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Red River Radio
Inside the new studio project

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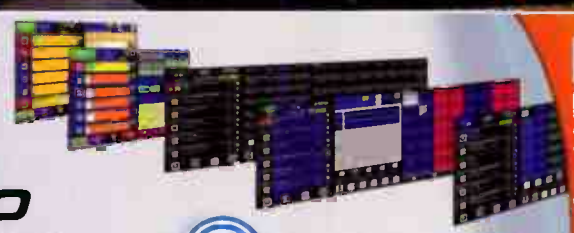

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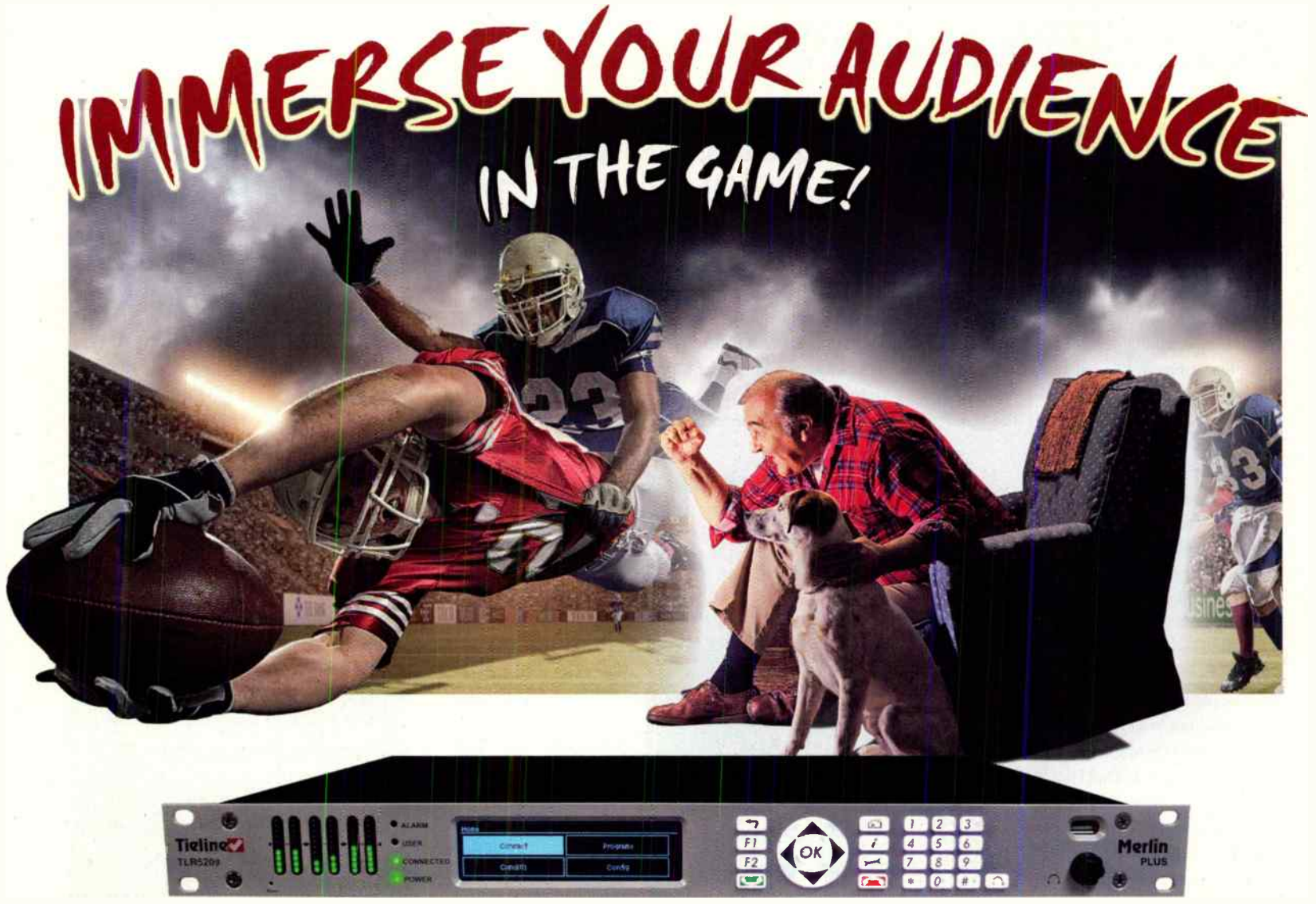

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Cumulus Acquires Dial Global, Sells and Swaps Stations with Townsquare Media

Cumulus Media Inc. has been active with sales and acquisitions. The broadcasters has acquired Dial Global for $260 million in cash (consisting of approximately $45 million attributable to equity and the retirement of $215 million of debt), sold 53 radio stations in 12 small and mid-sized markets to Townsquare Media for $238 million in cash (inclusive of the acquisition of net working capital), and swapped 15 radio stations in two small and mid-sized markets in exchange for the receipt of five stations in Fresno, CA, with Townsquare Media.

"These transactions give us the necessary scale to provide the marketing and enterprise solutions our advertising and affiliate partners require," said Lew Dickey, CEO of Cumulus. "Our goal is to be the leading producer of premium audio content distributed through multiple platforms while continuing to build our broadcast platform in the top 100 U.S. markets."

The acquisition of Dial Global will add sports, news, talk, music and programming services content - enabling Cumulus to provide a wider variety of options to approximately 10,000 U.S. radio stations, other media platforms and international platforms. New content acquired through the Dial Global acquisition will include NFL, NCAA, NASCAR, Olympics, AP Radio News, NBC News and other popular programming.

WestwoodOne

Dial Global Changes Name to WestwoodOne

The name change announcement came shortly after Cumulus announced it was buying the programming distributor.

The Westwood One name was launched in 1971. Through various ownership changes, the company merged with Triton Media Group, which folded Westwood One into its Dial Global subsidiary. In 2012, the brand name was dropped.

$6.9M

Broadcasters donated $6.9 Million in airtime for the NAB's OK2TALK campaign. PSAs for mental health awareness have aired on radio stations more than 3,300 times.

Sprint added NextRadio app to FM-enabled smartphones. Data for the app is supplied by TagStation.

Orban hired Dennis van Benthem as sales and technical support engineer and Tobias Winter as Orban technician. The new employees will work from offices in Amsterdam and Ludwigsberg, Germany, respectively.

Lawo North America has appointed two new personnel: Don Bird, VP business development and marketing, and Damian Fink, product support manager. Both will work closely to provide sales and product support.

Snelson Elected President of SBE

The membership of the Society of Broadcast Engineers has elected Joseph Snelson, CPBE 8-VSB, as its next president. Snelson, who is vice president of engineering at Meredith Corp., will begin his one-year term on Oct. 30, 2013. Snelson currently serves as the SBE vice president, chairs the SBE Frequency Coordination Committee and serves on the society's certification and government relations committees. Snelson resides in Las Vegas, and is a member of the Las Vegas SBE chapter. *Fiind out who else was elected at RadioMagOnline.com.*

Harris Broadcast Strengthens Leadership

Harris Broadcast will preview its new management team's vision and strategy at IBC 2013 in Amsterdam. The business also announced new senior management appointments. Steve Foreman has been named president of global operations and services, and Jeff Liening, senior vice president of global sales operations.

Burk Technology adds Matt Leland as Director of Sales, Tom Ray as Sales Rep

Burk Technology has added Matt Leland and Tom Ray, CPBE DRB AMD, to its sales team. Leland has more than 30 years of experience in broadcast manufacturing and technical sales and product design. As a broadcast industry veteran, he has extensive experience working with broadcasters to provide engineered solutions for their transmitter site challenges.

Ray is former director of engineering of Buckley Broadcasting and WOR Radio in New York City. During his 15-year tenure with WOR, he rebuilt the entire facility from microphones to towers. He made WOR the first high-power AM HD Radio station in the world.

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 3-pack of Hosa HMIC-025 mic cables . Send your entry to radio@RadioMagOnline.com by Oct. 10. Be sure to include your guess, name, job title, company name, mailing address and phone number. No purchase necessary. For complete rules, go to RadioMagOnline.com

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VIEWPOINT

Fall Means Conventions

September marks the annual Radio Show, jointly produced by the NAB and the RAB. As you know by now, the convention will be held in Orlando this year. The Radio Show has made the rounds around country, which provides some people with a better opportunity to attend when the convention goes to a specific region.

Some people view the Radio Show (and its predecessor, the NAB Radio Show) as a convention only for programmers, sales people or owners. It's obvious these areas are covered in the sessions, but there is an engineering and technical element as well. We have a rundown of the technical programming in this issue on page 32. But if you're an engineer, don't limit yourself to only attending the technical sessions. Rub elbows with the programmers, sales people and owners and get a feel for what's important to them. It may not be your primary interest, but it's all part of station operations. Chances are good you'll learn something that will increase your value to the station management team.

But there's more happening in the fall than just the Radio Show. The Audio Engineering Society has its fall convention as well. This year it's back to New York City. There's a Broadcast and Streaming conference at the AES convention that addresses several recurring topics and some new items of interest as well. The 135th AES runs from Oct. 17 - 20.

Other events taking place this fall:

> The SBE22 Broadcast and Technology Expo was held Sept. 25 in Verona, NY. This annual conference continues to grow every year.

> The Wisconsin Broadcast Clinic, presented by the Wisconsin Broadcasters Association and the state's SBE chapters, runs from Oct. 8 - 10 in Madison, WI. This annual event attracts lots of great presentations.

> The Ohio Association of Broadcasters holds an annual Engineering Conference in Columbus, OH. The 2013 event will be held on Nov. 7.

> The Society of Broadcast Engineers holds an annual meeting at locations with other convention partners. This year, the SBE meeting will be held in Indianapolis with the Indiana Broadcasters Association Oct. 29 - 30.

And there is one event now behind us:

> The Texas Association of Broadcasters holds its convention in August. The next one will be held Aug. 6 - 7, 2014, in Austin.

I have only touched the surface of regional events being held in the summer and fall. I know there are more. (We have a list of industry events at RadioMagOnline.com/calendar as well.) In the spring, I often hear that it's not practical to trek all the way to Las Vegas for nearly a week of sessions and exhibits. But you have a good chance of finding a regional event that can provide an outstanding educational and networking experience. Some may be just a day trip. Others might require an overnight stay. Regardless, think ahead now and plan to attend one soon. Put it in the budget so it's not a last-minute surprise request.

And one more reminder: We're gathering information for our Annual Salary Survey right now. Follow the link at RadioMagOnline.com today.

Chriss Scherer | Editor

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The Vertical Radiator: How It Works

by Jeremy Ruck, PE

At the heart of the transmission of every radio signal is the antenna, and the simplest construct is the dipole. So basic is the dipole antenna that the half-wave version is in nearly all circumstances used as the reference point for other antennas. In those instances where the dipole is not used as the reference, its cousin the theoretical isotropic radiator is used instead.

The vertical radiator, as its name implies, is a metallic mass, usually a tower in the broadcasting world, beginning at an elevation close to ground level and extending vertically to some height. This element is excited in certain fashions, with the series and the shunt topologies being the most common. If the half-wave dipole is the standard by which most other antennae are compared, then the reference point for vertical antennas is the quarter-wave vertical.

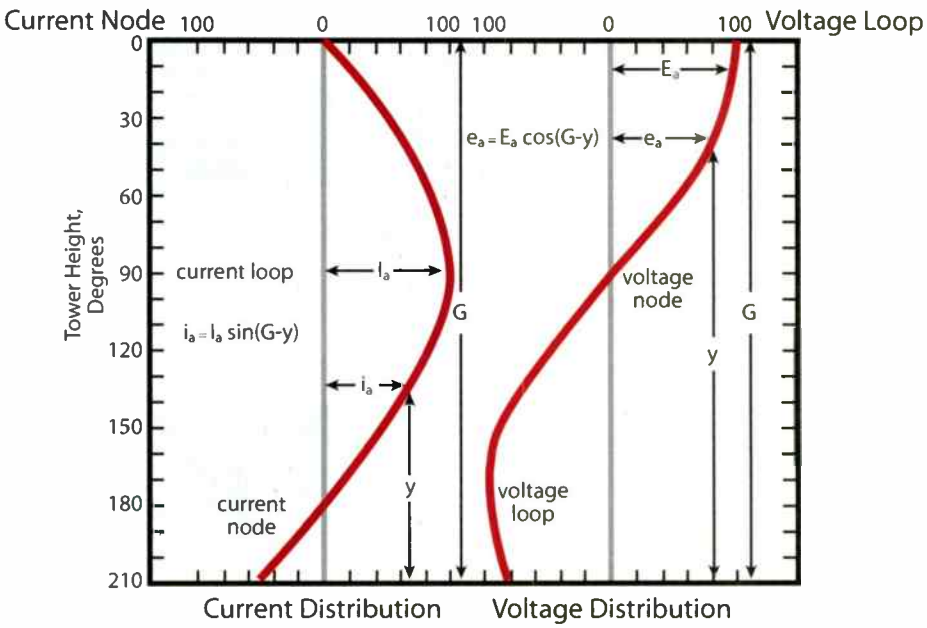
Frequency multiplied by wavelength is equivalent to the velocity of light, which results in an inversely proportional relationship between the two quantities. Thus, when either frequency or wavelength is increased, the other must decrease so that the product of the two remains equivalent to the speed of light. Therefore, wavelength will vary depending on dial location.

THINKING BIG

At FM, a quarter-wavelength varies by about six inches across the 20MHz span of the band. In the AM band, however, a quarter-wavelength ranges from a little less than 145' at 1700kHz up to a whopping 464' at 530kHz. So theoretically speaking, your 464' of steel on 530kHz will perform identically to the guys down the road on 1700kHz with only 145' of tower. Two such facilities for a given power level will, of course, have vastly different footprints, but those variances have to do with other factors, which we will discuss at a later date.

You may hear your consulting engineer refer to tower heights and spacings in terms of degrees. Indeed closer examination of Commission-issued licenses and construction permits also use that notation. Remember that a radio wave propagating is a sine wave, which is a repetitive oscillation, and can be thought of as a circle. Rotating through 360 degrees on a circle will bring you back to start. So a quarter-wavelength is one-fourth of a circle or 90 degrees, a half-wavelength 180 degrees, and so forth.

The distribution of current in a vertical radiator generally follows a sine wave, or sinusoidal, distribution. For theoretical vertical antennas, the maximum current point falls 90 degrees below the top of the tower, while in practice it will not occur that far down due to the velocity of propagation, which increases with tower cross-section. The voltage in the tower tends to follow a cosine distribution, which is in essence a sine wave shifted by 90 degrees. Thus, the maximum current location corresponds to the minimum voltage location. This variation in current distribution allows for steering of the radiation in a vertical plane, and is one of the techniques used to achieve allocation compliance with DA designs.



Source: NAB Engineering Handbook

Figure 1. Theoretical current and voltage distribution on a vertical radiator.

KEEP CURRENT

The current in the antenna is of course a very important quantity to us as broadcast engineers. For the non-directional station the product of the base current squared and the resistance component of the tower impedance yields the antenna input power. This is the genesis of the I^2R term that is bantered about, and comes from an application of Ohm's Law nestled within an

World Radio History

application of Joule's first law. Joule's first law says power is voltage times current, and by Ohm's Law voltage is current times resistance, thus power is current multiplied by itself with that product multiplied by the resistance.

Pondering this a little deeper, it should be clear that if the voltage and current in the tower varies by height, and resistance, or more correctly impedance, is the quotient of the voltage and current in the antenna, then the impedance of the tower will vary by height as well. Indeed this is the case, and every radiator will have its own characteristic impedance. Theoretically speaking, a generic quarter-wave tower will have a base resistance of around 37Ω and zero reactance, assuming a perfectly conducting ground system. In reality, however, the ground system does not conduct perfectly, which combined with other localized factors, skews the impedance from this value in practice. As the radiator height varies from this point, the impedance will of course fluctuate. Shorter towers will tend to result in lower impedance values, while the converse will of course be true for taller elements.

Although the impedance of the tower may vary somewhat between its inactive and active states, much larger changes will occur when the radiator is an element in a directional array. When an array is active, the elements mutually couple based on the current ratios and phase shifts in the elements combined with the array geometry, yielding a set of drive point impedances. In some arrays the geometry and ratios create conditions where the impedance of one or more of the towers is negative in magnitude. Many engineers tend to have a visceral reaction to a "negative tower", and may even contemplate acquiring garlic to be part of their wardrobe, or carrying silver ammunition. The negative tower simply delivers power back into the phasor rather than having power delivered to it from the phasor, and is a somewhat common occurrence. Instability in arrays with negative towers, usually the cause of disparaging comments, tends to more often than not be a function of the proximity of the impedance to zero ohms rather than the sign of the impedance.

Either way, the impedance of the radiator will never fall nicely on the characteristic value of the line or the design value for the transmitter. This is where the antenna tuning unit (ATU) or antenna coupling unit (ACU), your preference, comes into play. This device is a network of passive components that transforms the impedance of the transmission line to the impedance of the tower with a particular phase shift. The components used to create these networks are capacitors and inductors, as their theoretical power dissipation is zero watts.

An increase in the height of the element will also tend to increase the efficiency of the radiator, but only up to a certain point. The efficiency of the radiator is the unattenuated field strength that it will generate at some distance. Historically the mile was used as that distance, but currently the Commission uses the kilometer as that standard. Up to around 190 degrees or so in height (0.53 wavelength), the field strength from the antenna will increase. Above this point, the field strength at ground level will continue to increase at a lower rate, and a high angle lobe at 60 to 70 degrees above horizontal crops up. Above about 5/8 wavelength or 225 degrees, the high angle lobe increases at a greater rate, and the radiated field strength at low angles, which is necessary for local coverage, drops off rapidly. That pesky sine wave pops up yet again.

The vertical radiator is most definitely a time-tested concept that has served us as broadcasters extremely well over the years. Even in these days of ubiquitous computing power and information accessibility, there is still a certain mystique associated with them. I guess ultimately that is a good thing as it continues, at least in some small way, the promotion of the romanticism that is radio.

Ruck is the principal engineer of Jeremy Ruck and Associates, Canton, IL.

World Radio History

Reconciliation of AM Tower Protection Rules

by Lee Petro

Towers for AM stations are unique. Rather than merely serving as the structure on which a broadcast antenna is placed, an AM tower is the antenna. This fact, coupled with AM propagation characteristics that can "light up" nearby structures, has led to efforts by the FCC to provide protection to AM towers from newly constructed facilities.

Despite the problem, the FCC has had a hodge-podge of AM tower protection rules that did not apply to all FCC-regulated services. For example, newly constructed facilities for Private Land Mobile Radio and Personal Communication services have not been required to provide protection to existing AM towers, while towers for other wireless communications services, including the Public Mobile Service, do have to provide protection. Furthermore, problems arise when a tower is constructed for a service that does not require protection, but then licensees that would otherwise have to protect existing AM towers are added.

In an effort to establish one set of rules that takes into account the need for protecting existing AM towers, and also provide clarity to the industry, the FCC adopted rules in August 2013. The new rules will apply to all telecommunications services regulated by the FCC, and establishes procedures for notification to AM tower owners prior to the commencement of nearby construction. The rules also establish procedures to determine whether the newly constructed facility is the cause of distortion to the AM signal, and exempts short towers from having to comply with the new rules.

Specifically, the new rules establish a zone of protection based on the electrical height of the AM tower and the proposed facility. The impact of a new construction is based solely on the new tower's proximity, so it also must take into account the frequency for the AM station.

Therefore, the protected area for non-directional AM stations was determined to be one wavelength at the frequency of the AM station, where as the protected area for directional AM stations is "any distance less than 10 wavelengths of the frequency of the AM station, up to a maximum distance of 3km." All proposed new towers, or modifications to existing towers (that would alter the antenna height relative to the AM tower of five electrical degrees or more) or removing or modifying an existing tower or transmission line (on a detuned or base-insulated nearby tower), falls within the new rules.

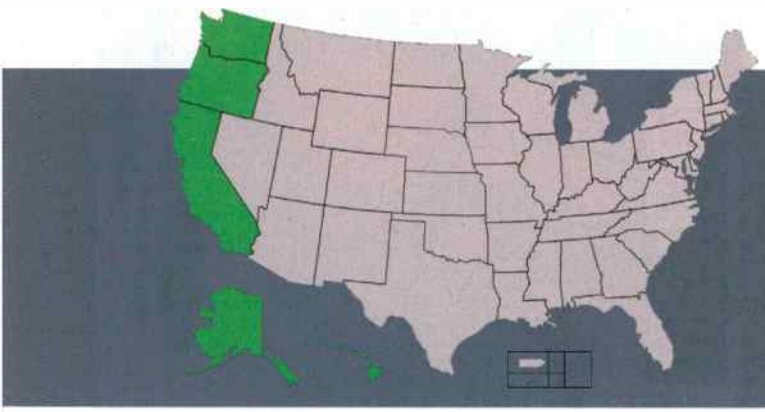
In such cases, the party proposing a new or modified tower must notify the licensee at least 30 days in advance before constructing or modifying the tower. The proponent must also consider the impact of the proposed change by using the "moment method" predictive analysis. This method replaced the vintage AM practice of preparing lengthy proofs of performance studies, and instead uses computer analysis to determine the status of an AM signal.

If the new or modified construction would show in impact of 2dB to non-directional AM station patterns, or cause a directional AM pattern to exceed its authorized pattern, then the proponent must take the necessary steps post-construction, including detuning or other measures, to eliminate the impact of its construction. In addition, the AM licensee is provided two years after the construction/modification of the, other tower to supply an adverse impact showing. For recently completed constructions and modifications (i.e., before the new rules came into effect), the AM licensee will have one year to determine whether the other tower is impermissibly affecting its pattern.

Exceptions: 1. Towers that do not meet the electrical height standards discussed above are not required to notify the tower owner. 2. If a tower will be located on a building, the FCC requires consideration only of the height of the tower, not the building on which it will be installed.

The new rules will be effective after they are published in the Federal Register. In the meantime, AM licensees may consider reviewing their current patterns as a baseline against future nearby construction projects.

Petro is of counsel at Drinker Biddle & Reath, LLP. Email: lee.petro@dbr.com.



DATELINE

September: Stations in California continue running License Renewal Post-Filing Announcements on Sept. 16. Stations in Alaska, American Samoa, Guam, Hawaii, Mariana Islands, Oregon, Saipan, and Washington continue running License Renewal Pre-Filing Announcements on Sept. 16. Commercial Broadcast Stations file Annual Regulatory Fees on Sept. 20. Don't forget your Broadcast Auxiliary licenses.

October: Stations in Alaska, American Samoa, Guam, Hawaii, Mariana Islands, Oregon, Saipan, and Washington file License Renewal Application and EEO Program Report, and Noncommercial stations file Ownership Report (323-E) on Oct. 1. Commence running License Renewal Post-Filing Announcements, continuing on Oct. 16, and Nov. 1 and 16.

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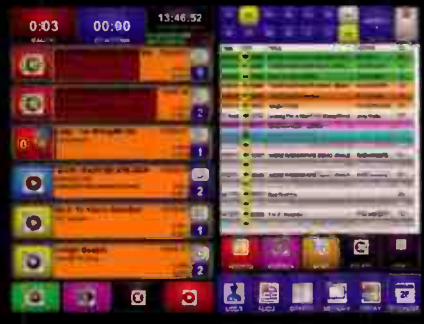

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The Digital Toolbox

Useful tools to aid in installing and maintaining Ethernet networks

By Doug Irwin, CPBE DRB AMD

If you are working as a one-man-band engineering department, then it makes sense to provide yourself with the tools that increase productivity (read: make your job easier). Few things are more useful these days than tools that make installing and maintaining Ethernet easier and faster. To that end, I have assembled some tools and ideas to facilitate that process.

I hate walking back and forth between two ends of an Ethernet cable run that is pulled through the ceiling and wall only to find that one end has a problem. (Which end is it!?) The simple way to get around this is to just pick up a cable tester with a terminating device. Just one example (and there are many) is the Tripp Lite (Model N0-44) Network cable tester. To test the cable run, plug the remote device

Tripp Lite N044-000-R

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Hobbes LANsmart

into the jack to be tested with a cable (it doesn't plug directly into the jack.) Then test the cable run (and all intermediate connections) for shorts, opens and miswiring. This device is really made for office/cubical installers, so it has provisions to test RJ-12, BNC and type F connectors as well.

Perhaps you have a bit more money to spend on this particular tool; if so you might consider something like the Hobbes (model 256003) LANsmart. With this device you can not only check cable wiring (shorts, opens, miswiring, reversals) but you can also use LANsmart's built-in time domain reflectometer to check the cable length and for the distance back to any opens or shorts in a cable. Another neat feature this one has is its ability to send audio signals on selected pins on the cable — useful for tracking down mystery cables.

More and more Ethernet-powered devices are showing up around the radio station and the transmitter site — including VoIP phones, wireless access points, IP cameras, and the like. The ability to test the current-handling capability of Ethernet wiring has become crucial, and for that reason the Psiber Lanmaster 35 is a tool that you may want to consider having in-house. This device conducts power tests over the Ethernet wiring and verifies its ability to pass current from the far end power source. It measures the loop resistance so that you can identify damaged cables and bad punches. It also happens to provide link speed and duplex modes as well as cable length.

Psiber Lanmaster 35

BEYOND THE CONNECTOR

Of course we don't want to limit the topic to just Cat-5/6 cables with RJ-45s on them. Wi-fi access points are commonly used around radio stations as well. Clearly there are devices and software out there made for Wi-fi analysis. Let's take a look at a well-known one: inSSIDer (office version) from MetaGeek. This is an inexpensive hardware and software package that allows you to walk around the service area with a laptop PC and do simple analysis of Wi-fi issues. A small USB device (Wi-spy) is used to characterize local RF activity, and the software combines that information with that gathered from the PC's Wi-fi card to tell you what networks are available, their signal strengths, interference sources, and non-standard channel usage. The analysis results in a link score (100 being the max) and more importantly the software tells you how to improve that score (for example, by changing channels).

MetaGeek inSSIDer

If you find the software-based solution inadequate then you can always opt for a hand-held tester such as the Fluke Aircheck. This device would be especially handy if you were setting up a new Wi-fi access point at the station, or transmitter site, or even at a temporary site (a remote broadcast, for example). For starters, it performs tests to see whether the proposed location will even work by looking for already existing Wi-fi and non-Wi-fi signals on a channel by channel basis, as well as for interference sources, which can include microwave ovens, cordless phones, and Bluetooth devices.

Assuming you find your proposed site will work, and you complete the install, Aircheck can then be used to perform tests to see how well your new Access Point is working by playing the role of a Wi-fi client, associating itself with the AP, requesting an address by way of DHCP, and then pinging the gateway or other user-defined addresses. If the site develops problems later on, you could use Aircheck to verify the coverage, analyze interference, security settings, and even potentially negative effects of rogue access points. It can determine if channels are overloaded due to Wi-fi traffic or interference and/or overlap with other APs.

Fluke Aircheck

Even with the proliferation of wireless devices, cable (and fiber) testers play an important role in the broadcast plant. For the hard connections you may want to consider a device such as the Fluke LinkRunner

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INOVONICS BROADCAST

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Fluke LinkRunner AT

AT (LRAT-2000). Not only will this device help you figure out simple issues at the physical layer (i.e., cable and connector issues), but it will do much more. For example: Say you find yourself walking into a new radio station or an otherwise different rack room loaded up with Layer-2 switches and Ethernet patch-fields. Labeling is (shall we say) sub-standard. You have no idea where Ethernet cables that start out in the sales office (for example) end up in this room. So what do you do? Well you could plug the LinkRunner into the far end mystery Ethernet jack and find out quickly where it shows up in the computer room. The connectivity test (using LLDP or Cisco CDP or EDP) will tell you the name of the switch to which you are connected, along with its management IP address and the port, slot and VLAN of the mystery Ethernet jack and even its duplex and speed configuration, along with the actual (measured) speed and signal strength. Is this jack for a VoIP phone by chance? Well the LinkRunner will also tell you the PoE voltage and the ability of the jack to pass current.

About a year ago I was bringing up a new 100Mb/s Ethernet radio that connected Clear Channel's NYC backup facility in New Jersey with our backup transmitter site at 4 Times Square and an issue arose: What do I do to test the Ethernet throughput of this system? I knew the link was working at the Layer-3 level because I was using a browser to communicate with the far-end radio. I could have used a LinkRunner for purposes of testing a radio link such as this, because another one of its features is its packet reflector mode, which allows it to be used as a remote device for throughput tests to validate LAN or WAN connectivity (up to 1Gb/s). The originating device for a test such as this would be anything that generated 802.3 frames or IP packet streams.

SOFTWARE TOOLS

Surely there must be plenty of software offerings out there that allow you to test networks just by plugging an Ethernet cable in to your computer, right? Well let's take a look at just one: PacketCheck from GL Communications. PacketCheck is a PC-based Ethernet/IP testing application with the following features (among others):

> It can transmit or receive full-duplex Ethernet/IP/UDP traffic at rates up to 800Mb/s for testing of LANs or WANs

> For Metro Ethernet testing, it supports stacked VLAN with customizable Type Field, VLAN ID and Priority.

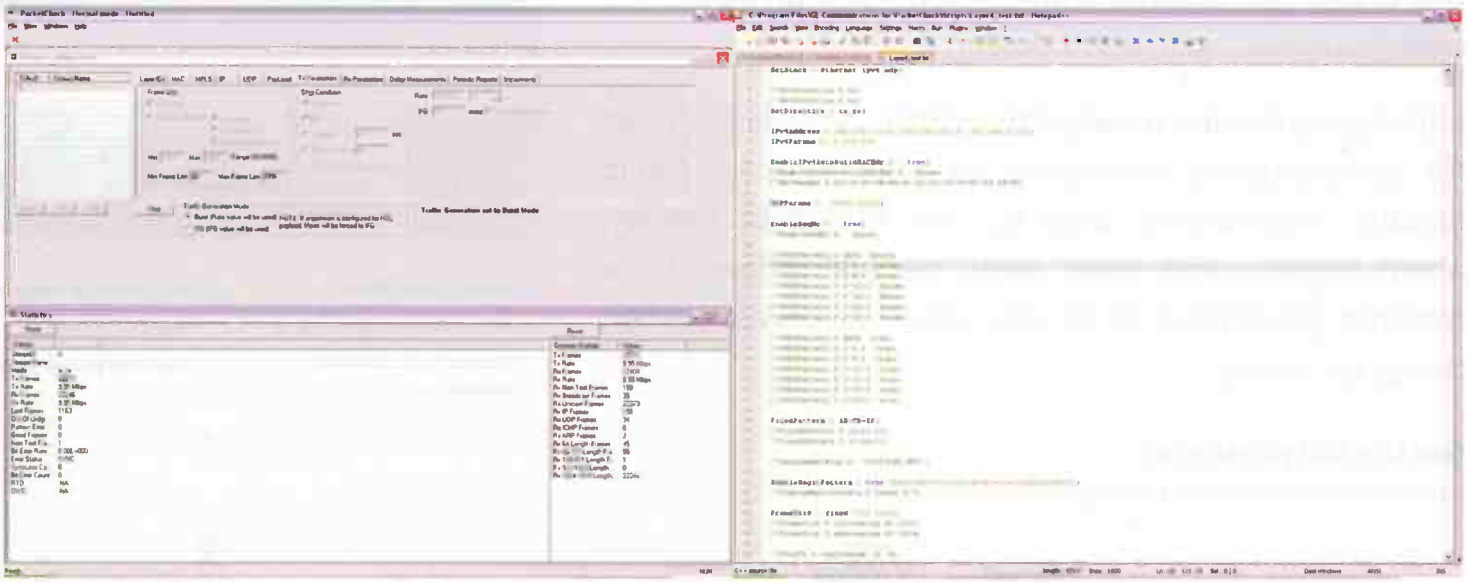
> For MPLS testing, it supports customizable stacked MPLS with Label, CoS and TTL fields.

> It will generate multiple streams simultaneously, each with independent configurations.

> Monitors performance specifics such as throughput, round trip delay, one-way delay, total packets, packet loss, out-of-sequence frames, correct frames, and error frames.

It's important to note though that the looped measurements require another PC at the far end that turns the data back around and returns it to you.

PacketCheck Command Line Interface (CLI) supports all the functionalities of PacketCheck that can be accessed via commands, instead of the GUI. The CLI can be accessed through GL's proprietary WCS (Windows Client Server) architecture, thereby allowing remote execution of commands.



GL Communications PacketCheck screenshots

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You may have noticed by now that as I continue with the devices in this article, the price point continues to rise. I hesitate to write "if money were no object ..." because this is broadcasting after all, but if you have adequate money to allocate to this sort of test equipment, then you should at least take a look at the JDSU SmartClass Ethernet. This is a very powerful hand-held network testing device with the following features (and more):

> Electrical and optical testing in one package; cable diagnostic tests checks cable length, type, and displays type of fault and distance. Optical power measurement to check laser levels.

> Line rate traffic generation at Layer 2 and Layer 3

> IETF RFC 2544 for throughput verification and line qualification

JDSU SmartClass Ethernet

This would be the kind of device you could carry around as opposed to a laptop PC. (It certainly has an advantage over a PC in that it has the optical power measurement capability.) Its ability to generate ping and traceroute messages means that you can test out WAN connectivity easily enough. It has both a loopback and a traffic generation mode, which implies that you would need two such devices for end-to-end testing.

Having the right tools for the job is the key to getting it done quickly and efficiently. Tools for testing Ethernet and IP connections are now no less important than are DVMs, wattmeters or audio analyzers, and a well-equipped shop should include will have them all.

RESOURCES

Fluke Networks
flukenetworks.com

Global Communications
gl.com

Hobbes
hobbes-europe.com

JDSU
jdsu.com

MetaGeek
metageek.net

Tripp Lite
tripplite.com

Irwin is RF engineer/project manager for Clear Channel Los Angeles. Contact him at doug@dougirwin.net.

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ARC-10BP-Blue $2,795

ARC-15BP-Blue $3,795

www.arrakis-systems.com

970.461.0730

World Radio History

Red River Radio

After 28 years in temporary facilities, it was time for an upgrade.

By Kermit Poling

Red River Radio's move to new studios was long overdue. Housed for 28 years in "temporary" buildings that were installed on the Louisiana State University Shreveport campus in 1964 (originally as the campus snack shop), our public radio network needed a new home. Flagship station KDAQ went on the air in Shreveport in 1984 with three repeater stations and a translator added over the next few years. As the NPR affiliate for Northwest and Central Louisiana, South Arkansas and East Texas, geographically we are one of the largest public radio networks in the system.

The metal buildings were in poor condition, a rat's nest of patchwork repairs behind racks was a confusing mess, and even the custom-built Ward Beck console in the MCR had been so cannibalized over the years that there were few cures left for any new problems. (Open slots in the mainframe did leave a convenient space to warm one's hand on a cold day or to provide shock therapy as needed.) With the studios and offices in different buildings, work flow and communication were complicated, especially on a rainy day!

Feasibility studies confirmed that the best solution was a new home. Plans were initiated to build a new facility from the ground up. Priorities included more space, more production capability and routing to better accommodate all of our audio streams including our main channel, HD2,

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SEE-THROUGH STUDIOS

One important visual design aspect of the new performance studio is a large glass wall on the lobby side. Besides catching the attention of those walking into our building, it allows anyone in the control room to look straight through the performance studio to see anyone at the front door, a fringe benefit. The design included non-parallel side walls and the big glass wall is broken up by perpendicular segments. On the MCR side, the windows were all angled and large acoustic insulating doors were installed. (The doors had to be wide enough to easily allow for large musical instruments). In addition, 48 custom designed, locally built absorbing panels contribute to give us a warm sounding, flexible studio. The studio is large enough to accommodate performers and a small audience of about 40-50 people.

We wanted to be as "green" as possible, so all new lighting is LED and the floor is made from reclaimed wood in the performance studio and lobby areas. (The MCR, Production 1 and the Newsroom have carpeting.) Extra care was given to the air conditioning to assure that it was efficient and that there was no noise introduced from the ductwork into the studios. The offices and production studios are on opposite sides of the building, providing additional isolation from office sounds.

Early on we decided to use an audio over IP system. CAT-6 cables made interconnection a simple matter. We chose the Axia IQ system for several reasons. NPR -and the PRSS- was upgrading to new receivers built by International Datacasting. These included Livewire so it seemed logical to use Livewire elsewhere. Also, the Axia IQ control surfaces are easy to configure and understand. We do a lot of call-in programs so high quality phone hybrids were essential. We chose Telos IQ6 digital hybrids, which integrate seamlessly with the IQ consoles and Livewire.

The MCR has an additional mixing station connected to the performance studio. A Presonus digital console feeds both Livewire and a recording computer running several programs including ProTools and Sound Forge. Audio files are stored primarily on Glyph drives in the engineering racks for access throughout the facility. The Presonus also mixes live in-studio sound both for audiences and for the performers' monitors.

The MCR and Production both accommodate the board op/host and three guests. Sennheiser mics, primarily MD-421, are at all stations. Local sources include Tascam CD players, legacy DAT machines and a turntable in the control room. (A lot of those old jazz recordings are still on LP.) We also kept two of our Otari half-track analog machines so that old archival recordings of the symphony, opera, etc., could be transcribed and converted to digital at some point.

WireReady's ControlReady automation had worked very well for us over many years. The old studios ran an old version on computers running Win2000 so upgrading to the latest version on "modern" computers was a no-brainer. One of WireReady's strongest benefits is very reliable walk-away background automation which we use extensively especially on HD2 and HD3.

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- Bud Walters, The Cromwell Group, Nashville, TN

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Photo by Neil Johnson

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The mixing station

Several of the IQ features were not yet enabled by Axia in their software. Time being of the essence, we opted to use Broadcast Tools AES switchers. Eventually we will use Axia's Pathfinder software to handle the routing duties. Commands can be either automated or manually activated. Any of the studios can be used on-air on any of the audio streams or all of them at once, useful during fundraising pledge drives.

Protected studio circuits have both battery backups and an Eaton generator with an automatic transfer switch to keep us on the air in bad weather. Multiple data networks were set up for Axia, Internet and phones. One surprise - the electrical contractor had wired about half of these incorrectly and then didn't mark the terminations back in the engineering rooms. We ended up with a lot of unexpected toning and replacing of connections.

Red River Radio not only uses a satellite downlink for network programming, but we also use the same dish as an uplink to the PRSS which serves as our STL to our transmitter sites. This enabled us to decommission all of our microwave hops while at the same time maintaining an extremely reliable relay of programming. Radyne DMD20s at all sites effectively create our own private data network from ground to satellite to ground.

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ProTools 10
Radyne DMD20
Sage Digital Endec
Samson Servo 1200
Sennheiser MD 421
Sound Forge 10
Tascam CD-500B
Telos IQ6
WireReady ControlReady software
Various mics from AKG, Shure, Neumann

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The performance studio provides ample space for performers and audience.

Omnia units. We have an ample number of Axia nodes for interconnecting devices and these ultimately send AES audio to the Omnias. From the Omnia processors audio data goes to our Harris Importer and Exporter and then out to the satellite system.

In the short time we have been in our new studios we have received many compliments on our improved sound and have had very few technical glitches, at least those of the kind that can be heard by our audience. We've already held a half-dozen live music events and these have validated the extra trouble we went thru for the performance studio. The long hallways on either side of the performance studio have been turned into galleries for visual artworks, which are changed quarterly. In short, our goal of creating a versatile facility to provide excellent audio, more production capacity and ease of use while being visually attractive for the community has been well accomplished.

Poling is general manager of Red River Radio, Shreveport, LA.

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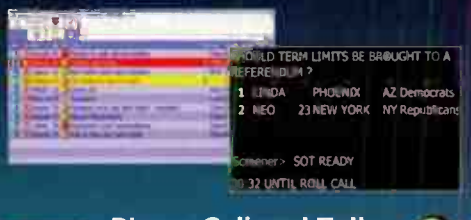

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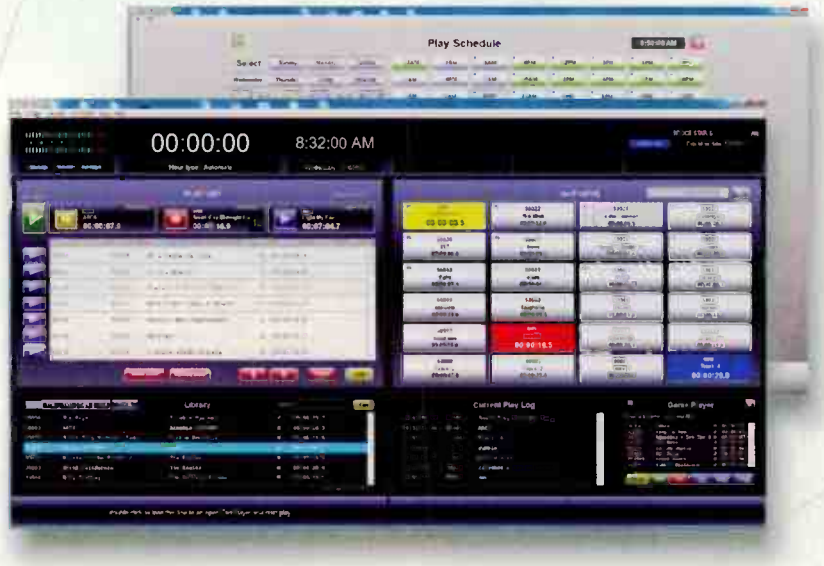

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DATE/ TIME	ACTIVITY
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	>> Proper planning, tests and drills are the best ways to insure a staff is ready when the need arises. This session will offer case studies on lessons learned from actual emergencies.
Wednesday Sept 18 10:15 - 11:15 a.m.	Recovering from the Unexpected Panelists: Andy Laird; vice president and CTO; Journal Broadcast Group * Keith Smeal; director of technical operations; Greater Media, New Jersey
	>> This session will address how some broadcasters weathered disaster and how they recovered with actual case studies to define options for creating an emergency plan to get a business back.
Wednesday Sept 18 1:15 - 2:15 p.m.	Revitalizing AM Radio Moderator: Ben Downs; VP/GM; Bryan Broadcasting Panelists: Michael Cooney; vice president of engineering and CTO; Beasley Broadcast Group * Glynn Walden; senior VP; CBS Radio
	>> Join the dialog about AM improvements, including increased power, all-digital transmission and translators. Bring your own ideas and join the discussion.
Wednesday Sept 18 2:30 - 3:30 p.m.	Digging Deeper - Discussing AM Technical Enhancements Panelists: David Layer; sr. director, advanced engineering; NAB * Steve Lockwood; partner/sr. engineer; Hatfield and Dawson * Ronald Rackley; principal; du Treil, Lundin and Rackley
	>> An in-depth, open, technical discussion of various options to revitalize and enhance the AM band, including FCC rule changes, antenna systems power considerations and all-digital operations.
Friday Sept 18 9:00 - 10:15 a.m.	Efficiencies and Cost Savings: Slash Your AM Power Bill Presenter: Gary Liebisch; digital sales manager; Nautel >> Learn what MDCL is and how an inexpensive modifications to an existing AM transmitter can lead to significant operating
	costs savings. MDCL can be accommodated inexpensively in most modern transmitters from all manufacturers with little or no ill effects.
Friday Sept 18 10:30 - 11:45 a.m.	Efficiencies and Cost Savings: Simple Flexible Studio Design Using AoIP Moderator: MaryAnn Seidler; vice president - sales; Tieline Presenters: Gary Kline; senior vice president, engineering and IT; Cumulus Media * Paul Shulins, director of technical operations;
	Greater Media Boston * Shane Toven; coordinator, engineering; Wyoming Public Media >> Learn how to save money and provide flexibility for studio changes at the same time by considering a conversion to audio
	over IP, which offers many advantages over traditional studio design.

COMMENTS

Other sessions of note

...And the Answer is: What is Radio Regulatory Jeopardy?
September 18
10:15 a.m. - 11:15 a.m.
Gatlin A4
>> A lightning round of quiz show questions address regulatory issues of the day. Players will test their knowledge in various categories.

State of the FM-Enabled Smartphone
September 18
2:30 p.m. - 3:30 p.m.
Gatlin A3
Presenter: Paul Brenner; senior VP/CTO; Emmis Communications
>> A report on the progress made in 2013 as radio gears up for relevant smartphone inclusion.

Radio and the Connected Car
September 19
9:15 a.m. - 10:30 a.m.
Gatlin B
Presenters: Fred Jacobs; president; Jacobs Media/ jacAPPS
Roger Lanctot; associate director, global automotive practice; Strategy Analytics
>> A detailed insight into radio and the connected car including a look at the key players, what's coming, what consumers want, and strategies for radio.

NRSC Meetings
Thursday, Sept. 19
9 a.m. - 12:30 p.m.
Room: Gatlin E1
>> Open to all industry professionals with an interest in current or future National Radio Systems Committee activities. The focus is on technology applications and implementations.

NOTES Opening Keynote:
Wednesday, Sept 18 -- 4 - 5 p.m.
FCC Acting Chair Mignon Clyburn will open. NAB President/CEO Gordon Smith and RAB President/CEO Erica Farber will also speak.

AND -> >>Marconi Awards<< Thursday, Sept 19, 6 p.m.

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Juan Turner, Energy FM

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RADIOSHOW
Marketplace Map

BSI
Booth 217

ERI
Booth 309

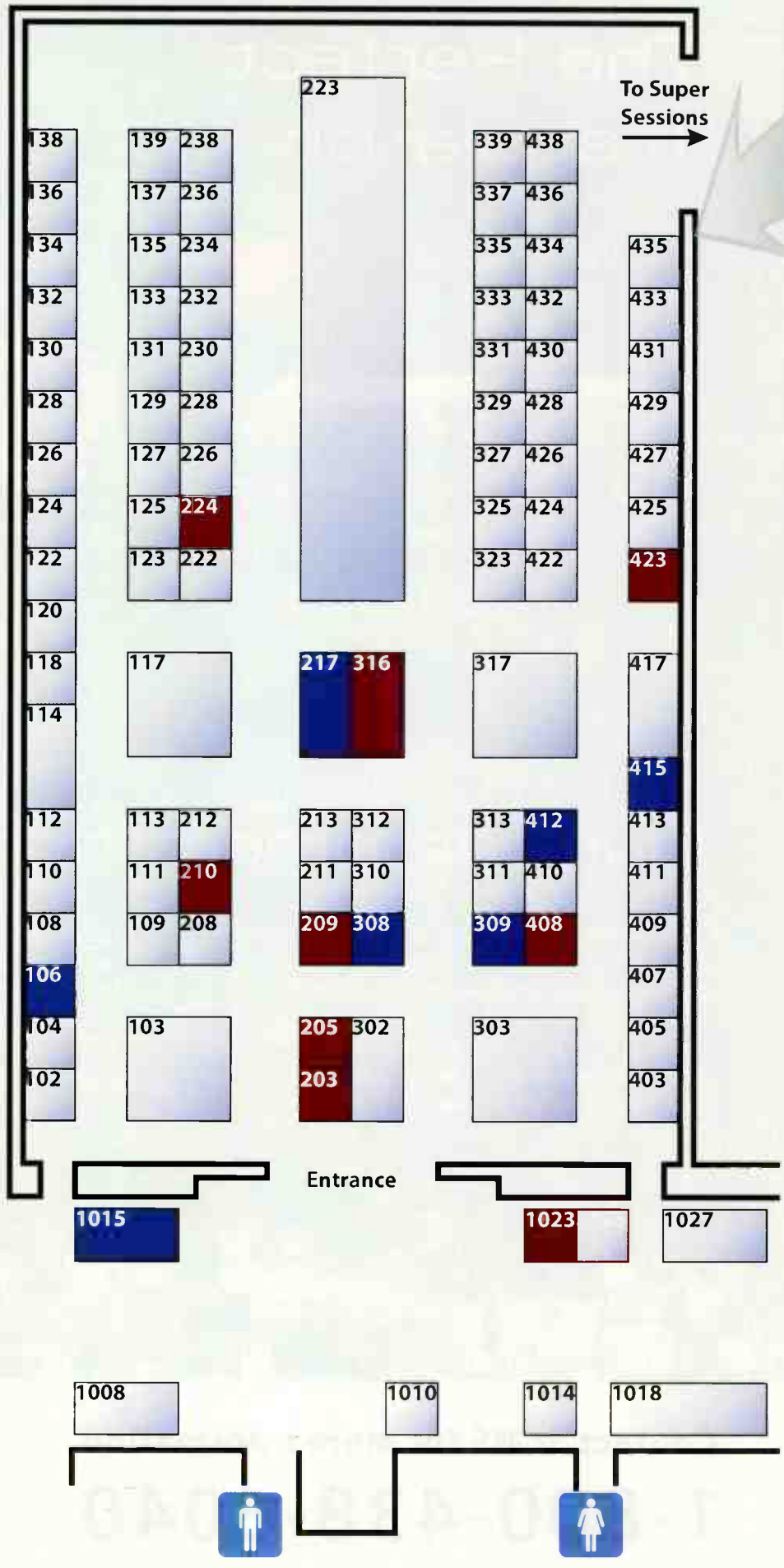
nautel
Booth 1015

Powergold 12
Booth 412

RF Specialties Group
Booth 106

Shively Labs
Booth 308

Tieline
The Codec Company
Booth 415



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Rosen Shingle Creek convention area

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Map Highlights Issue Advertiser

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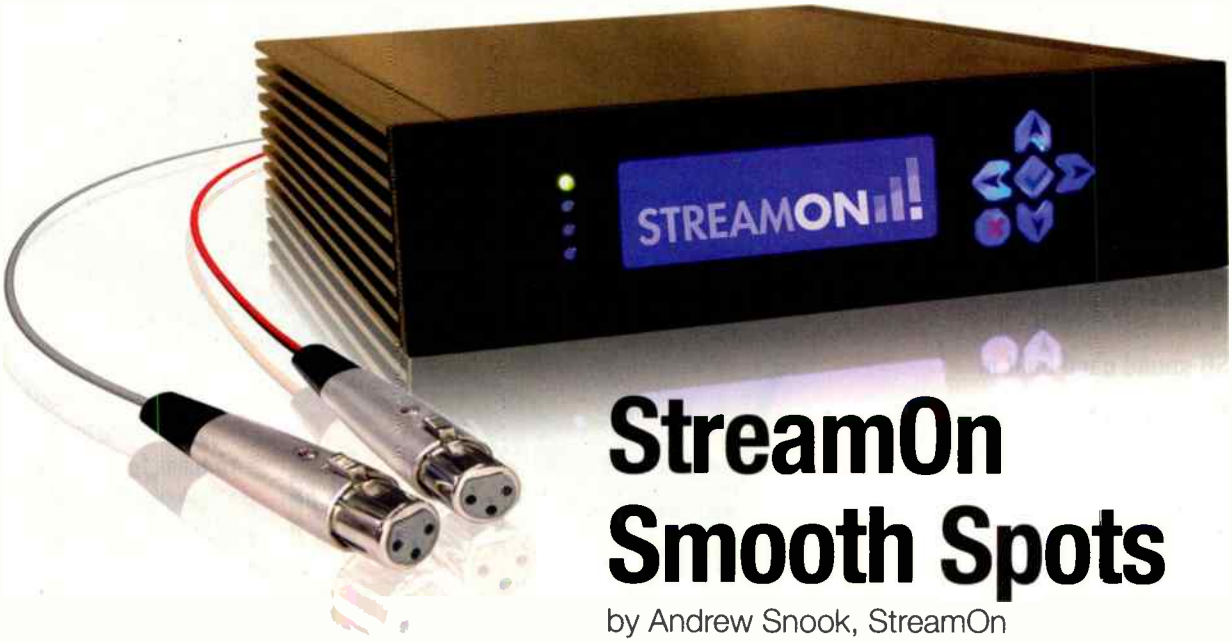

StreamOn Smooth Spots

by Andrew Snook, StreamOn

As a radio listener I find commercial breaks to be incredibly frustrating. It's not because I have a general dislike for advertising, it's because my radio of choice happens to be my computer and on some of the streams I listen to, ad breaks regularly cut in and out at the wrong times. Here is a common listener experience:

The on-air host teases the audience by announcing that an interesting segment will be coming up right after a few messages.

Ears perk up in anticipation.

An ad begins: "We're having the biggest sale ever wi..."

Ad insertion kicks in with a new set of ads, targeted for the Internet audience.

This leaves the listener confused. "What just happened? What is the big sale event for?"

Frustration is further fueled when the ad insertion break ends and the listener discovers he has joined the interesting segment partway through.

This type of experience hurts radio advertisers, diminishes radio brands and encourages listeners to explore other options like Pandora.

STREAMON
951-801-2309
streamon.fm

A COMPLICATED PROBLEM

The source of this problem originates at the studio where audio and metadata go through separate process chains before they are joined together by the live streaming encoder. For instance, the audio feed needs to go through signal processing and PPM encoding equipment before it can be encoded into an Internet stream. Because the audio feed consists of only raw PCM audio, more information is needed by the streaming encoder to determine what song is playing as well as when commercial breaks begin and end. This metadata information comes from the radio automation system, which can be configured to signal the streaming encoder on event changes with now playing information.

Streaming audio encoders are responsible for inserting ad replacement cues into the stream based on metadata information. This creates an extremely challenging problem where the encoder must synchronize a raw audio feed that arrives through one chain of processes with metadata signals that originate from a separate place. The problem is further complicated by the large variety of different automation systems that are available. Some of the older systems make ad replacement particularly challenging, as metadata output features was designed for RDS encoders and now playing sections on station websites where timing is not that critical. On these legacy systems, a metadata cue may come at precisely the right time on one event change and be delayed by a second or two on the next update. This is not a big deal for a station website but when this data is being relied on to handle precise ad insertion timing it creates a big problem.

Some automation systems send data directly over UDP and TCP, which provide consistent timing, but others use protocols such as HTTP, FTP, Windows File Shares and even serial cable connections, which can delay the transmission process and impact ad insertion timing. The data itself is sometimes encapsulated in standards-compliant XML, other times it arrives in uniquely formatted XML, comma separated lists, HTML with tables and several other proprietary formats. The amount of data can range from just a mere Title and Artist truncated to 28 characters to 100kB files with full stack updates listing every song queued up for the next hour with normalization levels, song descriptions and millisecond-precise durations on each event. This enormity of possible combinations requires streaming encoders to use complicated parsers that can add further latency to the ad insertion cueing process.

SMOOTH SPOTS

To address ad insertion timing and other streaming challenges, StreamOn provides

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broadcasters with a dedicated piece of hardware called a StreamOn Appliance. This equipment is passively cooled, has no hard drive or fans (common failure points on computers) and runs a flavor of Unix built for long-term robustness. Using a StreamOn Appliance rather than a software encoder on a Windows machine ensures that the encoder does not have to compete with other system processes such as Anti-Virus software that can cause periodic CPU spikes and create latency.

The Listen Later interface shows clearly separated events produced with the Smooth Spots algorithm.

The StreamOn Appliance runs a chain of processes designed to make ad insertion as smooth as possible. We call this our Smooth Spots solution. The chain of processes work as follows:

1) Rather than having one big program to deal with metadata and encoding, the appliance runs a series of separate processes to handle specific tasks. The first task for handling metadata is to insert a timestamp into the audio feed. The moment that a signal from the automation system arrives we produce a floating point Unix timestamp with microsecond accuracy (i.e. 1372440050.123456) and inject that value directly into the audio feed.

2) The system then proceeds to parse the automation data to determine the type of content that just began playing as well as artist and title information. We do this after injecting the timestamp into the feed rather than before as the parsing process can sometimes

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Monitor Amplifiers

by Chriss Scherer, editor

It's probably the most set-and-forget item in any studio: the monitor amplifier. And their reliability has become so good that they seldom fail, only adding to their forgotten status. Several brands are commonly found in the rack, including Crown, QSC, Yamaha, Ashly and Crest. But there are other options, too.

More and more, active monitors (with the amp built in) are being installed, but depending on the layout, it may be desirable to separate the amp and monitor.

There are two methods of cooling: active and passive. Active uses a fan to force air for cooling. This could contribute to room noise. Passive, convection cooling is the quietest, but the amp must be mounted to ensure it can dissipate the heat.

Power selection depends on use. A smaller amp has a lower output level (obviously), which can help keep overall facility levels down when multiple studios are in use. But if a smaller amp is pushed, clipped peaks could cause other problems and possibly even damage a monitor. The amp will also run hotter. Consider choosing the next larger amp power in the family if this is the case.

For this installment, we considered models that provide 50 to 100W, which is perfectly suited for a small studio for news, voice-overs and production. In some cases, there are other power levels within the same product family.

Alesis RA300

This family of amps is designed to provide more power and better performance at a lower overall cost per watt. The amp uses convection cooling for heat dissipation, so there's no added noise in a studio. It's 2RU and delivers 150W per channel at 4Ω, 90W per channel at 8Ω or 300W bridged into 8Ω. It's signal to noise ratio is >105dB, with a frequency response of 10Hz to 70kHz. Distortion is <0.02 percent at 4Ω, 20Hz - 20kHz. Other models in the series include the RA150 and RA500.

alesis.com

ART SLA1

The SLA-1 studio linear amplifier is rated at 100W per channel into 8Ω, 130W per channel into 4Ω, or 250W bridged mono into 8Ω with a frequency response from 10Hz to 40kHz. Occupying 1RU, the SLA-1 uses a toroidal transformer design for reliability. Cooling is provided via SmartFan, an advanced, thermal-dependent, fan-assisted, convection-cooled system. Connections are made via XLR and 1/4" TRS balanced inputs and multi-way output binding posts. A tamper-proof cover is included. Total harmonic distortion is <0.05 percent. Also available is the SLA2.

artproaudio.com

DAS Audio PS-200

Housed in 1RU, the low-noise fans keep things cool, while the toroidal transformer saves weight. Rear-located switches that permit ground lift, operational mode selection (bridge, stereo or parallel) and input sensitivity selection. It delivers 70W into 8Ω, 100W into 4Ω and 200W bridged mono into 8Ω. Frequency response is 20Hz to 20kHz, and distortion is <0.05 percent. Connections are made via XLR and 1/4" TRS balanced inputs and output binding posts. Also available are the PS-400, PS-800, PS-1400, and PS-2800.

dasaudio.com

Dixon Systems SA-240

This 1RU stereo power amplifier provides 40W per channel into 8Ω. Inputs are XLR connectors through a filtered audio module. Outputs are biding posts. There is a front-panel headphone jack for monitoring. Distortion is rated at <0.02 percent at rated output. A custom, shielded toroidal power transformer reduces weight and provides ample power. The protection system will shutdown on a short and reset when power is removed.

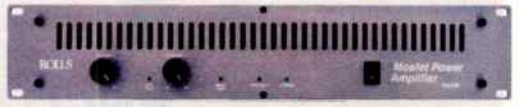
dixonsystems.com

Samson Servo 300

Large 10-segment, three-color level LED meters show levels of this 2RU amp. It has 1/4" balanced and RCA inputs, and five-way binding post and 1/4" speaker outputs. It features a four-stage power protection circuit to provide 100W/channel at 8Ω, 150W/channel at 4Ω and 300W mono bridged into 8Ω. Frequency response is 10Hz to 55kHz, and distortion is 0.04 percent. A toroidal transformer provides the system power, and it's kept cool via two variable speed fans. Also available are the Servo 120A, Servo 200 and Servo 600.

samsontech.com

Rolls RA200



This 2RU steel chassis amp provides 100W per channel into 4Ω, 70W per channel into 8Ω, and 200W bridged mono into 8Ω. The MOSFET output stage is fault protected to allow the amp to forgive momentary output shorts. The unit is convention cooled so there is no fan noise, and it features a one-second delay time for power-on. Input connectors are 1/4" TRS and RCA. Output connectors are binding posts. Distortion is rated at <0.08 percent.

rolls.com

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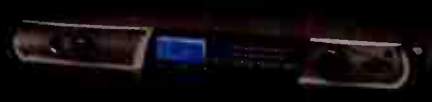
OmniaAudio.com/one



Omnia

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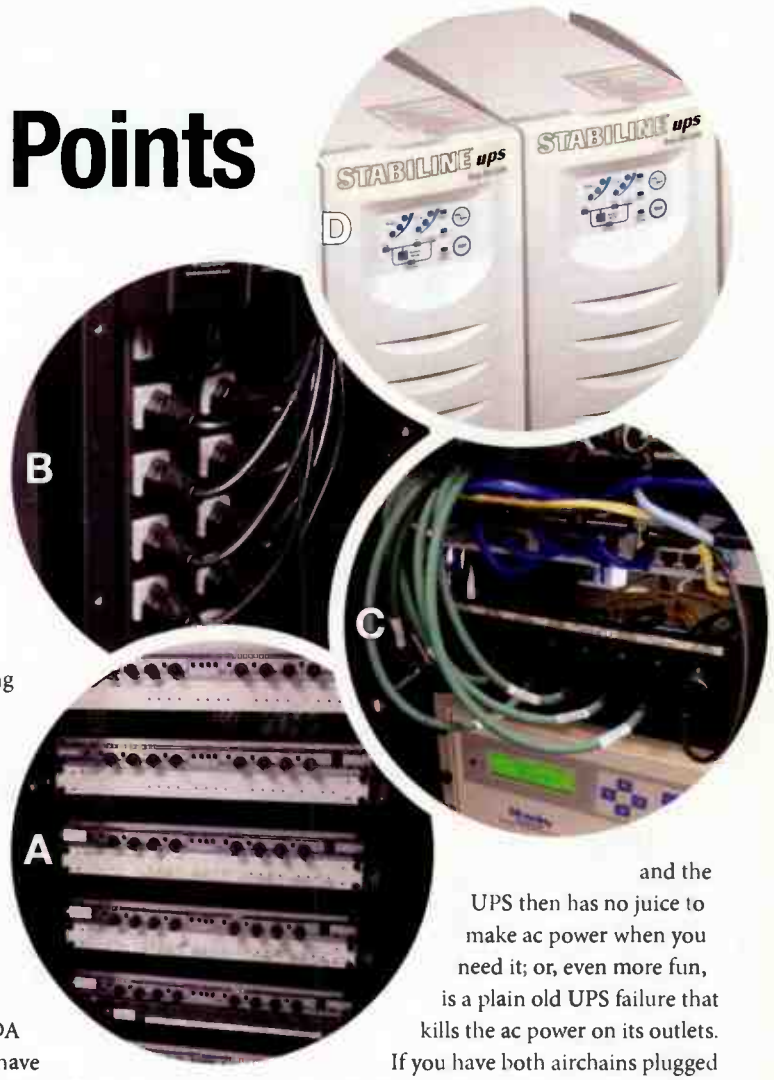
Subtle Single Points of Failure

by Doug Irwin
CPBE DRB AMD



It's easy to have a second (or third) transmitter in place and working, and to have a second (or third) STL working, and to think that you're golden and nothing can knock you off the air. I mean, those are the two things most likely to knock you out, right? Maybe. Let's take a look at some of the more subtle single points of failure at the radio station.

AC power outlets. (A) I have often seen redundant systems that in fact were all plugged in to the same ac power strip and therefore the same circuit breaker. So what could happen? Well, use your imagination a little bit: Someone could plug the wrong thing in to that same circuit — a heat gun, a vacuum cleaner (that's a classic) or perhaps an incorrect fuse causes a near power supply meltdown in one piece of equipment on that circuit. Solutions:

> If main and backup airchains are in the same rack, add a second outlet strip, from a different circuit breaker, and separate the chains by plugging them in to different ac circuits, or

> If you have two racks, move one airchain to a different rack. Make sure aren't both fed from the same breaker.

We often focus on what is done at the transmitter site more than what is done at the studio location. Take some time and look at both locations.

Single DA feeds multiple airchains. (B) I have seen many studio outputs connected to a DA that ultimately feeds more than one airchain. In this case you set yourself up to be taken off the air by one blown fuse or one failed voltage regulator inside the DA (a common occurrence). Another classic is having the DA on the output of a main/backup studio switch. Solutions:

> Wire the DA to bridge the airchain so the airchain does not actually go through the DA circuitry.

> If you insist on having a DA in the airchain, have a separate DA for each airchain and make sure they're plugged in to different ac circuits.

Main/backup studio switcher is active. (C) This is really a corollary to the DA issue. It's important to have a backup studio plan in place at your studio location. However, I don't like using active circuitry for that because it's just one more thing that can fail, taking you off the air. Solutions:

> Use a passive switcher based on magnetic latching relays. In that way, no power is needed to hold the switch to be in the correct position. Make sure it has remote control capability so that you don't need to drive in just to move a jock to a different studio.

> Use a patchbay or some other electro-mechanical switches that you can describe and explain over the phone to a panicked jock who calls you after hours. (First option preferred, of course.)

Both airchains plugged in to one UPS. (D) This is another very common mistake, at both studio and transmitter locations. Having a UPS inline is great to bridge the gap between the power in the racks and a generator starting up and coming online. The trouble is that after two or three years the batteries are generally bad, and the UPS then has no juice to make ac power when you need it; or, even more fun, is a plain old UPS failure that kills the ac power on its outlets. If you have both airchains plugged in to it, well let's just say you're going to have a bad day. Solutions:

> Carefully plot main and backup airchains and make sure that a complete ac power failure for one will not prevent you from using the other; put one airchain on the UPS, and leave one off of it.

> Add a second UPS, with one airchain on one, and the second on the other, plug them in to separate ac circuits.

> Obtain a UPS that has HTTP support and provides a means by which you can see if it and the batteries are healthy.

> Obtain a UPS with SNMP support and have your SNMP manager continually measure the UPS parameters.

If you really want a robust system then you need to go through it, end to end, with a fine-tooth comb, and look for all the potential problems.

Irwin is RF engineer/project manager for Clear Channel Los Angeles. Contact him at doug@dougirwin.net.

WE NEED YOUR TIPS

Tech tips may be suitable to earn SBE recertification credits. Send your tips to radio@RadioMagOnline.com.

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BSI
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Acoustic panels | Auralex Acoustics

Studiofoam T: Studiofoam T provides the absorption performance of Studiofoam with a more contemporary look. Studiofoam T eliminates standing waves and flutter echo while reducing unwanted reflections. The unique 2" profile is available in a 2'×2' or 2'×4' format and can be mixed with other Auralex Studiofoam profiles, making possible a wide variety of aesthetic designs. The new panels' unique design features a repeating T profile pattern, making them appropriate for a variety of professional and residential applications. The panels are available in three popular colors and are made from Auralex's long-lasting, melamine-free formula, which wonít crumble with age. This upscale design offers increased low-frequency absorption and a tasteful, seamless appearance.
auralex.com

Facility management software | Scheduall

S5: Scheduall 5 (S5) now features smart technology, automating previously labor-intensive functions like slack capacity optimization, media system integration and third-party connectivity. Easily set in place complex projects and project-based workflows; accurately predict if projects can be done in time; automatically utilize slack capacity and load-balance resources; have full-scale, end-to-end visibility into all workflows and their results, and proactive warnings of issues, problems and opportunities. With WebApp, Scheduall can be accessed from anywhere. Easily create work orders and manage resources within or outside a network. Analytics allow comprehensive financial and operational dashboards for in-depth analysis, self-service report customization in real-time, and at-a-glance dashboards.
scheduall.com

Studio monitors | Yamaha

HS Series: The HS Series includes several models. The HS5, HS7, HS8, HS50M and HS80M are all two-way studio monitors. The 5, 7, 8 and 80M have 5", 6.5", 8" and 8" (respectively) polypropylene woofers with 1" dome tweeters. The 50M has a 5" woofer and ¾" dome tweeter. The 50M and 80M are designed with extremely flat frequency response for reference monitoring. The 5, 7 and 8 have internal power amps and deliver 70W to 120W of power depending on the model. The family also includes the HS8S and HS10W subwoofers. The HS8S is powered. The HS10W is also designed as a reference monitor. All models have magnetic shielding for use near video monitors.
yamaha.com/proaudio

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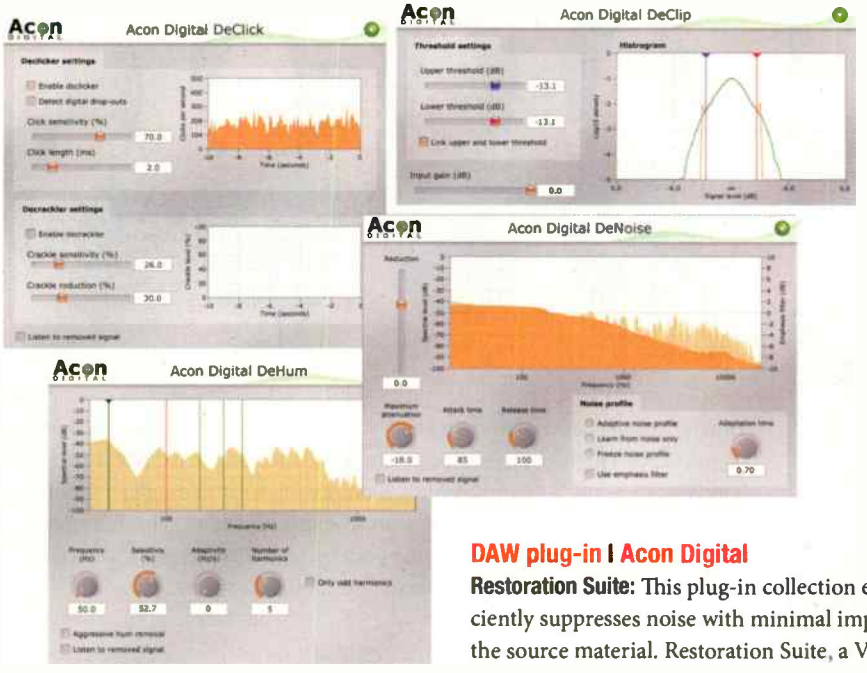


DAW plug-in | Acon Digital

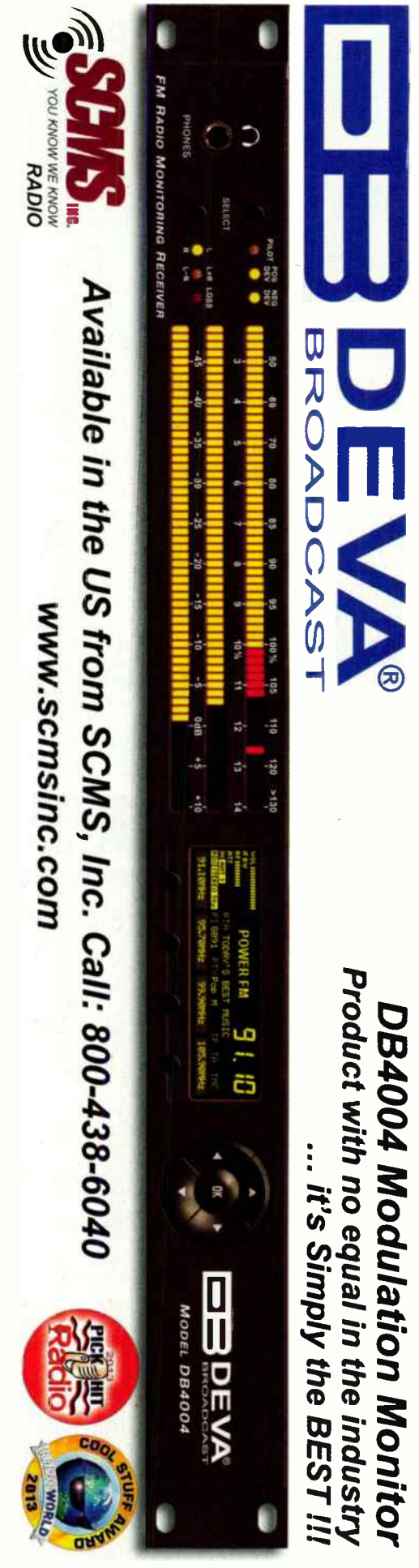
Restoration Suite: This plug-in collection efficiently suppresses noise with minimal impact on the source material. Restoration Suite, a VST or AU compatible plug-in, is the result of years of research and development within the field of noise reduction and audio processing. It includes the tools DeNoise for broadband noise reduction, DeHum to filter out hum and buzz noise, DeClick to remove typical pops and crackles from vinyl and 78RPM recordings as well as DeClip to reconstruct clipped peaks.

acondigital.com

Logic Blade | Wheatstone

LIO-48: The LIO-48 is a high-density logic Blade for the WheatNet-IP Intelligent Network that can handle new conditional logic functions in today's studios. The LIO-48 provides 48 universal logic I/O ports, each individually configurable. A logic I/O meter lets you drill down and see the information for each of the 48 ports. Broadcasters have been asking for more logic ports for new logic-intensive shows and applications, and the LIO-48 now offers this capability in one Blade add-on.

wheatstone.com



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NEWPRODUCTS

Headphones | I-Mego

Throne: Throne delivers clear and heavy audio with a stylish look. Clear audio comes via two high-performance 40mm drivers for deep bass. A leather headband has signature I-Mego stitching. Memory foam ear pads offer comfort and an integrated one-button mic controls music and takes calls. For added convenience, it includes soft carrying pouches as well as adaptors to accommodate any audio source. Available in four models.

i-mego.com

Wireless interview tool | JK Audio

BluePack with HD Voice: BluePack allows live man-on-the-street interviews through a cell phone equipped with Bluetooth wireless technology. The belt pack provides a professional look and feel to field reporters and remote talent. It pairs to a cell phone like a Bluetooth wireless headset. A 3.5mm stereo line input jack allows recordings to be mixed into the broadcast. The 3.5mm stereo line output jack provides the full bandwidth microphone signal on the left channel and Bluetooth audio on the right channel. The stereo headphone output gives a mix of both inputs plus the return audio with a 0.5W stereo headphone amplifier. BluePack also pairs to Bluetooth equipped sound cards and music players in full bandwidth stereo A2DP mode. This system now offers improved voice bandwidth using Bluetooth HD Voice wireless technology. HD Voice is available on many third party headsets and cell phones, offering wireless freedom with improved speech quality.

jkaudio.com

Talkshow system | Yellowtec

b-line Bold: This talk show system fits virtually any installation requirement. Yellowtec's engineers and designers crafted six channels of state-of-the-art telephone hybrid with the connectivity for all common telco systems. Analog POTS and VoIP make b-line Bold as versatile as can be. Features include big, beautiful sound, conferencing capabilities, pre talk in privacy with up to two handsets, and DTMF generator and analyzer making it easy to run contests and game shows. The fully loaded talk show system handles six lines for call in/call out with all the functions of a smart screener system. Touchscreen Talkmaster Software is included.

yellowtec.com

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Digiplexer | ERI-Electronics Research

788 Series Allpass: The 788 Series Allpass high-power HD Radio FM analog/IBOC diplexer features increased power handling to 49kW and a more compact design. Its design allows stations to operate digitally at powers up to -10dBc. This diplexer maintains high efficiency while minimizing group delay and insertion loss.

ERIinc.com

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JULY ISSUE

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Eric Nelson
of Cumulus Media in
Lake Charles, LA.

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Ribbon microphone | Royer Labs

R-121: Drawing on the original R-121 studio ribbon microphone, the 15th Anniversary R-121 limited edition mic features high SPL capabilities; no internal active electronics to overload or produce distortion up to maximum SPL rating; extremely low residual noise; the ribbon element is not affected by heat or humidity; no high frequency phase distortion; equal sensitivity from front or back of element; consistent frequency response regardless of distance; electrodynamic pressure gradient acoustic operating principle; figure-8 polar pattern; 2.5-micron aluminum ribbon generating element; Rare Earth Neodymium magnets; and 30-15kHz frequency response ± 3dB.

royerlabs.com

Radio automation | Tunetracker Systems

System 5: Included in the TuneTracker System 5 suite is Command Center radio automation, TuneStacker music selector, Lightning request finder and program log editor, MakeMyDay master log builder, Army Knife attribute editor, CSacker report generator, and a free copy of Haiku. The suite is available as software-only, and in a variety of "Station-in-a-Box" packages, some of them including satellite switchers. TuneTracker Systems' new automation suite was created for use with Haiku, a free, open-source desktop operating system designed to be fast, lightweight, and stable, like the commercial BeOS operating system it was fashioned after.

tunetrackersystems.com

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Amplifiers | Ashly Audio

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ashly.com

UPGRADES AND UPDATES

BW Broadcast has released a software update for the v2 transmitter line. (bwbroadcast.com) ... **Sprint** is installing the NextRadio application in an array of FM-enabled wireless devices. Data for the NextRadio app is supplied by **TagStation**. (sprint.com, tagstation.com) ... **Wheatstone** has completed the conectivity of its Baseband192 interface with the **Broadcast Electronics** STXe60 exciter. (wheatstone.com, bdcast.com) ... **Pioneer** has unveiled the first eight models of its in-dash receivers for 2014. The DEH-X5600HD includes HD Radio. (pioneerelectronics.com) ■

Bluetooth-enabled radio console | Arrakis

ARC-15BP-blue: Channel 15 on this console can be paired to any Bluetooth-enabled audio device such as a cell phone, MP3 player, MP3 recorder-editor, and more. Just pair a cell phone to the ARC-15 and answer incoming calls with the call button and drop them with the drop button, just like a standard phone hybrid. The caller receives the console busmix so there is no feedback. Or, the user can pair any Bluetooth-enabled audio device such as an iPad, Tablet device, or MP3 player and stream full bandwidth, high-quality stereo (A2DP) audio to channel 15 on the console. If a paired cell phone call comes in, then the stereo stream is dropped and the call can be answered. Arrakis does all of this while still allowing an external phone hybrid to be connected to channel 15 at the same time.

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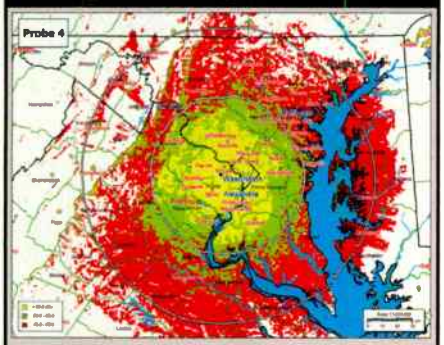

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Z100 Celebrates 30 Years

Station presents to fans the "Z100 Time Capsule," an interactive guide to the history of New York City entertainment's most iconic brand

WHTZ, better known to listeners in New York as Z100, celebrated its 30th anniversary in August. The station presented the "Z100 Time Capsule" to reminisce its 30 years with the community. Z100 continues to connect fans with their favorite music, artists, news, gossip, concerts and events including the annual holiday "Jingle Ball" concert, which has hosted live performances by many big names in music industry.

"Ever since the station signed on, Z100 continues to have such a meaningful impact with its listeners in the Tri-State Area, along with the radio and music industry around the world," said Sharon Dastur, program director for Z100.

In honor of 30 years of entertainment broadcasting Z100 is taking listeners on a journey down memory lane with the launch of the Z100 Time Capsule (z100.com/anniversary), an interactive guide taking listeners back to what Z100.com would be like each year since its launch in 1983. The platform shares behind-the-scenes videos, Z100's evolution of logos and design and, each year's top entertainment statistics, including the no. 1 song from each month of every year, the year's top movies, TV shows, trends and fads.

"For almost 25 years I have been front row watching the evolution of Z100," said Elvis Duran, Host of Z100's Elvis Duran and The Morning Show. "I am thrilled that fans everywhere are now able to see how Z100 became the symbol that it is today, and I am proud to be involved with such an iconic brand in entertainment."

Z100 launched on August 2, 1983, when Survivor's "Eye of the Tiger" was broadcast over the radio waves and the New York City icon was born. Over the next 30 years Z100 has grown into the largest pop/contemporary hit radio (CHR)/top 40 station in the world. Z100's first morning show host and Program Director Scott Shannon helped launch the brand that has successfully transformed over the years under the direction of past program directors including Steve Kingston and Tom Poleman, as well as current Program Director Sharon Dastur all who shaped Z00 into the national powerhouse it is today. Today's well-known on-air talents Elvis Duran, Danielle Monaro, Skeery Jones, Greg T and Bethany Watson as well as JJ, Mo' Bounce and Trey have also helped establish Z100 as New York's Hit Music Station.

And several radio engineers have been a part of the effort to make the station what it is today. Frank Foti, founder of Omnia and CEO of the Telos Alliance was the chief engineer when the station began. Foti says Joe Knapp and Gerry Westerberg also had a hand in signing it on.

After Frank Foti, the list of chief engineers includes Jim Somich, David Reaves, Rob Mueser and Josh Hadden.

Top: Scott Shannon, Steve Kingston and Frank Foti (l-r). *Bottom:* Z100's newsroom (far left), main studio (left) and commercial production studio (above) in the 1980s.

More photos at RadioMagOnline.com. All photos courtesy of Hall Knapp, Clear Channel New York, and Frank Foti, Telos Alliance.

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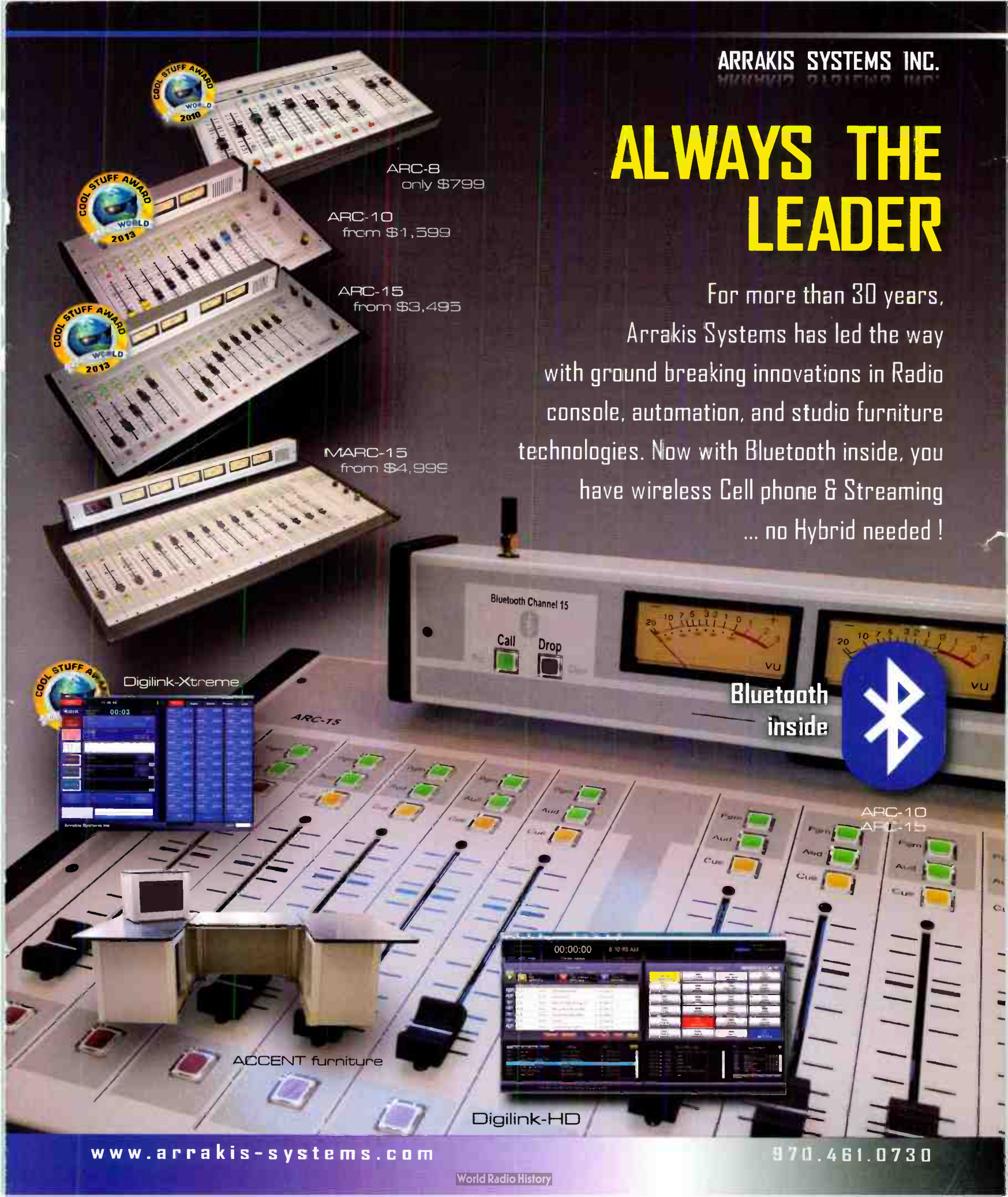
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