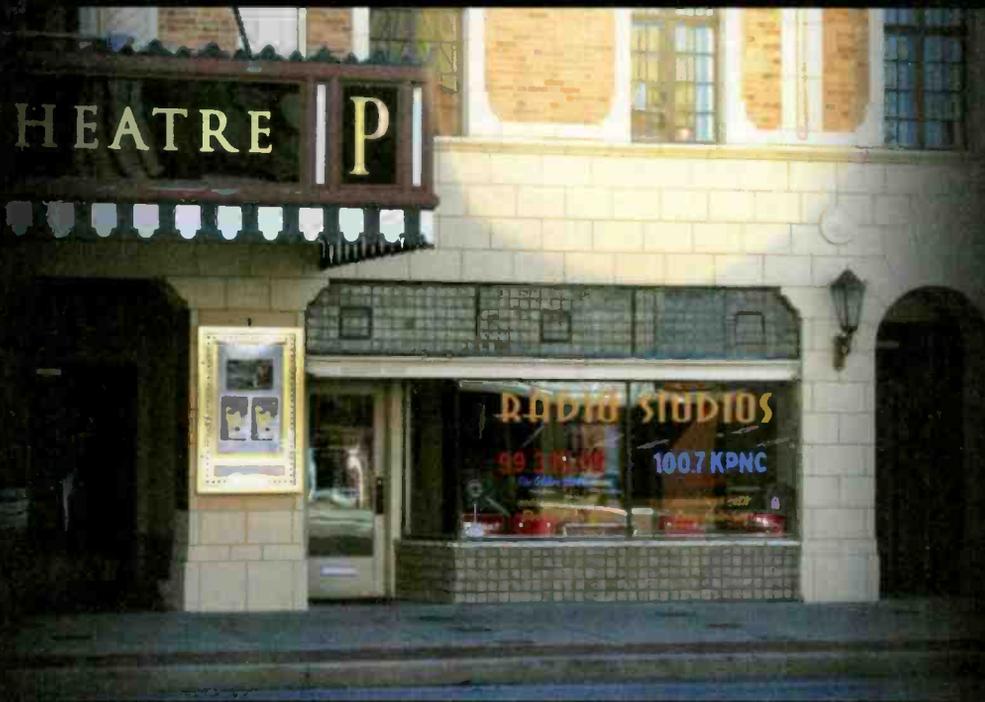
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# Vintage Modern





## Team Radio goes contemporary in an antique 1927 theater

By Ray Klotz, CPBE DRB AMD C3NT

**K**PNC has been a family business for several decades in Ponca City, OK. Add KLOR in Ponca City and KOKB licensed to Blackwell and you have the flagship trio of Team Radio. Team Radio also owns KOSB in Stillwater, OK, and KOKP in Perry, OK. These two are programmed from studios in Stillwater.

Downtown Ponca City was once the studio home of KLOR, but years ago the studios were relocated to the site of the KPNC studios southeast of town. Those facilities grew old and needed an upgrade. Station owner Bill Coleman wanted to remodel the former studio site downtown. However, a storm in July 2009 left the brick front of the building lying in the street. That was that. Coleman still wanted to be downtown and found space available in the Ponca Theater.

## No reproductions

Built in 1927, the Poncan Theater is a fully functioning stage theater. The theater itself has been renovated in recent years and has most of the original woodwork, decor and accessories. It is home to the largest collection of original classic movie posters in the country. Amid original period items, the stage equipment, lighting and sound are state-of-the-art.

The radio station occupies part of the ground floor and the street side of the balcony level. Two on-air control rooms are on the ground floor and are fully visible from the sidewalk. Upstairs is the TOC, production room, programming, sales and management offices.

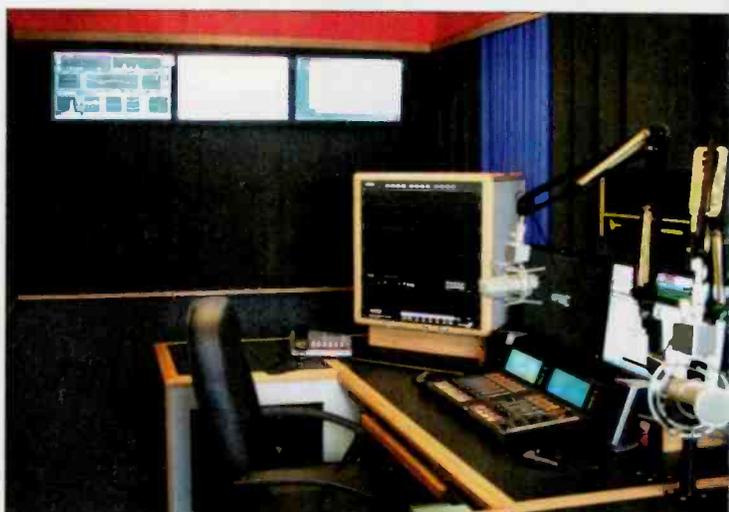
With all the antiques in the theater, which is on the National Register of Historic Places, the building owners wanted us to either keep original antiques in our decor or be modern in contrast. For example, if an antique lamp is used, it must be from the 1920s, not a reproduction of a period piece. We went modern – very modern. This is a state-of-the-art facility.

cables were connected. Every cable is numbered and the station is fully documented. Sierra Multimedia engineers and technicians also designed and installed the IT systems.

## Details

The operation centers around Logitek IP-based Jetstream-Mini audio engines and Remora 10-fader consoles. The Jetstream chassis is 2RU and is convection-cooled, thus quiet in the room. Logitek's intention was for them to be mounted in each studio and then networked. However, in this installation there are very few audio components actually in the studios so it was more cost effective to have three Jetstreams rack mounted in the TOC and all audio home-run to there. Only the microphones and their processors, CD player, monitor amps and speakers and headphone amps are actually in the studio. All of the computers, monitor receivers, the Comrex STAC phone systems, EAS and other critical equipment are all in the TOC.

Each Jetstream audio engine has slots for eight input or output cards, either analog or digital. A gigabit network



**The KLOR control room provides for three to four guests. Wall-mounted computer monitors provide Blinky-Flashies as a high-tech way of showing off for viewers. KPNC (right) is a mirror image of KLOR.**

Construction in the building posed some difficulties. Several structural steel columns were where we wanted to put walls. The downstairs area was completely rebuilt within the space allotted. The two on-air control rooms were built as isolated boxes touching only the floor. Walls that look like they are in contact with the building walls are not actually touching. A small gap separates them. Upstairs the production room had very little done construction wise. Carpet, ceiling tiles and acoustical wall treatment provided acceptable results. The TOC has a separate air conditioning system for the equipment.

The facility design and system integration was handled by Sierra Multimedia in Bella Vista, AR. After the design phase, local contractors were used for the construction. All of the station equipment was shipped directly to the Sierra facility in Arkansas. It was there that the racks and studio cabinetry were assembled, equipment mounted, wired and tested. This was a complete fully functioning radio station. Once complete, it was shipped to the Poncan Theater for final installation. All wiring plans were completed before any

connects the Jetstreams together so that any input can be used in any studio or routed to any output in the system.

The entire studio installation is wired using Studio Hub+. This uses shielded CAT5 cables with RJ-45 connectors. RJ-45 patch panels from Studio Hub are used between the TOC and each studio. Since the Jetstream inputs and outputs are Studio Hub compliant, the wiring went quickly.

Three Broadcast Tools switchers are used for the transmitter feeds, one for each station. Included on these switchers are all three studios and automation systems. This allows total flexibility in using studios for production or doing maintenance as needed. These switchers interface with the Logitek system and operators have control buttons in each studio.

The TOC is also a small room so everything had to fit into three racks. The front side of the first rack is for transmitter-feed switching and engineering functions. A 22" monitor is rack-mounted along with a pull-out keyboard drawer and rack-mounted KVM switches. Other devices and 22 PCs can be monitored and administrated.

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Jessie Walker, Program Director

## **DMS Broadcasting, San Francisco, CA**

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available in several studios for redundancy and convenience, almost all of the computer's keyboard, mice and monitors are split. The use of wide-screen format monitors throughout the station brought out one problem. Computer monitors report to the computer their make, model and resolution through a protocol called EDID. Computers then set the video card settings accordingly. On many systems, if the computer thinks the monitor is a 4:3 aspect ratio monitor, it will not even offer wide-screen formats to choose. With VGA splitters and KVM switches that do not pass the EDID to the computer, 4:3 formats cannot be chosen. The reason this is a problem is that the monitor will stretch the image – circles become ovals.



The production room on the second floor is adjacent to the TOC.

The solution to this was to trick the computer into thinking a monitor of the desired format and resolution was connected directly to the computer. This was accomplished using a device from Gefen called a DVI Detective. Once set it always reports to the computer that the monitor is what you want it to be.

### From here to there

The KOKB transmitter is 15 miles northwest of the studio. The Klor and KPNC transmitters are collocated north of Ponca City. Due to the buildings around the Poncan Theater downtown, a normal 950MHz STL path is marginal at best. Also, KOKB normally carries programming originating at the Stillwater studios. We had to get creative.

Tieline Bridge-IT pairs are used for an intercity relay from Stillwater. This feeds the studio-quality audio over the Internet with very low delay. KOKB's main studio site is the Poncan Theater so that programming must pass through the new studios.



Graham Studio's cabinetry, racks and the electronics were shipped to Sierra Multimedia in Arkansas for assembly, wiring and testing.

## Equipment list

- APC UPS
- Broadcast Tools ACS 8.2+RJ, SM-III
- Burk ARC-Plus, AutoPilot Plus
- Cisco RV082/042
- Comrex Stac
- Denon DN-C640
- DM Engineering Multiple Station EAS Adapter
- Enberg Alert Monitor, Studio Warning Light
- Gefen DVI Detective
- Graham Studios cabinetry
- Heil Sound PR40
- Logitek JetStream, Remora 10
- Microgen TS9080
- Middle Atlantic racks, panels & hardware
- Netgear GSM7224
- Network Technologies KVM cables and splitters
- Pilot WDM fiber/copper gigabit media converters
- Radio Systems Studio Hub+
- Sage Digital Endec
- Sony XDRF1HD
- Startech VGA splitters & KVM switches
- Tieline Bridge-IT
- WRN program automation computers

Since a good path is not available, another pair of Tieline Bridge-IT units are used as the STL.

Because there is not a good STL path from downtown to the Klor/KPNC transmitter site north of town, another approach had to be found. While we could use an IP system over an Internet connection, we had a better idea.

### Have you had your fiber today?

Ponca City is a very technologically advanced community. The city has provided city-wide free Wi-fi. It has also wired most of the downtown area as well as other locations with fiber optics. Since the city has some of its radio equipment on the Klor tower, fiber also goes to the transmitter site. A deal was made to use two strands of fiber between the Poncan Theater and the transmitter.

It is most common to use two fiber strands to make a computer network connection – one in each direction. However, in

this case Planet WDM media converters were used to provide two separate and independent bidirectional 1GB network connections. One is used as an extension of the main network providing Internet and remote control access for the site. Installation of the media converters and all of the station's fiber was also completed by Sierra Multimedia technicians.

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### Sierra Multimedia

When Sierra Multimedia was chosen by Team Radio in Ponca City, OK, as the integrator for its new studio installation we started by working with management, the air staff and the engineer that normally handles their facility. The design criteria include the owner's desire to have a true showcase in downtown.



He wanted a lot of flash and interest viewable from on the sidewalk outside. In addition, the facility had to be versatile serving needs today and in the future. For that, an IP-based and software configurable console/routing system was chosen. The use of fiber optics for the STL was the frosting on the cake, a modern solution to a downtown location with no line-of-site to the transmitter.

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**The TOC holds all the audio, computers, switchers and IT for the studios and offices.**

An additional Jetstream audio engine was placed at the transmitter site connected to the others over one of the fiber-based network connections. This serves as the STL. Because of the topology of the networked engines, the audio literally comes right out of the console into the processing – at the transmitter site! Connections to the transmitter equipment itself were done by the station's regular engineer, Tim Diehl of RF Solutions in Tulsa.

Due to the buildings downtown, satellite dishes could not be installed at the studio. Three dishes are in use at the transmitter site. Audio is connected to the Jetstream there and is available in all of the studios downtown.

Station owner Bill Coleman wanted a showcase. Large windows at one end of the on-air control rooms make the studios easily viewable from the sidewalk. Show business was at the forefront of the design. On the walls opposite the large windows are three large computer monitors. Their purpose is part function, but mostly show. One monitor is a graphical representation of the station audio displaying real-time VU meters as well as fader position and on/off status. Another monitor displays custom AutoPilot screens of the transmitter remote control operation. This screen can also be brought up on a desktop monitor adding keyboard and mouse control for transmitter operation. The third is the display from a Microgen modulation analyzer. This displays many off-air parameters with graphical modulation monitors, stereo image display and a spectrum baseband of the stereo composite. These monitors make up what has become known as Blinky-Flashies. They yield a very high-tech look to the studios. 📺

*Klotz is president of Sierra Multimedia, Bella Vista, AR.*

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## Tips, tricks, hints and more

By Chriss Scherer, editor

### Time-aligned HD Radio

I received an anonymous tech tip from a reader concerning the alignment of the analog and digital streams of an HD Radio transmission. He has had some trouble with the Harris HD Radio Exporter, struggling with time-alignment and intermittent dropouts, especially when used with a T1 link. He reports that herculean efforts have been expended to isolate and correct the problem; but minor time slips still occur over days and weeks, which accumulate over time to a time-alignment problem requiring monitoring and tweaks.

Harris advised him to troubleshoot and co-locate the Exporter and exciter. While this is contrary to recommended practice, it seems to correct a host of little problems. It stands to reason that the data between an HD Radio

Importer and Exporter would be less sensitive to time and bandwidth limitations. It requires that processing and delay be at the transmitter site along with a few other accommodations, but a few engineers have discovered that it makes HD Radio much more trouble free.

The reader does not know if the same situation exists with Exporters from Nautel, BE or Continental. Have you experienced any time alignment issues with your HD Radio equipment? If so, tell us about it.

### No escape from the planet of the apps

The ideas of useful apps seems endless. George Buzunis of Rogers Radio Winnipeg sent a few ideas for handy apps. He starts with two remote desktop apps.



#### VNC Viewer, Jaadu RDP

Remotely access a Windows PC desktop.

#### Ruler

Handy for sizing small items



#### E-Formulas

Handy formulas for Ohm's law, Joule's Law, power and more.



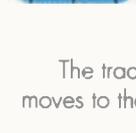
#### IP Vision Pro

Access IP cameras and see who is snooping or lurking.



#### SignalScope

Makes the iPhone a real-time spectrum analyzer and oscilloscope. Also available in Pro.



#### SPL Meter

The traditional sound meter moves to the handheld device.



#### Shazam

Name that tune with your iPhone.



#### FYI Mileage

For keeping track of business miles for mileage reimbursement.



### More power to you

Mike Kernen, chief engineer of the Greater Media Detroit stations, shared some thoughts on a mysterious short-duration dead air problem he encountered. He received a report that WMGC was off the air for about 30 seconds one day. This was too short to trigger alarms and failovers, so he checked the logger to confirm that the silence occurred at 5:06 on a Wednesday afternoon. He could not determine the cause, but suspected it might happen again at some point.

It did: At 5:06 on a Wednesday afternoon two weeks later. He still had no indication of what the cause might be, and at the time he didn't realize it happened at exactly the same time as the interruption two weeks prior. When it happened again two weeks later, again at the same time,

he dug through logs and alarm lists and listened to the audio logger until it was finally discovered that a server in the transmitter room had rebooted at the same time. What would that server and the audio dropout have in common? The UPS. This is when Kernen recalled the UPS performs an automatic self-test every two weeks. Running a manual test confirmed the test fails and the load is dropped for about one second. Naturally, this UPS is the one responsible for guaranteeing that the Optimod and several other critical components at the transmitter site never lose power.

Kernen notes the irony of a failing stand-alone UPS. When it inevitably fails, it does the very thing that its sum total purpose in existence is to avoid: It drops the load.

When is the last time you checked your UPSs?

#### We need your tips!

Ideas submitted to Tech Tips may be suitable to earn SBE recertification credits.

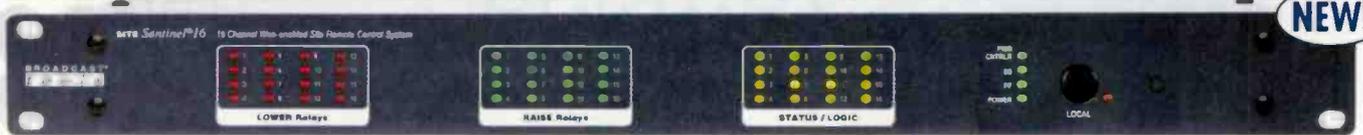
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# Site Control



## WVRC-8 Web-enabled and Voice Dial-up Eight Channel 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.



**NEW!**

## Site Sentinel<sup>®</sup> 16 Web-enabled Sixteen Channel Site Remote Control System



## WVRC-4 Web-enabled and Voice Dial-up Four Channel 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<sup>®</sup> 4 Web-enabled Four Channel Site Remote Control System



## AC POWER Sentinel<sup>®</sup> 2

Remote Power Switch

## AC POWER Sentinel<sup>®</sup> 2 Plus

Remote Power Switch

## I/O Sentinel<sup>®</sup> 4

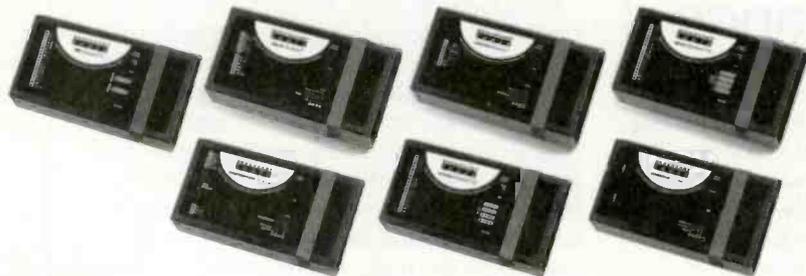
Web-enabled 4 logic/status input, 4 relay output module

## Relay Sentinel<sup>®</sup>

Web-enabled 3 relay module

## Relay Sentinel<sup>®</sup> 16

Web-enabled 16 open collector/SS relay module



## Schedule Sentinel<sup>®</sup>

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Web-enabled 4-port temperature module

## Status Sentinel<sup>®</sup>

Web-enabled 3 status/logic module

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Web-enabled 16-input status/logic module



## VAD-2 Plus

Dual channel Voice alarm Dialer

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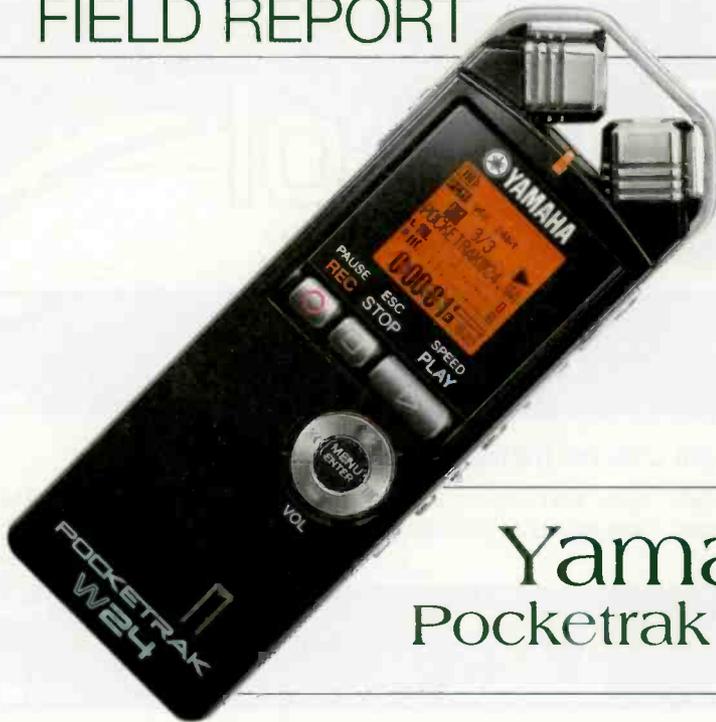


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## Yamaha Pocketrak W24

By Chris Wygal,  
CBRE

I've been in radio broadcasting barely long enough to remember toting a thirty-pound reel deck and mixer to a location only to record two tracks of audio. For the readers who have been in broadcasting longer than I, you can attest to an even heavier, bulkier, more time-consuming way of life.

In recent years, with the availability of computer-based non-linear editing, capturing, editing and distributing audio has become sinfully simple. Recently, I stumbled upon a handheld recording device from Yamaha: the Pocketrak W24. Until now, I have never characterized a piece of equipment as fun. While its functionality and performance are second to none, the Pocketrak W24 is simply a blast.

### In the details

At first glance the Pocketrak W24 is smaller than most TV remotes (1.75"W x 5.0"H x 0.625"D). It comes with a mic stand adapter, DVD-ROM with Cubase AI for post production and editing, a USB cable, a remote control, batteries and windscreen. For typical close-miking during an interview, the windscreen is absolutely necessary. The owner's

### Performance at a glance

- Lightweight and very compact
- Excellent built-in XY mics
- Internal 2GB memory
- Easy-to-read LCD screen
- Easy-to-navigate menu options
- Speaker for listening to audio playback
- Jack for external mic and line sources
- Remote control

manual is loaded as a PDF file on the unit. If the hard copy isn't available, it can be opened from the W24 with a computer. The stand mount allows the recorder to be placed nearly anywhere, even out of reach. The infrared remote control will stop and start recording and playback in addition to adjusting levels for record and playback, up to about 21'.

Two internal mics are situated in a 90-degree X-Y pattern and are surrounded by a protective bar. They perform extraordinarily well and reproduce strikingly accurate spatial imaging. After having undergone a crude left-right test, the stereo reproduction of the recorded live source was very natural. The mics perform true across the 20Hz to 20kHz range and handle high SPLs nicely. When I asked an interviewee to yell into the recorder at

close range (using no auto level control [ALC] or limiting), the resulting audio file indicated no clipping or distortion. Stereo 1/8" mic or line-level input and headphone jacks are available. A speaker is located on the back for playback.

### All in good fun

Now for the fun part. Some handheld devices are laden with unending menu trees to search through for settings and features. This recorder's menu layout just makes sense: It's short, and the most common features are clearly labeled. Multiple MP3 and WAV formats are selectable under the record menu as are settings for the high-pass filter, limiter source select and several other features. One in particular is the voice-activated start, which tells the W24 to begin recording when audio levels reach a certain threshold. The ALC and limiter behave as expected with ultra-transparent handling of transients.

The playback menu features indexing and phrasing (great for indexing interview audio) and EQ settings. The common menu controls internal settings such as the clock, date and time, remote control settings, timer and alarm settings and several other device-management features such as recycle bin settings. Recycle bin? Yes, the W24 has a file folder system, where recorded audio can be placed and designated by their source. The internal mic audio can be placed in folders A-D. Audio captured on the line input is stored in folder L. MP3s and WMA music files will play out of folder M, and M3U music playlists can be stored in folders P1 to P5.

The W24 ships with 2GB of internal memory, but will also accept a microSD card up to 16GB. Depending on the recording file format, this recorder will hold a considerable amount of audio with no microSD card.

# FIELD REPORT

The recorder has a 7/8" by 7/8" backlit LCD screen. The main screen indicates all functions including recording time, audio levels, file name and format and battery life. The front of the W24 is also home to the rec, stop and playback buttons, along with the menu/enter button and the global transport/volume control button. Sliding mic sensitivity (high/low) and ALC controls are on the same side as the headphone jack, and file management buttons, power button and USB/SD card insert slots are on the other side. A hold button is on the back to prevent accidental operation during recording or playback. The recorder accepts one AA battery. The remote control ships with a lithium battery installed.

## Plugging in

Interfacing the W24 with PC or Mac is as easy as plugging in the included USB cable. It appears as a removable disc for dragging and dropping files. No drivers are necessary. This is also how music is added to the playlists, again, making the recorder a fun little gadget to take along.

After a week of experimenting and playing with the W24, I noticed a little bump on the

front of the unit. I eventually found out the bump was the sensor for the infrared remote. Aside from that, most of my questions were answered within minutes of experimentation. It is amazingly easy to use right out of the box. More importantly, the clarity by which the stereo X-Y mics reproduce audio is excellent. For a unit of such diminutive proportion, it is surprisingly robust. For interviewers, handling noise is minimal. For musicians, it has features galore. For recording engineers it's a back saver. The W24 is worth its weight in gold. That's not a lot of gold, but you know what I mean.

## Yamaha

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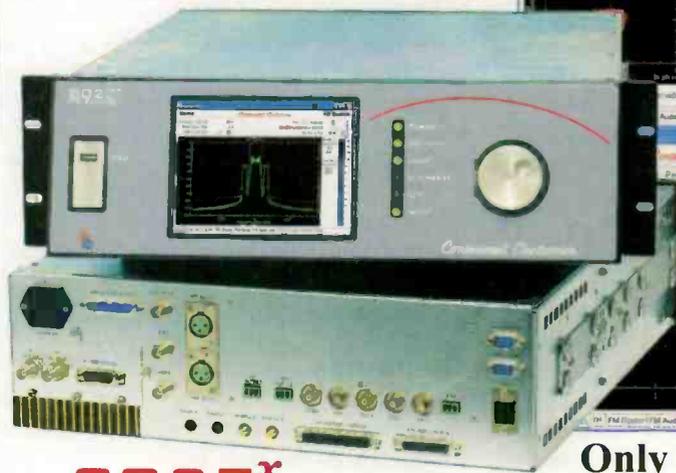
*Wygat is the programmer, engineer and Web designer for Liberty University in Lynchburg, VA.*

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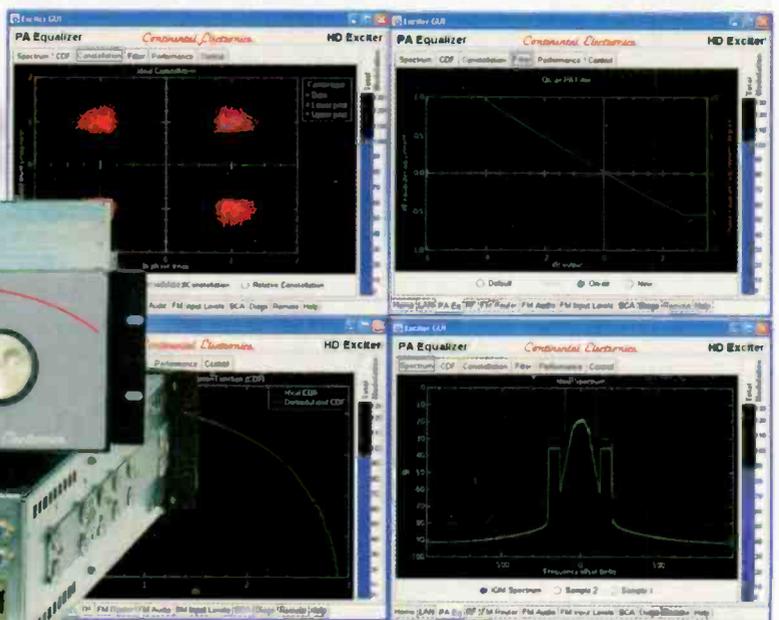


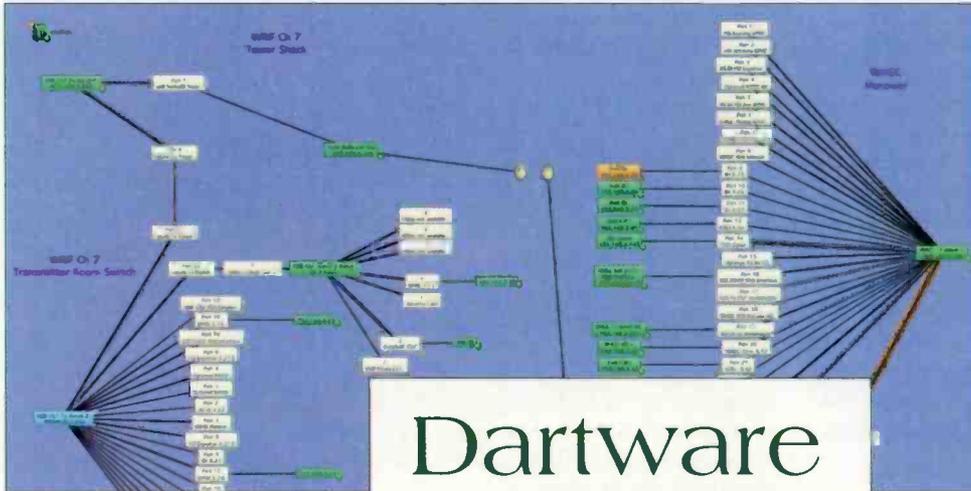
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## Dartware Intermapper

By Mike Kernen

IT is quickly become the primary concern of nearly every radio engineer. Where we once had 3x5 cards, carts, and LPs for our audio sources, we now have an accumulation of 45 computers. Terms like TCP/IP and router have replaced the well-worn phrases of yesteryear like turntable, tape deck, and even CD and DAT machine around my office. The last reel-to-reel and triple-decker were tossed out years ago in favor of the mighty computer.

No surprise though, that this metamorphosis didn't happen overnight. It took two decades from our first humble 2.5Mb/s ARCnet bus network to grow into the GigE spans we now have in place. Today, complex parallel optical technology speeds Ethernet up to 100Gb/s.

Gordon Moore observed that transistor density in integrated circuits had doubled every year since the ICs invention. Liberal interpretations of Moore's law seem to apply everywhere in technology – data density, processor speed, etc. Fortunately, cost has become an inverse function of Moore's Law. We now find ourselves surrounded by computers, network devices, and network-enabled devices.

Like it or not, radio engineers are managing several very complex networks with hundreds of

clients, miles of cabling, and countless switches and routers – a CAT5 high-wire act far above the ground without a net! For all too many of us our network is an inky-black abyss with nothing more than some link lights to indicate its operational status. Our networks are crucial to our business, so I finally installed that net.

accomplishes this oversight with its assortment of probes. Because this software package targets IT management professionals, many of the included probes are for inspecting high availability routers, enterprise class servers, and the like. For radio engineers, the Ping probe and the SNMP Traffic probe are the most useful. I have been buying Layer 3 managed switches for several years. SNMP is generally included in them. Even some broadcast equipment such as the Bird BPME series wattmeter and Wheatstone Wheatnet blades support SNMP. Intermapper's SNMP Traffic probe easily connects and extracts critical data and reports alarms and warnings. PING probes are useful to keep tabs on network-connected equipment that doesn't offer SNMP. I've found it useful for my Burk ArcPlus remote control equipment, which Intermapper polls with a 20B ping every 60 seconds. This "You there?" "I'm here" chatter is completely innocuous to the end systems and introduces negligible network traffic. The indisputable value is that I never wonder if all of its nodes are conscious. Many times I've found a dead soldier on our network only after I've badly needed to communicate with it.

### Performance at a glance

- Critical device mapping
- Continuous monitoring
- Monitors network-connected equipment without SNMP
- Scalable
- Deploys to multiple locations and subnets
- Remote access

clients, miles of cabling, and countless switches and routers – a CAT5 high-wire act far above the ground without a net! For all too many of us our network is an inky-black abyss with nothing more than some link lights to indicate its operational status. Our networks are crucial to our business, so I finally installed that net.

#### Safety net

Dartware does one thing. It makes network-monitoring software. Of particular interest is its Intermapper, which allows accidental admins, such as we, to map critical devices on our networks and have them watched continuously. Intermapper

#### Scalability

Intermapper is licensed by device count so the cost scales with network size. I've settled on 45 devices for the time, but can increase that count by increments of 25, as need demands. A "Five for Free" demo license is available at the Dartware website and is certainly what hooked me. You can choose to let Intermapper discover your network or, like me, you can add devices manually and choose the probe, polling interval, and several other parameters. I particularly like the way it automatically populated the port information

## FIELD REPORT

from my Layer 3 switches. In my meticulous way, I had already used the switches' HTML interface to label the ports and fill all the other specific information such as its location and purpose. Intermapper reads this information and labels the switch diagram accordingly. Neat!

When I first installed Intermapper I used my iMac as a host. Being the computer I use in my daily office work and that it is not on the same subnet as most of the equipment I needed to monitor, I ran into some trouble. Intermapper reported continuous short-term packet loss alerts from random devices without any real rhyme or reason. This was baffling. Everything seemed to be fine, save for the unrelenting alarms to the contrary. As it turns out, if routing demands are too high, our router will discard ping requests as they cross between subnets. For this reason Dartware recommends installing exporters on each subnet you wish to monitor. I simply migrated my Intermapper installation to a Mac Mini that I connected directly to the desired subnet. Problem solved.

Admins can deploy Intermapper to multiple locations and subnets. Exporters can also be installed at remote locations to provide a conduit for monitoring there. An exporter is essentially an Intermapper network node that reports to the Intermapper user console wherever it might be. Dartware also offers Remote Access and Flows products, the latter of which offers analysis and trending of network usage data and is included with the purchase of larger license quantities. I was able to spend a limited amount of time with Flows and can report that it is completely integrated with the main Intermapper program and is very useful for discovering over-burdened network spans and detecting and tracing unwanted traffic spikes.

Reporting of issues and providing a vital viewport into the network is the function of any network monitoring software. Intermapper excels, offering very flexible methods of

### Dartware

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reporting including e-mail, SMS, SNMP Trap, and simply sounding an alarm on the monitoring host. On Mac installations it also supports Growl notifications and adds a little traffic light in the menu bar that shows different colors and icons for depending on network conditions.

So far Intermapper has alerted me to two failing switches and another that simply needed a firmware update. Without it, I would have been very hard-pressed to understand the cause of the intermittent symptoms we were experiencing.

Network monitoring software is an essential component in a mission-critical network. Even if you choose open-source monitoring software you will be doing your company a great service in the yeoman's work we simply call radio engineering. 

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

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by Erin Shippo, associate editor



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Pocket-sized, portable, and battery powered, the Sound on Sound multitrack recorder provides on-board rhythms, effects and an infinite number of overdubs. Capture and review recordings instantly with the built-in speaker and an internal stereo mic. Advanced recording features include unlimited undo/redo, loop recording and sound stretch - adjust the playback speed without changing the pitch. Record and save up to 200 songs in WAV format. Record up to 10 hours on a pair of AA batteries.

**631-390-6500; www.korg.com**

## Audio editing software

**Adobe Systems**



**Audition for Mac:** Adobe Audition for Mac, coming in a future release, will bring modern audio post-production to the platform of choice. Familiar tools for audio editing, multitrack mixing, and recording will meet expanded device support, greater workflow flexibility, and optimized performance. Plus, best-of-breed audio restoration tools make it easy to clean up production audio. A beta of the Mac version of Adobe Audition is expected to be available on Adobe Labs in Winter 2010, providing Mac users with a preview of Audition's audio editing environment.

**800-833-6687; www.adobe.com**

## Sound effects CD

**Music 2 Hues**

**Logos and Bumpers:** "Logos & Bumpers" is now shipping worldwide and is available on Audio CD, or can be downloaded in Mp3 and WAV file formats. This CD of 41 musical logos and bumpers is for those looking for transitional style tracks. These tracks range anywhere from five seconds to more than one minute long for anything from broadcast to multimedia, flash and video productions.

**888-821-7515; www.Music2Hues.com**

## Three-element multidirectional boundary microphone

**Audio-Technica**

**ES963:** With three cardioid condenser elements in a single housing, the phantom-powered ES963 offers a versatile tool for surface-mount installations. Levers on the microphone base allow easy reorientation of two elements to offer 360 or 300 degree coverage. Elements can be powered and used individually or in any combination. Installation and repositioning are quick with four recessed pathways on the base of the microphone that enable the user to route the cable as required to accommodate any installation requirements.

**330-686-2600; www.audio-technica.com**  
**sales@atus.com**



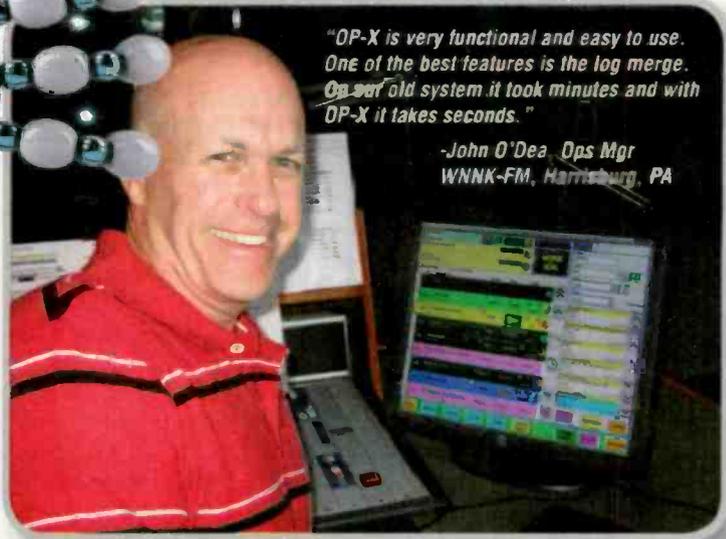
## Exciter

**RVR**



**PTX100-DDS:** PTX100-DDS uses DSP technology complying with all EC, FCC and CCIR standards. It features a built-in digital stereo coder, ITU professional limiter and on-board RDS, and AES/EBU, L/R, mono and MPX inputs, auxiliary inputs for SCA/RDS signals. It is completely microprocessor controlled, easy to program via menu or RS-232, and all main parameters are displayed on the LCD screen. It interfaces with all RVR telemetry systems to guarantee simple remote control of operating parameters.

**305-471-9091; www.rvrusa.com**  
**sales@rvrusa.com**



"OP-X is very functional and easy to use. One of the best features is the log merge. Our old system it took minutes and with OP-X it takes seconds."

-John O'Dea, Ops Mgr  
WNNK-FM, Harrisburg, PA



- Modular Operation in Op-X allows for a tiered system at a fraction of the cost of its 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.

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*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



**Mixers  
Behringer**

**Xenyx Series:** Sporting a wide range of options, the next-generation Xenyx live/studio mixers merge a built-in USB interface, easy-to-use "one-knob" compressors, Xenyx mic preamps and British-style channel EQ. All mixers feature a new studio-grade digital effects processor with 16 editable presets including reverb, chorus, flanger, delay, pitch-shifter and multi-effects (no FX on

1204USB). All models are phantom power-equipped and include a massive software package that features energyXT2.5 Compact Behringer Edition music production software. As an added bonus, all ship with rock-mount brackets.

877-672-0816; [www.behringer.com](http://www.behringer.com); [support@behringer.de](mailto:support@behringer.de)

**KVM extenders  
Gefen**

**CAT5-1600HD, CAT5-5600HD:** The CAT5-1600HD and the CAT5-5600HD each extend high resolution displays using DVI along with hi-speed USB 2.0 peripherals up to 200'. These products replace existing models with a new method of extension, streamlining cabling while lengthening the extension distance. Both use just one CAT-6a cable for hi-res video in place of the previous two CAT-5/CAT-6 cables required, and expand the distance of hi-speed USB 2.0 peripherals to 300'. DVI video at 1920x1200 resolutions can reach 200'. Previous solutions were limited to 150' at this resolution. Another 50' for DVI and 150' for USB makes these products ideal for broadcast markets.

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



**Solid-state  
audio recorders  
Denon Professional**

**DN-F450R, DN-F650R:** Both of these recorders are able to record and read MP3 files and uncompressed WAV files to and from SD or SDHC cards (The DN-

F650R records to USB drives as well). The 1RU DN-F650R has RS-232c and USB keyboard control and a full host of inputs and outputs from AES/EBU to balanced XLR in and out allow for its inclusion into nearly every application. Its playback features also include  $\pm 12$  percent pitch control. The optional RC-F400 remote controller features a large LCD display with an ergonomically designed, intuitive control unit for instant playback of audio or audio elements (sound effects) via its hot-buttons

630-741-0330; [www.d-mpro.com](http://www.d-mpro.com); [info@d-mpro.com](mailto:info@d-mpro.com)

**Reverb/signal processing  
TC Electronic**

**System 6000 MKII:** With System 6000 MKII TC Electronic was able to import all algorithms, maintain the highest resolution, the lowest jitter, and bring entirely new features and tools to the creative process. Features include a network and Wi-Fi savvy platform, reads presets and includes algorithms from the original System 6000, ITU BS.1770, ATSC A/85 and EBU R128 compliant metering, Matrix 88 mixer and a stronger chassis.

818-665-4900; [www.tcelectronic.com](http://www.tcelectronic.com)  
[info@tcelectronic.com](mailto:info@tcelectronic.com)

**Find the mic  
winner  
October issue**

Congratulations to

**Keith Taylor**

of WSFR Louisville, KY.

His name was drawn from the correct entries for the October issue. He won Hosa HDC-800 headphones.



The mic icon was on the brick wall behind one of the host's chairs.

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

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

## NEW PRODUCTS

### Car audio player Livio Radio

**Carmen:** Carmen is a portable Internet radio player for use in a vehicle. Compatible with a Mac or PC, Carmen connects to the computer with a USB cable and, using the client software, records and stores content from more than 42,000 AM/FM and Internet-only radio stations streamed from around the world. Users may then connect it to a vehicle's 12V socket and play back the stored audio library through the car stereo using an open FM channel or auxiliary (AUX) input.

[www.livioradio.com/contact-us](http://www.livioradio.com/contact-us)

### Intra-corporate voice talent sharing vCreative

**vCreative Network Voice Pool:** This service allows radio station clusters to easily share intra-corporate voice talents within their entire company. Stations can assign and request voices from any of their sister stations across the country, no matter where they are located. The interface is easy to use, keeps all requests organized and out of e-mails and it gives each station vocal depth by offering a large variety of voice options. Outside voice pools can also be integrated into the system to add even more voice selections. Vcreative Network Voice Pool integrates into all Vcreative products and services.

800-605-9889; [www.vcreativeinc.com](http://www.vcreativeinc.com); [info@vcreativeinc.com](mailto:info@vcreativeinc.com)

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[www.pulse.com](http://www.pulse.com) 800.841.1005

### Digital telephone hybrids Telos Systems

**Hx1, Hx2:** The single-hybrid Hx1 and dual-hybrid Hx2 are packed with new features.

Symmetrical wide-range AGC and noise gate from Omnia automatically manages levels and EQ. Built-in auto-answer, caller disconnect detection, audio-leveling and anti-feedback routines for enhanced open-speaker applications, call screening and line-hold features, front-panel send, receive audio metering and an internal universal power supply are all standard on Hx hybrids. Other features include advanced POTS hybrid algorithms, digital dynamic EQ and adjustable smart leveler, separate EQ high and low display meters, high-contrast icon display of line status and front-panel hold button.

216-241-7225; [www.telos-systems.com](http://www.telos-systems.com); [telos-info@telos-systems.com](mailto:telos-info@telos-systems.com)

### Production music library TRF Production Music Library

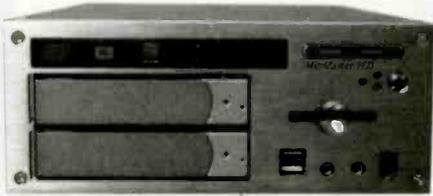
**Apollo Live:** TRF Production Music Libraries is releasing the first 26 Apollo Live CDs. More than 50 additional discs will be released during the next year. This new library offers contemporary, cutting edge high quality production music that is easy to use. These first discs include Ambient World Themes, Dance Trance, French Moods, Electro, Symphonic Hybrids, War, Medieval Fantasy, Extreme Sports, Eerie Drones, Surfer Rock, Electronic Crossover, Landscapes, Classical Electrascapes and Solo Piano.

800-899-MUSIC; [www.trfmusic.com](http://www.trfmusic.com); [trfemail@aol.com](mailto:trfemail@aol.com)

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Processing Technology Licensing Ltd.



**Encoding system  
Communitek  
Video Systems**

**Minicaster-HD:** Minicaster is a high-performance, stand-

alone encoding system designed specifically for live streaming of HD and SD content for Internet video broadcasts. Offering real-time MPEG4/H.264, Adobe Flash and Windows Media encoding, this compact device works for live broadcasts from both field and studio locations. Streams can be generated at bit rates ranging from 100kb/s to 1.5Mb/s in real-time from HD-SDI, SD-SDI, S-Video or composite video sources with either discrete or embedded audio. The Minicaster can also be equipped with up to 2TB of internal disk storage for simultaneous archiving of live streams during broadcasts. This self-contained unit is capable of operating on ac or dc power.

212-967-1774; [www.communitekvideo.com](http://www.communitekvideo.com)  
mini@communitekvideo.com



**Monitors  
ATC Loudspeaker Technology**

**SCM25A Pro:** These compact, rack-mountable monitors feature drive units with large-diameter, under-hung voice coils for dynamic range and linearity. The mid-range is ATCs soft dome and the bass driver is a hand-built, in-house, using a carbon-paper cone with high excursion capability. On-board amplification features the company's class A/B Mosfet output stage delivering 150W to the bass driver, 60W to the mid and 25W to the high frequency driver. All three stages are fed by fourth order critically damped crossover filters with phase compensation. The unit's ported enclosure measures 10.4" (H) x 16.9" (W) x 16" (D).

01285 760561; [www.atcloudspeakers.co.uk](http://www.atcloudspeakers.co.uk)  
info@atc.gb.net



**8-track portable recorder  
Tascam**

**DR-680:** The Tascam DR-680 brings multi-channel portable recording within reach of any musician for polished live, location and surround recordings. Up to eight tracks can be recorded to solid-state SD card media at 96kHz/24-bit broadcast WAV quality. Six mic inputs provide phantom power and 60dB of gain for great-sounding recordings with condenser microphones. Record the six microphones along with a digital S/PDIF source for 8-track recording.

Inputs can be monitored using a built-in mixer with level and pan controls for each input. The stereo mixdown can be recorded along with the six mics for quick stereo playback of the event. There's even a built-in speaker to check recordings without headphones.

323-726-0303; [www.tascam.com](http://www.tascam.com); [tascamlit@tascam.com](mailto:tascamlit@tascam.com)

**Dual LED controllers  
International Tower  
Lighting (ITL)**

**DLC-403:** The DLC-403 triple beacon Red/White LED controller utilizes ITL technology to control and monitor dual red/white LED lighting systems. The DLC-403 monitors and controls three dual red/white LED beacons and two levels of up to five LED side lights. Alarm contacts (Form-C) are provided for white beacon (3), red beacon (3), side light (2), power failure and photocell alarms. Status contacts (Form-C) are provided for day/night mode. Modular design allows for field replacement of fuses and control relays for repair.

615-256-6030; [www.itl-llc.com](http://www.itl-llc.com)  
info@itl-llc.com

**Audio amplifier  
RDL (Radio Design Labs)**

**FP-PA35A:** This amplifier is for applications where multiple 25V, 70V or 100V speakers in a zone need to be powered from a single source. It features a balanced line level input that may be connected unbalanced. A front panel gain control is designed to be adjusted manually. The gain range will accommodate standard unbalanced levels as well as professional balanced levels. Multiple distributed sound system speakers connect to the corresponding amplified output. The FP-PA35A includes an analog compressor/limiter. The input gain setting determines whether the limiter alone is used for clipping suppression, or if the full compressor/limiter will be used to substantially increase the average output power beyond that of a standard 35W amplifier.

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

### SD/USB recorder iKey-Audio

**RM3:** This 1RU digital media player/recorder

features a full-color LCD screen and a front-panel jog wheel for easy file search. It has many input/output options: Two 1/4" line inputs on the front to record any vocals or instruments, as well as a combo XLR/1/4" stereo jack and stereo RCA inputs on the rear. There are also front and rear mic inputs. It has two balanced XLR outputs and a stereo RCA output for pass-through ability. It has a 1/4" headphone/line output, which has its own dedicated volume adjustment on the front. An ac adapter, USB cable and 1GB SD memory card are included. It records directly onto SD cards up to 4GB, SDHC cards up to 32GB and any supported USB storage device of unlimited memory capacity. Files are recorded in MP3 formats up to 320kb/s or in WAV format with 44.1kHz/16-bit quality.

**732-346-0061; www.ikey-audio.com**  
**sales@gci-technologies.com**



### Load status indicator Trident Instruments

**LSI-55:** The Load Status Indicator (LSI) is a pilot light/indicator for applications never before considered. LSI will not only indicate when power is available, but also whether the load is active. This is done by constantly sensing the load current of the device being controlled.

**631-732-1378; www.lsi-55.com**  
**george@lsi-55.com**

### UPGRADES and UPDATES

**Tascam** has updated its DR-680 portable recorder to version 1.20, adding features for recording with mid-side microphones. (tascam.com)...  
The latest Windows driver set for **Lynx Studio Technology's** PCI and PCI-Express audio cards adds a new WaveRT driver and the ability to optimize performance based upon the Windows version being used. (www.lynxstudio.com)...  
**RadioTime** has released the BlackBerry version of its TuneIn Radio mobile application. (radiotime.com)...  
**Axia Audio** released a new version of iProbe, the software suite to remotely manage, update and maintain Axia IP-audio networks. (axiaaudio.com)...  
**Middle Atlantic Products** is now shipping RSH Series options for rackmounting a wide variety of iPod and other portable media player docks. (www.middleatlantic.com)

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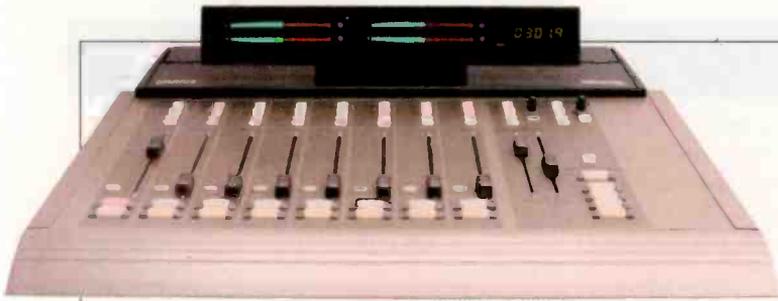
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Harris**

**PR&E Oasis:** A standalone on-air and production console, PR&E Oasis enables radio broadcast operations to convert to digital in their own timeframe. Designed for radio broadcast studios of any size and budget, Oasis is an 8- or 12-channel analog console that offers a clear digital migration path. Although built for the demands of digital studio operations, the design avoids reliance on PC engines and assemblies to ensure reliable and consistent on-air and production operations. Oasis incorporates both analog and digital outputs and provides multiple connections for microphones, CD players, monitors and a direct PC automation channel to support a diverse array of on-air sources. Key differentiators include two assignable telco channels to any fader, a modular design featuring swappable input cards, and USB playback and recording functionality, with playback available on any channel with any operating system.  
**800-622-0022; www.broadcast.harris.com; broadcast@harris.com**

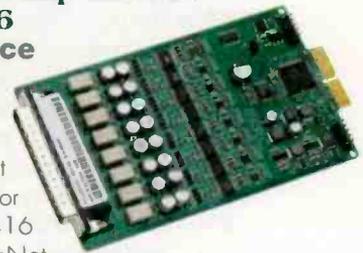
**Outdoor WiMax enclosure  
DDB Unlimited**

**OOD-54DX-GP-42:** Outdoor WiMax enclosures feature an Alumishield Top cover that shades the cabinet from the sun, stainless steel handles with NEMA washers and nylon locking nuts, centered and alodine-coated fully adjustable rails supported by three R-Struts, 1/2-gauge welded steel construction, and three-point locks/padlocking handles for front and rear doors.

**800-753-8459; www.ddbunlimited.com**

**Mic/line preamp module  
for ASI2416  
AudioScience**

**ASI1462:** The ASI1462 is an analog microphone/line input module intended for use in the ASI2416 Modular CobraNet



Interface. It contains eight microphone pre-amplifiers that operate at a 48kHz sample rate. Powerful floating point DSP processing in the ASI2416 provides each microphone preamp with a 5-band parametric equalizer and compressor/limiter.

**302-324-5333; www.audioscience.com  
sales@audioscience.com**

**Noise reduction plugin  
Waves Audio**

**W43:** Ambient noise like hiss, hum, traffic noise, wind and air conditioning can all wreak havoc on a dialogue track, but with the Waves W43 plugin, they're a thing of the past. The W43 delivers high-quality, minimal artifact multiband noise reduction, while adding all the advantages of software. W43 offers easy-to-use, four-band noise suppression controlled by four faders, a global threshold and an "engage" button. It supports multiple simultaneous instances and features true Pro Tools integration, full recall, zero latency, full automation, up to 24-bit, 192kHz resolution, and support for TDM, RTAS, Audio Suite, VST and AU. Also, no degradation of sound resulting from I/O conversion occurs.

**865-909-9200; www.waves.com  
info@waves.com**

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**Interconnect boxes  
Altinex**



**TNP141 and TNP141C:** Available in both standard and custom configurations, the TNP141/TNP141C interconnect boxes offer one-touch access for power and network access. A tabletop connection point for power and data, the TNP141 facilitates power and Internet/network access. Push down on the front of the top cover and the TNP141's latching mechanism releases, enabling the pneumatic spring to raise it into position. The TNP141C has more than 27 different connector options including USB, S-Video, RCA or BNC. Each connector comes with a 6' cable and is terminated appropriately for quick connections to an audio-visual system.

**800-ALTINEX; www.altinex.com  
solutions@altinex.com**

**DC protection system  
Optim Engineering**

**PWRguard:** Optim Engineering's PWRguard is an automatic safety switch inserted between a power source and the load. It switches off whenever the voltage is over 1.5V or under 11.5V, thus protecting the equipment being powered as well as the battery or power supply. If your power supply loses regulation and goes high, the PWRguard turns off, thereby protecting the equipment and the power supply. If the voltage drops down below 1.5V again, the PWRguard automatically turns back on. It will operate at up to 40 amps, and uses solid state FET switching. It protects a battery from over discharge by sensing the average voltage under load latching off for low battery, and then automatically switching back on if the battery is re-charged.

**203-299-0233; www.optimengineering.com; sales@optimengineering.com**



**Audio over-IP-encoder/decoder  
Barix**

**Exstreamer 500:** This audio-over-IP encoder/decoder features balanced inputs and outputs, contact closures (input and output) and a USB flash interface that allows use of external memory to store audio files. With reliable architecture, low power requirements and MP3/PCM/Ethersound support, the Exstreamer 500 is good for STL applications, professional audio endpoints (with IP or Ethersound protocol) and generic audio routing applications.

**866-815-0866; www.barix.com; info@barix.com**



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RFSPA	Pittsburgh	PA	Ed	866-412-7373
RFSPA	Philadelphia	PA	Phil	888-737-4452
RFSGA	Thomasville	GA	Chris	800-476-8943
RFSGA	Murray	KY	Dave	270-767-7644



**FM modulation monitor  
Deva Broadcast**

**DB3000:** The DB3000 FM modulation analyzer is a fully DSP-based digital FM demodulator and modulation analyzer. The RF (IF) and MPX signal is digitized as soon as it enters the device, and all signal processing is then made through calculations. This gives the equipment measurement reproducibility over time. Its processing power enables all measurements to be refreshed simultaneously and synchronously, allowing detailed readings of all the multiplex FM signal components. Read main signal parameters at a glance with high-resolution bar graph displays. A built-in oscilloscope representing the observed signal change over time enables you to visualize the most important signals participating in the process of demodulating and stereo decoding. Spectrum analysis is available on the input signal and MPX power measurement supports measurement data history.

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

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MODEL 340

MX12LW



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

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MODEL 343

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**Monitoring speakers  
Focal Professional**



**CMS 40:** The CMS 40 combines sound neutrality, extended bass frequency, high dynamics and absence of distortion at high sound levels, in an ultra-compact speaker. Its design allows near-field listening from as little as 16" without compromising sound neutrality or the delicate mid-bass and bass balance. Its compact size, combined with mounting points at the back and under the monitor, makes it easy to install even in the smallest post-production rooms. The CMS 40 monitor is equipped with an aluminum/magnesium inverted dome tweeter. The cabinet design combines an aluminum case with specific acoustic treatment. The 25W RMS, class AB, bi-amped system features adjustments for high- and low-frequency shelving.

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



**Audio analyzers  
Rohde & Schwarz**

**UPP200/400/800:** With this audio analyzer (depending on the model), two, four or eight channels are processed in parallel; and by cascading multiple instruments, users can simultaneously trigger up to 48 measurement channels, which cuts down on measurement time. Designed for system applications, it features low height, and comes without front-panel control elements or integrated display. The instrument can be remote controlled via LAN, USB or IEC/IEEE bus. In combination with an external monitor, mouse and keyboard, it becomes a manually operable measuring instrument for a lab bench. It has an integrated control PC, and the required software is already installed.

410-910-7800; [www.rohde-schwarz.com](http://www.rohde-schwarz.com)  
info@rsa.rohde-schwarz.com

**Surface mount toggle and pushbutton switches  
NKK Switches**

**G3T, G3B Series:** The G3T Series and G3B Series of ultra-miniature, process sealed, surface mount toggle and pushbutton switches are for handheld equipment as well as high-density mounting. Both series' feature NKK's award winning STC (Sliding Twin Crossbar) contact mechanism. This innovative design guarantees unparalleled logic level switching reliability. The contacts are gold plated and wiped clean with every actuation, providing a smoother, positive detent actuation and increased contact stability. The bushing and housing are constructed of one molded piece and a rubber o-ring surrounds the actuator. In addition, a rubber seal surrounds the base where it fits into the actuator. The terminals are epoxy sealed and molded in to lock out flux, solvents and other contaminants.

480-991-0942; [www.nkkswitches.com](http://www.nkkswitches.com); sales@nkkswitches.com

**Smartphone mic  
VeriCorder Technology**

**Mini Mic:** Turn an iPod Touch into a Skype phone. Insert a mic, make a call and when the call connects press speaker. This compact microphone is designed to transform the latest smartphones and MP3 players into a portable sound recorder. It provides improved sound quality and range and will work with any smartphone MP3 player having a 3.5mm, four-pin jack, such as the iPhone, iPod Touch 2G, Blackberry or Nokia. Use with VC Audio Pro or ShowCase recording and editing software for iPhone to create audio projects. To eliminate outside sounds, put an iPhone in airplane mode when recording.

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Sentinel 4 is an Ethernet-based data acquisition device with four optically-isolated status (logic) inputs and four programmable SPDT relays. Each status input and all relays can be controlled and/or monitored over any IP network including private networks, IP-based industrial control network and the Internet. Users can operate the product using a Web browser or Web-enabled mobile device, while e-mail notification may be configured to alert up to four recipients when alarms are detected. The user may also enable a sound effect to play on the monitoring PC when an alarm is generated. SNMP capabilities also allow multiple units to be monitored with any SNMP manager software package.

877-250-5575; [www.broadcasttools.com](http://www.broadcasttools.com)  
[bti@broadcasttools.com](mailto:bti@broadcasttools.com)

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**PalmTrack:** Record stereo or four-capsule omni audio directly to an SD card with the pocket-sized PalmTrack. Just insert the included batteries and SD card and press record. Monitor while recording with headphones and watch the real-time level meters, or just switch on auto mic gain. Check out recordings on the PalmTrack's built-in speaker, using headphones, connecting the PalmTrack to a Mac or PC with its mini USB jack, or by removing the SD card and inserting it into a computer's SD card slot or reader. Choose between 44.1 and 48kHz sample rates, select an MP3 bit rate from 64 to 320kb/s for maximum recording time, or choose uncompressed 16 or 24-bit WAV for broadcast-quality recording.

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For Analog and Digital Broadcasting



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

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**8dB FM IBOC hybrid injector  
ERI-Electronics Research**



**CD324-8DB:** The CD324-8DB is intended for use by FM radio facilities increasing IBOC injection to -1.4dB (4 percent). Its design is based on the field-proven 10dB FM IBOC hybrid combiner used extensively in early IBOC FM field trials. By reducing the coupling level to 8dB the amount of digital power lost to the system reject load is reduced, while the analog power loss increases slightly. The 8dB Injector Hybrid is intended for those FM facilities running at low transmitter power levels and have an interest in increasing their IBOC effective radiate power level to the recently authorized -1.4dB power level.

812-925-6000; [www.ERInc.com](http://www.ERInc.com); [sales@ERInc.com](mailto:sales@ERInc.com)

**Nearfield monitors  
Blue Sky International**

**EXO2:** The next generation of EXO combines true, full-range monitoring with the convenience of a desktop remote control hub, but with a twist. EXO2's revamped subwoofer features an even smaller footprint. Features include two 3" two-way satellites with 1" soft-dome tweeter, separate 8" subwoofer, 160W total system power, XLR/TRS inputs, RCA inputs and a 3.5mm mini jack for iPods and MP3 players.



516-249-1399; [www.abluesky.com](http://www.abluesky.com); [info@abluesky.com](mailto:info@abluesky.com)

**Satellite radio images on TV  
Radio Netherlands Worldwide**

**Radio with Pictures:** WRN has launched Radio with Pictures, which allows satellite and cable radio stations to display visual content on TV screens. Visuals could include live graphics, existing Web content or interactive SMS and Twitter feeds. Radio stations appear alongside television stations on the electronic program guide and not via a separate radio menu, widening the potential audience. Web content can be repurposed so that it is used to reach vast TV audiences that may have no Internet access or where access may be locally restricted. Listeners' SMS messages and Twitter tweets can be displayed on the screen increasing audience interactivity. Live visuals from the studio can accompany radio programming or content can be uploaded in advance. Bandwidth requirement is lower than for conventional graphic transmission.

[www.rnw.nl/english](http://www.rnw.nl/english)

**Studio monitors  
Adam Professional Audio**

**AX Series:** All models of the new AX-Series now feature improvements found in Adam's top line monitors. The changes made to the A5X and the A7X are a fundamental revision of the A-Series. The X-ART tweeter, now replaces the ART tweeter in the new AX versions. The X-ART tweeter features a higher efficiency and maximum sound pressure level as well as a frequency response up to 50kHz. All woofers and amplifiers have also been reengineered from scratch, featuring larger voice-coils and amps with twice the power for higher linear excursions and more output. The cabinets have been redesigned, all models sport two bass reflex parts. The A3X is now Adam's smallest monitor ever, and the larger A8X opens the door to midfield monitoring and is the top of the AX line.

818-991-3800; [www.adam-audio.com](http://www.adam-audio.com); [usa@adam-audio.com](mailto:usa@adam-audio.com)



**Cardioid condenser mic  
Mojae Audio**

**MA-101fet:** The new MA-101 fet provides warm, full-bodied reproductions of instruments. The microphone's warm FET circuitry and externally polarized capacitor combine to deliver low noise and high-quality performance. The MA-101 fet features both omni and cardioid polar patterns by way of interchangeable capsules and with its 3-micron-thick, 0.8" diameter gold sputtered diaphragm, this new microphone is a truly versatile recording instrument. It features a frequency response of 20Hz-20kHz ±3dB, a sensitivity rating of -40dB (1V per pascal), with a distortion rating of less than 1 percent at 120dB SPL (-1.5dB pad off) and less than 1 percent at 135dB SPL (-1.5dB pad on). The microphone operates on standard 48 V Phantom power.

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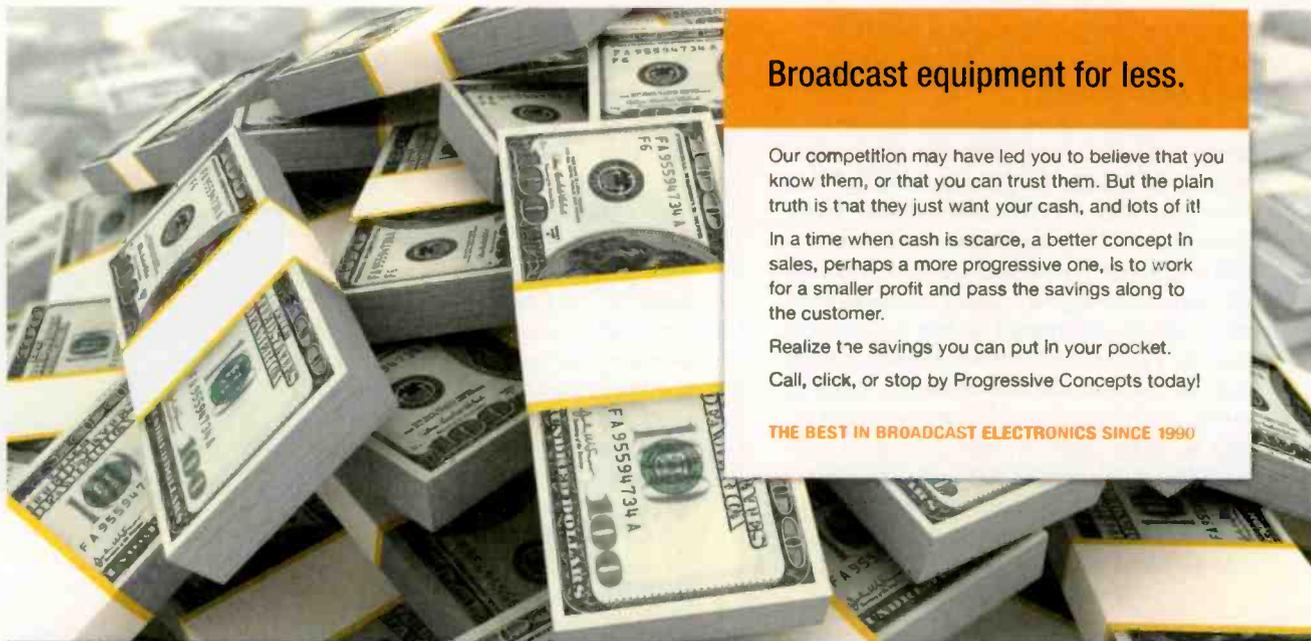
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**Sync technology  
Steinberg**



**Nuendo Syncstation:** Nuendo Syncstation is a solidly built 19" rack mount unit houses technology that offers sample-accurate sync with video tape recorders, analog tape machines, other DAWs and house sync generators. It supports a long list of standards and protocols, including MTC, LTC, MMC, Sony 9-pin RS-422, word clock, VITC, Tri-level and black burst and varispeed operation over a huge array of pull-up/pull-down settings, as well as sample-accurate VST System Link over digital connections such as AES/EBU and S/PDIF. Uniquely, Nuendo SyncStation can offer extremely accurate sync using traditionally less accurate standards like MTC by referencing with sample-accuracy to each video frame.

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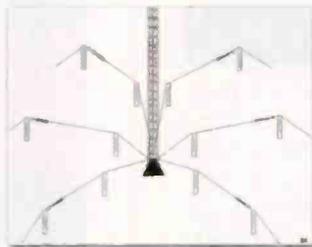
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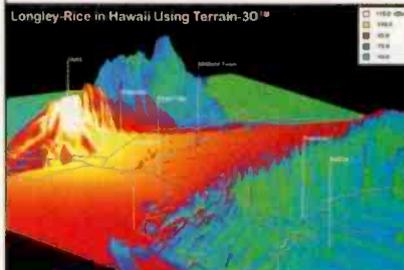
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# Contributor Pro-file

Meet the professionals who write for *Radio* magazine.

This month: Field Report, page 40.



**Mike Kernen**  
Chief Engineer  
Greater Media  
Detroit

Kernen's start in radio was building recording studio in his parents' basement from old WXYZ-AM studio parts. He also

spent time on weekends screening phone calls for his uncle Dick Kernen's radio talk show. After starting as an electrician's helper, his uncle urged him to attend the Specs Howard School of Media Arts where his uncle happens to be vice president.

His professional radio career includes work at WJR/WHYT, Ron Rose Productions in Southfield, and then WRIF in January 1988.



Written by radio professionals  
Written for radio professionals

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by Erin Shipps, associate editor

## Do you remember?



FDR with Western Electric Model 618-A mics

As if we didn't give you enough classic microphone pics in our Trends in Technology feature this month, here are some more from Electro-Voice we stumbled upon that weren't mentioned in the article. All mics are owned by Ron Petersen Sr., owner of KMXL-FM/KDMO-AM, Carthage, MO. More information on these mics is at [RadioMagOnline.com](http://RadioMagOnline.com). Also, thanks to our sister publication, *Mix* magazine, we've got this great shot of FDR using the Western Electric Model 618-A. Do you have a favorite vintage broadcast mic we didn't mention? Send us your photos and comment on this article at [RadioMagOnline.com](http://RadioMagOnline.com).

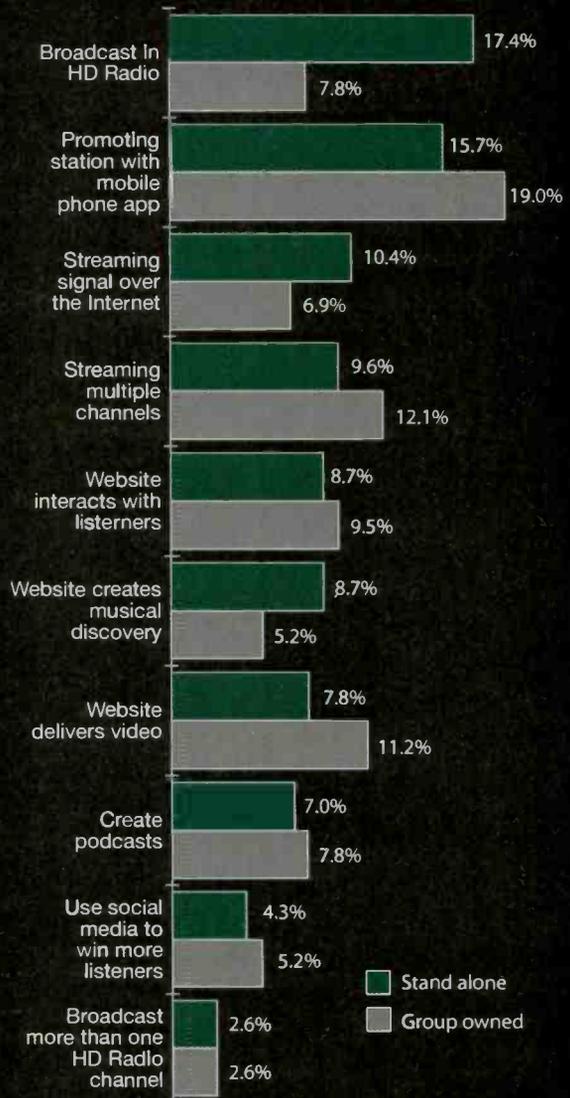


Clockwise from top left: Electro-Voice Model V3, Model 623, Model 664, and Model 654.

## Sample and Hold Revenue generation

Wheatstone recently sponsored a progress report entitled "Revenue Generating Radio Technologies," which surveyed radio industry technical managers. One interesting tidbit from the report was that revenue generating technology that most group-owned stations plan on deploying next is a mobile app, while for stand-alone stations, it is broadcasting in HD Radio, with mobile apps coming in a close second. At any rate, radio stations are definitely branching out when it comes to content delivery.

Which of the following that you are not now doing, do you plan to do next?



Source: Althea Research

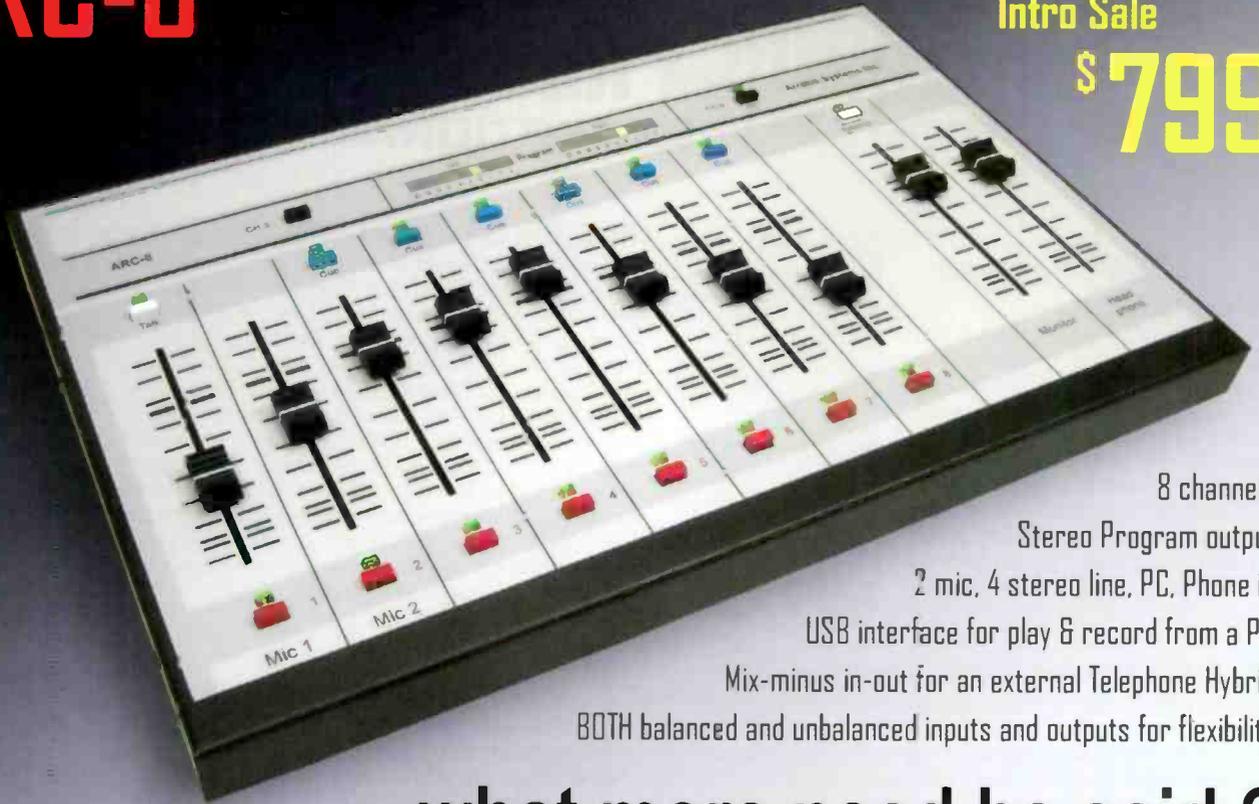
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### AirAura 31-Band Fine Grain Processing

*The Beatles, The Rolling Stones, The Who, The Beach Boys, Jimi Hendrix, Metallica, Pearl Jam, Nirvana, Bruce Springsteen & The E-Street Band, Led Zeppelin, Van Halen, Queen, The Eagles, U2, Rush, Genesis, Steely Dan, The Allman Brothers, ZZ Top, Cream, Dire Straits, The Grateful Dead, Red Hot Chili Peppers, Talking Heads, The Clash, Tool, Korn, Alice In Chains, Little Feat, Spinal Tap, R.E.M.* That's 31 bands who will sound better on the air with our 31-Band Fine Grain Processing. But the truth is EVERY band will sound better. And solo acts, too. AirAura's final limiters perform precision spectral energy control without generating the artifacts you're used to trying to squash with your old processors. Bottom line, your music sounds like music rather than a bad cell phone call (YOU know what we're talking about...)



### AirAura Sweet-Spot Technology

When you think about the 'sweet-spot' you need to think about this: Every song or album (yes, a CD IS an album) is mastered differently. Record companies are having their own loudness wars. Of course, this can play havoc with your on-air processor, which essentially is 'mastering' the signal you broadcast. Sweet Spot Technology (SST) has been uniquely designed by Vorsis to manage the behavior of the multi-band AGC as program content density changes, something a typical broadband AGC simply cannot do. It effortlessly handles transitions between the hyper-compressed recordings of today and those of the past that have considerably more dynamic range. SST achieves uncannily natural-sounding consistency in both on-air loudness and spectral balance regardless of density variations in the incoming source material.



### Vorsis Bass Management System - v2.0

Want to make a good, impactful impression? Nothing does that better than perfectly tight bass that isn't walking all over your music. Or should we say swishing through. From the sound of things, the other guys got bass (rhymes with ace) confused with bass (rhymes with donkey). We take care of that - VBMS enhances bass impact without affecting the clarity of mid and high frequency program. In fact, bass detail and the clarity of higher frequency audio are actually enhanced by this powerful, innovative algorithm. With VBMS operating in conjunction with our 'Fine Grain' limiters, on-air bass has never sounded so good and so natural.



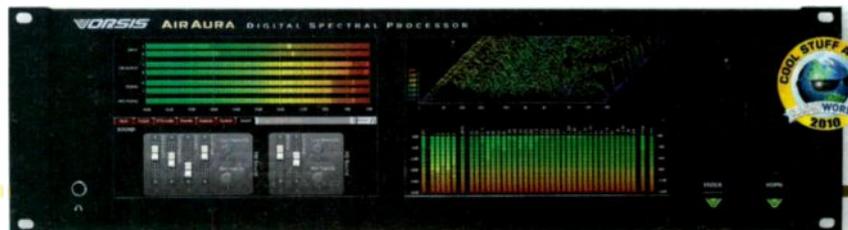
### Vorsis Smart Stereo Enhancement

Sure your email box is overflowing with offers of enhancement. But how many are offering Smart Stereo Enhancement? Hmm? With THIS kind of enhancement, your music sounds more natural than ever. It provides a smooth, natural, wide listening experience without triggering multipath effects, delivering an extremely stable 'on-air' stereo image that's exciting to listen to. This, alone, is responsible for a lot of people going back to their drawing boards.



## AIRAURA SUPER DIGITAL AUDIO SPECTRAL PROCESSOR

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