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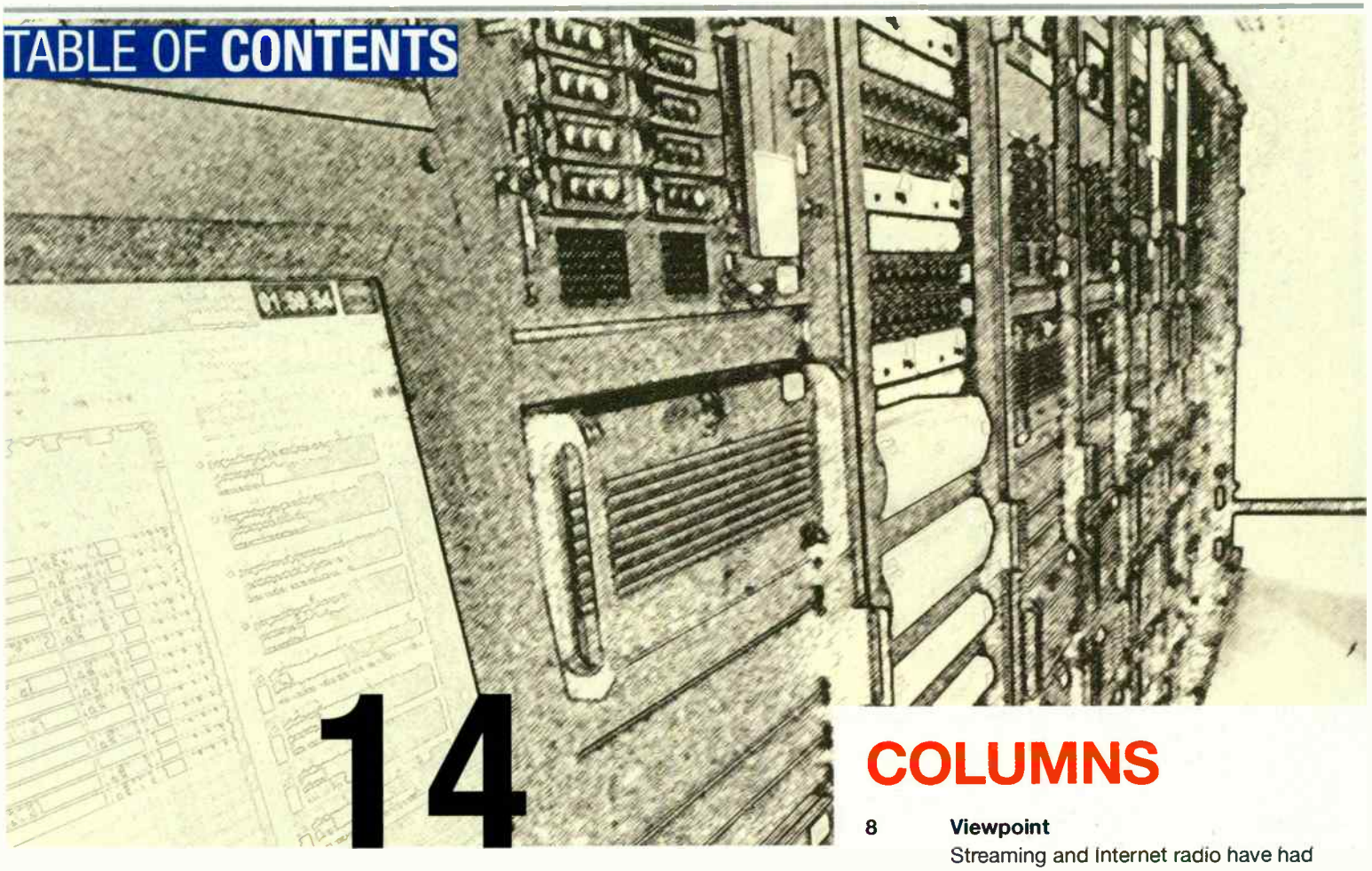

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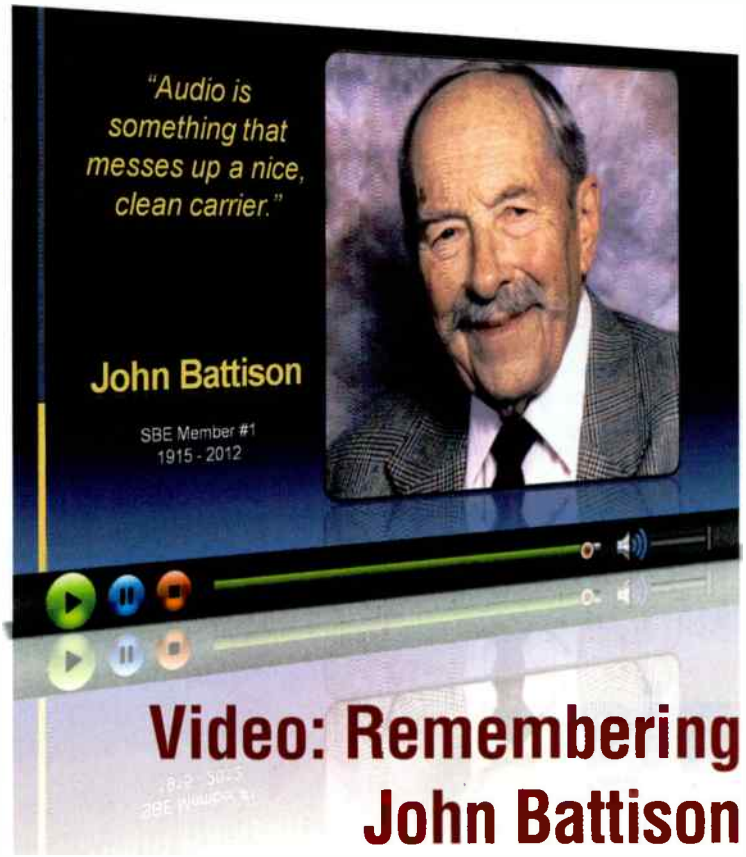

Video: Remembering John Battison

At the Society of Broadcast Engineers 2012 National Meeting Awards Banquet, *Radio* magazine Editor Chriss Scherer presented a tribute to John Battison, the founder of the SBE and former technical editor of *Radio* magazine. Go to YouTube.com/RadioMagOnline to watch.

Internet Radio Fairness Coalition Launches

The Internet Radio Fairness Coalition was formed by Internet radio services, broadcast radio companies and groups concerned about the future of the Internet radio industry to advocate for legislation that would establish an equitable royalty rate setting standard for Internet radio. The Coalition supports the Internet Radio Fairness Act of 2012, legislation calling for all digital music services to be judged by the same rate-setting standard.

Current members include: AccuRadio, CCIA, Clear Channel Media and Entertainment, Consumer Electronic Association, Digitally Imported, Digital Media Association (DiMA), Engine Advocacy, National Religious Broadcasters Music License Committee, Pandora, Radio Paradise, Salem Communications, Small Webcaster Alliance, and 977 Music.

30%

Arbitron/Edison: Wireless Dashboard Crucial to Online Radio Success

Internet radio has been available in cars for some time now. A study conducted by Arbitron and Edison Research claims the U.S. audience for online radio has jumped more than 30 percent to 76 million people in the last year. The study claims that smartphone growth has been one of the key factors in the rise of online radio, noting that 44 percent of Americans now own a smartphone, and that 17 percent of all mobile owners have listened to online radio streamed in their cars via their phones - up from 11 percent this time last year.

RMLC Files SESAC Anti-Trust Complaint

The Radio Music License Committee (RMLC) has filed an antitrust complaint against SESAC concerning anticompetitive behavior that "allows SESAC to charge the U.S. commercial radio industry monopoly prices to publicly perform musical works in the SESAC repertory." The RMLC represents several thousand commercial radio stations in music license matters with ASCAP and BMI. The filing of the SESAC complaint comes after the RMLC's recent settlements of longstanding litigations with both ASCAP and BMI.

EAS
Emergency Alert System

GSS and iBiquity have teamed on EAS for FM and HD Radio that is CAP-compatible and IPAWS-compliant.

The AVnu Alliance is looking to advance automotive requirements for AVB Gen2, which is intended to carry the technology beyond audio and video applications.

Marketron has acquired Emmis Interactive. Emmis Communications will continue as a core Marketron customer and retain an economic interest in Marketron's success in expanding product and service offerings.

Now that the storm known as Sandy in the history books, take a moment to tell us how you weathered the storm. Send your stories and photos to radio@RadioMagOnline.com.

The 2013 IEEE Broadcast Symposium will be held in San Diego, CA. The 2014 event will be held in San Antonio. The event has always been held in the Washington, DC, area.

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 Hosa USX-100 mic-to-USB interface. Send your entry to radio@RadioMagOnline.com by December 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

A Future for Streaming

Streaming and Internet radio have faced challenges since their start, but despite the troubles, the services continue. Whether it's an issue of bandwidth, royalties, listenership or just ROI, Internet radio continues and at least deals with if it doesn't overcome the challenges.

The Arbitron report "Looking at the Infinite Dial 2012," Internet radio listening has doubled every five years since 2001 and currently exceeds 76 million listeners. It's steady growth, and it's nipping at the heels of terrestrial radio.

The business side of streaming, particularly paying royalties, is probably the biggest hurdle broadcasters face. But there's hope. Streaming rates have been renegotiated several times, improving little by little to the financial benefit of the streamers. With the Internet Radio Fairness Act of 2012 making its way through Congress, the recently formed Internet Radio Fairness Coalition is gearing up to improve the royalty rates across the board.

There's a fair compromise. As a musician, I'm all for artists getting their fair share of any revenues seen from streaming. As a broadcaster, I also see the benefits of airtime exposure. The negotiations will hopefully find a mutually agreeable middle ground for both sides.

One factor in the growth of streaming is the proliferation of portable devices like smartphones. Having the Internet anywhere you go is certainly handy. While we're a mobile society, that mobility is not locked to being on foot. We love to drive our cars. Several studies have noted that the next important step for Internet radio is to better integrate wireless connectivity into the automobile dashboard.

We know that's coming. The classic two-knob and push-button car radio is becoming a thing of the past. Look at the radios—well, sound systems—OK, integrated electronics displays of the current cars. The radio isn't really the center of the dash anymore, but it's still part of driving the car. Internet radio is becoming a bigger part of daily life as listeners find their own niche programming choices. Making it more accessible in the car is the next logical step.

But I know what many are thinking: Streaming will never replace terrestrial radio, especially in times of crisis. I agree with that. We just saw Hurricane/Tropical Storm Sandy ravage the East Coast. Terrestrial radio is the communications lifeline in situations like this. Networks and carriers get overloaded or lose power. Radio stations in most cases are able to stay on the air and provide information.

But emergencies alone are not going to keep terrestrial radio in the foreground. Terrestrial radio will continue to have its place and purpose in listeners' lives. But terrestrial stations can use the technology advances to maintain their businesses while still being available to serve the public interest.

STILL REMEMBERING

The Society of Broadcast Engineers held its national meeting in Denver last month. The annual awards banquet, which honors the recipients of the SBE national awards program, is part of the national meeting events. At this year's banquet I was asked to present a tribute to John Battison, who died on Aug. 28.

I was proud to pay tribute to my friend and colleague one more time by looking back at his life and recalling the history of his efforts in founding the SBE 50 years ago. That tribute was captured on video and we have posted it to the *Radio* magazine channel on YouTube (youtube.com/RadioMagOnline).

Chriss Scherer | Editor

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November 2012 | Vol. 18 No. 11

EDITORIAL
Editor: Chriss Scherer, CPBE CBNT
cscherer@radiomagonline.com
Senior Associate Editor: Erin Shipps
eshipps@radiomagonline.com

TECHNICAL CONSULTANTS
Contact them via radio@radiomagonline.com
Kevin McNamara, Computers and Networks
Jeremy Ruck, P.E., RF and Transmission
Lee Petro, Legal
Russ Berger, Broadcast Acoustics
Doug Irwin, CPBE DRB AMD, IBOC

CONTRIBUTORS
Doug Irwin, CPBE DRB AMD
Chris Wygal, CBRE

CORPORATE
President and CEO: Steve Palm
Chief Financial Officer: Paul Mastronardi
Controller: Jack Liedke
Group Circulation Director: Denise Robbins
Vice President of Web Development: Joe Ferrick

VIDEO/BROADCAST GROUP
Executive Vice President: Carmel King
Vice President of Sales/Group Publisher: Eric Trabb

ADMINISTRATION AND PRODUCTION
Editorial Director: Paul J. McLane
Production Director: Davis White
Production Publication Coordinators:
Karen Lee, Carolina Schierholz
Advertising Coordinator: Caroline Freeland

CIRCULATION
Group Director, Audience Development: Meg Estevez
Circulation Manager: Kwentin Keenan
Circulation Coordinator: Michele Fonville

ADVERTISING SALES REPRESENTATIVES
Associate Publisher, U.S. Sales: Steven Bell
sbell@radiomagonline.com | 212-378-0400 x519
Southern Europe, Africa, Middle East: Rafaella Calabrese
rcalabrese@broadcast.it | +39 02 9288 4940
UK, Ireland, Central and Northern Europe: Graham Kirk
gkirk@audiomedia.com | +44 1480 461555
Japan: Eiji Yoshikawa
callems@world.odn.ne.jp | +81 3 3327 5759
Asia-Pacific: Wengong Wang
wwg@imaschina.com | +86 755 83862930/40/50

Member: American Business Media

A NewBay Media Publication

NewBay Media, LLC
28 East 28th Street, 12th floor
New York, NY 10016

SUBSCRIPTIONS: Free and controlled circulation to qualified subscribers. Customer Service can be reached at: newbay@computerfulfillment.com or by calling 888-266-5828 (USA only) or 978-667-0352 (Outside US) or write us at Radio Magazine, P.O. Box 282, Lowell, MA 01853, USA. Back issues are available by calling Customer Service.

REPRINTS: For custom reprints and eprints please contact our reprints coordinator at Wright's Media 877-652-5295 or NewBay@wrightsmedia.com.

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Radio, Volume 18, Number 11, (ISSN 1542-0620) is published monthly by NewBay Media LLC, 28 East 28th Street, 12th floor, New York, NY 10016. Periodical postage paid at New York, NY and additional mailing offices. Postmaster: Send address changes to Radio, PO Box 282 Lowell, MA 01853.

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Dan Jackson, engineer for 92.9 FM in Perth, Australia was faced with a unique challenge. Breakfast hosts Paul Hogan and Lisa Fernandez would be cycling for hours in strong winds and pouring rain as part of the 92.9 Kids Appeal for Telethon.

The unique solution was to equip Dan's bike as a mobile production facility. The talent wore wireless mics AND in-the-ear monitors which communicated with receivers and transmitters in a rack bag on Dan's bike.

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Selecting an FM Antenna

by Jeremy Ruck

Selecting an FM antenna for use at a facility is much like choosing any other component: Some cost more than others, some are of higher quality than others, and some have different technical characteristics that lend themselves to different applications better than others. Regardless of which antenna you select, the best quality antenna you can afford should be chosen as this is the last item in your transmission chain, and the last point over which you have control of your signal.

Factors to be considered before making a purchase include local climate, effective radiated power, transmitter power, tower loading, population concentrations in your coverage area, directional patterns, and non-ionizing radiation protection. Your consulting engineer together with your sales representative are valuable resources to aid in the decision.

The accumulation of ice on an antenna will affect the match presented to the transmitter. It does not take much ice to present a load that will cause foldback or even VSWR trips. Icing tends to be most frequent in areas such as the plains and Ohio valley states. De-icers or radomes will limit the effect of ice accumulation. De-icers, which do not really de-ice but only aid in preventing ice from accumulating, are both costly and maintenance intensive. Radomes on the other hand do not fail unless physically broken, but can add a substantial amount of loading to a tower. Southern coastal areas do not require either for ice protection, but the addition of radomes may be desirable in some cases to limit element corrosion from salty air.

POWER DETERMINATION

Stations are of course licensed by their effective radiated power. For a given ERP there are numerous different combinations of transmitter power and number of antenna bays that will achieve a specified effective radiated power. Larger antennas wind up costing more initially, but the long-term backcharge is less due to lower electricity consumption by the transmitter. While it may seem like a good idea to go with a large antenna in order to reduce the transmitter power, such a course of action can have detrimental consequences.

For instance, a 100kW station may wish to select a 12-bay full-wave antenna in order to keep the transmitter power around 11-12kW or so. As the number of bays increases on an antenna, the beamwidth in the vertical plane drops drastically. A 12-bay antenna will have a half-power beamwidth of a little more than 2 degrees with much of the vertical plane relative field below the beam at less than 0.2. The result is that if your site is close to your population center you may overshoot the desired area resulting in spotty coverage. On the other hand, if your site is roughly centered between several cities located 30-40 miles out, as is the case with one group in the plain states, then a large number of bays is perfectly acceptable since the local fauna most likely is not listening to your station.

Generally speaking most stations will choose to use an antenna with full-wave spacing between the bays. However, in certain instances, a half-wave antenna may be more desirable. A six-bay full-wave spaced antenna has a gain of roughly 3.3, which is similar to the 3.1 gain from a 10-bay half-wave assuming circular polarization on both. The half-power beamwidth of the main lobe in the vertical plane for the full-wave is around 4.2 degrees compared to roughly 5.2 degrees for the latter style antenna. This seemingly insignificant span of one degree can result in much better coverage over several miles of real estate. The drawback is that the half-wavelength spaced antenna will cost more due to a greater quantity of materials, and will result in additional tower loading.

Due to their radiation pattern in the vertical plane, however, half-wavelength spaced antennas are desirable in cases where non-ionizing radiation levels on the ground are a concern. In addition, some of the antenna manufacturers prefer half-wavelength spaced antennas for directional antennas as the pattern is controlled better than its counterpart with lambda spacing. Of course other spacings are permissible, and in some instances the use of 0.7 lambda spacing for a directional antenna may work better.

World Radio History

GOING DIRECTIONAL

There is no doubt that the FM band is becoming more and more crowded every day. The 2007 NCE filing window, for instance, saw the submission of some 3,600 applications. Although many wound up being dismissed for various reasons, the end result is a large number of new signals were added to the FM band, many of which were required to use a directional antenna. Some of the patterns submitted were downright strange, and quite frankly are not realizable with a run-of-the-mill side-mounted antenna.

In such cases it may be necessary to consider other designs such as panel or Yagi arrays. Panel arrays, because of their size, can add substantial loading to a tower by their sheer size and surface area. Yagi arrays on the other hand, may not cause as much loading to a structure, but can be more delicate in their construction, and suffer more from icing.

In some community antenna situations, the use of typical side mounted antennas is not practical due to the amount of available vertical real estate. In those cases more exotic solutions have been implemented. For instance, in St. Louis the community site there uses a combined antenna system consisting of a panel array with several layers. In this case, several stations have individual modules on a combiner spline feeding a single antenna. A drawback to this type of scheme is that an issue with the antenna or combiner will affect numerous stations in the market simultaneously. By contrast Willis Tower in Chicago accommodates numerous FM stations through a stack of cavity-backed resonators. Under this scenario each station has its own antenna, thus a failure does not have a widespread effect.

As previously mentioned, half-wave spaced antennas typically have lower downward radiation resulting in a lower power density at ground level. The ring-stub type antenna tends to have the greatest downward radiation component, and will have the greatest chance of exceeding the exposure standards. The Commission uses this design as a benchmark in their RFR analyses. If a proposed site passes the exposure criteria with this style, then there typically will not be a condition on the construction permit requiring measurements at the site. The double-V and roto-tiller style antennas have lower downward radiation, and specifying one of these designs may allow you to skate by the measurements.

In the end, the antenna can be one of the most costly components in the system to replace. Not only do the base material costs have to be considered, but factoring in the costs for a tower crew must be considered as well. It is not unusual for quality antennas, if well maintained, to last 30 years or more. True some of these antennas tend to be more expensive, but attempted cost savings by doing it on the cheap has a way of coming back to nip you when least expected.

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

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Market Mod Modifications

by Lee Petro

Like a mechanic constantly fine-tuning the engine of his hot-rod, the FCC issued an order make further modifications to its rules relating to community of license changes for radio stations. After opening the floodgates to modifications in 2006, the FCC has steadily applied the brake in recent years to ensure that rural areas retain local radio service.

Most recently, the Commission adopted rules in 2011 to prevent stations from attempting to serve an urbanized area by first filing for a community on the outskirts, obtaining priority as a first local service proposal, and then subsequently filing a minor change application to move the transmitter site to a location that would serve both the urbanized area, and the originally proposed community of license. The Commission stated that proposals which could subsequently be moved via a minor modification application to a new tower site that would serve the entire urbanized area would have to overcome the presumption in the original proposal that the proponent's intent was to serve the entire urbanized area. The FCC called this the Urbanized Area Service Presumption (UASP). If the UASP was not overcome by the proponent, the proposal was not eligible for the first local service preference under the Commission's allocation priorities.

Several parties sought reconsideration of the UASP, and several others sought clarification relating to the application of the UASP to pending proposals. Since the UASP involves a close scrutiny on the technical parameters of the proposal to divine the intent of the proponent, many of the requests for clarification/reconsideration dealt with the calculation and accounting for other stations in the surround areas. In response, the Commission tweaked its processing procedures in four notable ways:

> The Commission will now use the actual transmitter coordinates of an FM station proposing to change its community of license when calculating its gain and loss areas. Previously, the Commission used the allotment coordinates, which often times did not reflect the reality of the change in community, nor did it comport with the procedures for AM stations.

> The Commission will also require proponents to use their authorized and proposed power and height above average terrain when calculating gain and loss areas. As part of this analysis, the Commission requires proponents to use the standard prediction methodology to consider the surrounding terrain, but will not be permitted to use supplemental terrain showing or alternative contour prediction methods.

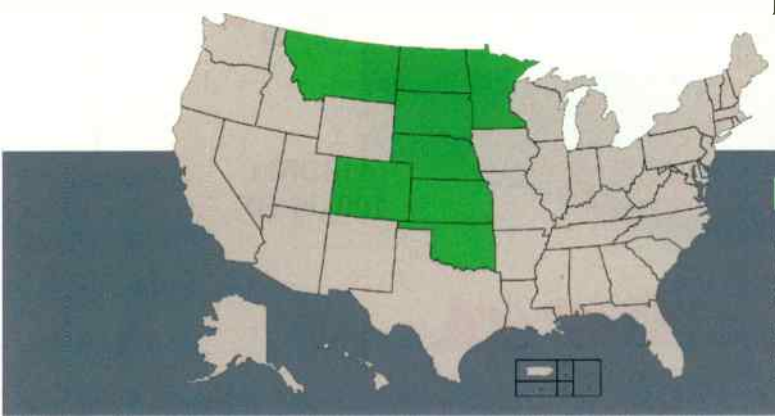
> The Commission also clarified that all full-service AM stations, including daytime AM stations, FM stations and NCE FM stations must be counted in a proponent's gain and loss study. In addition, proponents may rely on granted, but unbuilt, construction permits for new stations, but may not rely on vacant FM allotments for which a construction permit has not yet been granted.

> The Commission will not apply the UASP where a proponent seeks to move from community in an urbanized area to another community in that same urbanized area. However, the Commission will not permit the proponent to rely on a first local service allotment preference, but will examine only the proposed service area and population gains to determine if the proposal is in the public interest.

Finally, the Commission modified the application of the UASP on pending applications and allotment proceedings. Rather than apply them to all, non-final, decisions relating to non-hybrid proceedings as set forth in the 2011 Order, the Commission determined all minor change applications filed prior to April 20, 2009, which specified community of license changes, would be spared from the UASP. Also, all FM allotment proceedings for which the petition was filed prior to April 20, 2009, were exempt from complying with the UASP. Finally, the UASP procedures would not be applied to any decision which was released prior to March 3, 2011, the release date of the 2011 Order.

Only time will tell whether these changes will lead to an uptick in new proposals. While it is possible that the use of actual facilities when preparing gain and loss studies will open up new possibilities, it is unlikely that such changes will overwhelm the Commission.

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



DATELINE

Dec. 1: Stations in Colorado, Minnesota, Montana, North Dakota, and South Dakota file License Renewal Application and EEO Program Report, and noncommercial radio stations file Ownership Report (323-E). Commence running License Renewal Post-Filing Announcements, continuing on Dec. 16, Jan. 1 and 16. Stations in Kansas, Nebraska and Oklahoma commence running License Renewal Pre-Filing Announcements, continue running on Dec. 16, Jan. 1 and 16.

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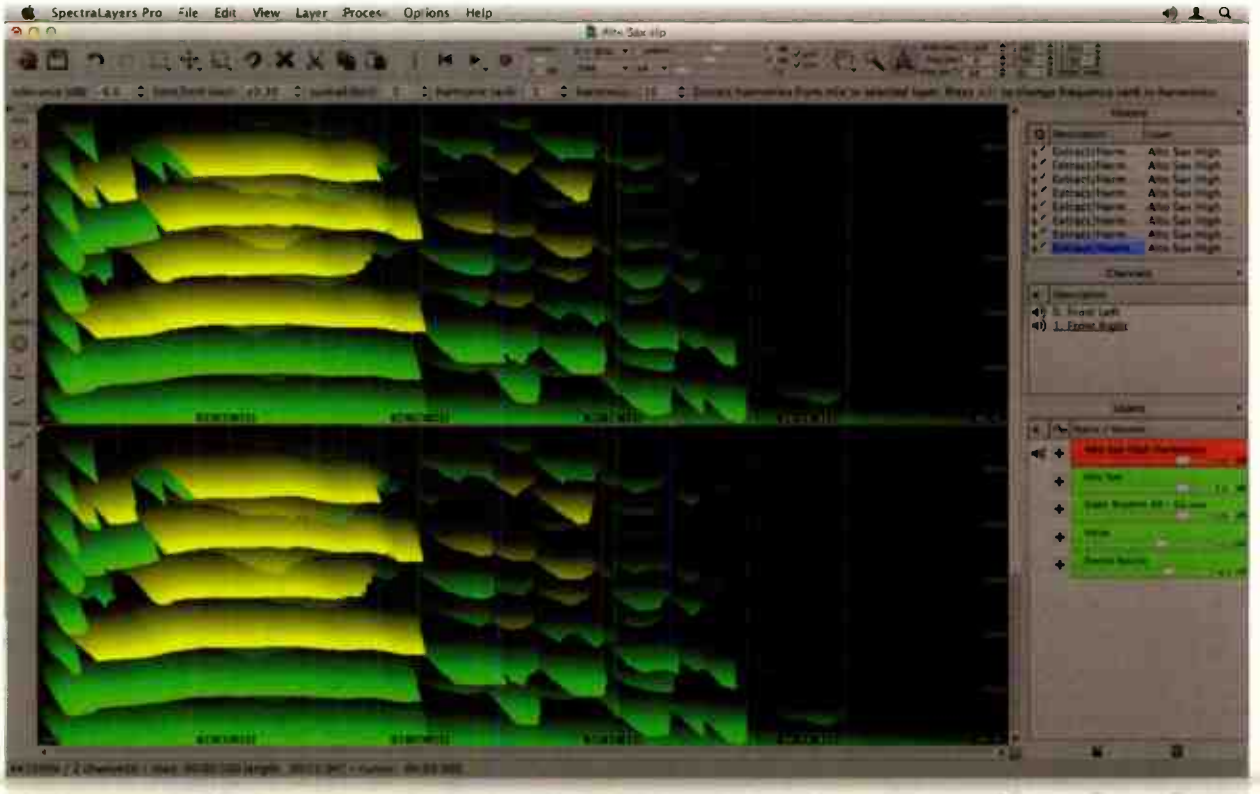

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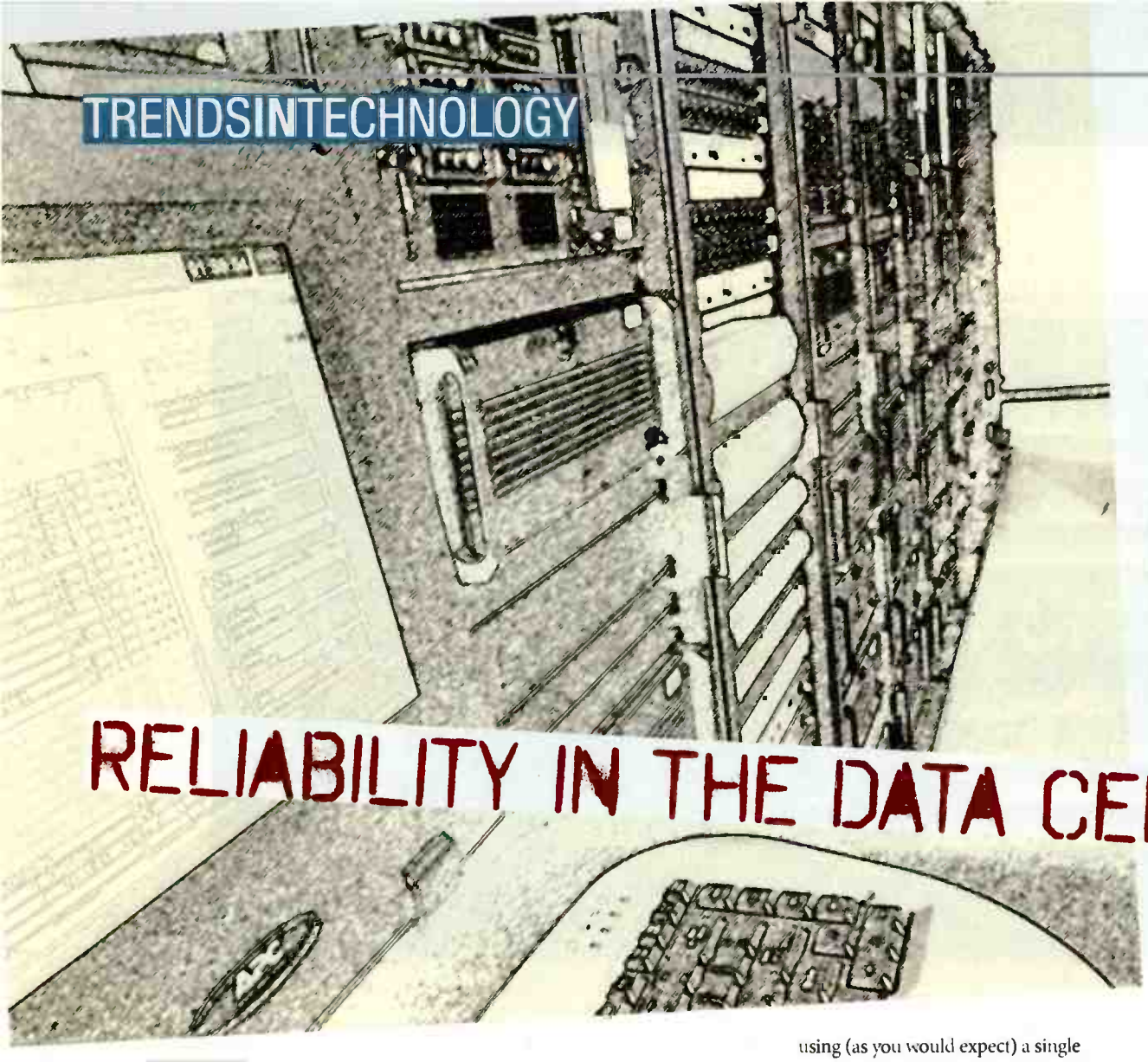

Keep the heart of the station beating strong

RELIABILITY IN THE DATA CENTER

By Doug Irwin, CPBE DRB AMD

Whether you call it a tech center, master control, or simply the rack room, one thing is for sure: Every radio station needs a central location at which all studio feeds converge, and from which all STLs leave. Like other aspects of broadcasting, the purposes of this central hub have changed over the years. In the old days this room was occupied by members of the engineering staff, but today this room likely holds computers workstations and servers, and probably a motley collection of devices that all require LAN connections. This, of course, is in addition to the items we still associate with radio, like audio routers, STL transmitters, audio processors, and the like. For our purposes, let's call this room the data center. That's a little more in line with where we're headed anyway.

When computers started to show up in radio station studios generally they were just shoved inside the furniture somewhere (or behind it) and a big CRT monitor was perched somewhere. A mouse and keyboard were put somewhere close. Of course as time went on, more computers showed up in the studio, with their inherent problems: fan noise, heat generation, and of course the space they use. A solution to these issues was to locate the computers remotely, and of course master control was the obvious location. The need for KVM (keyboard, video, mouse) extenders was obvious.

REMOTE CONTROL

Belkin, for example, makes the OmniView Cat-5 KVM extender that allows users to control their computer or KVM switch from up to 300' away using (as you would expect) a single Cat-5 cable. The computer end of the system has local KVM ports that allow for local access to the remoted machine as well.

Belkin OmniView Cat-5 KCM extender

Avocent Longview IP KVM

Avocent offers Longview IP KVM, which allows a user's computer to be placed anywhere in the LAN (presumably in the data center). In addition to supporting keyboard, monitor and mouse, it supports devices as well, and optionally, VGA, DVI-I, DVI and dual DVI video.

If you need to remote a Mac into the data center, you might consider the Gefen USB 2.0 extender USB 400. This is a four-port USB extender that used fiber optics to connect the two ends—and this particular one can go out 500 meters. This allows use of the mac keyboard, mouse and USB drives, which many producers insist upon. You'll still need to extend the monitor though by a different means. Another option is an all-in-one

Gefen USB 400

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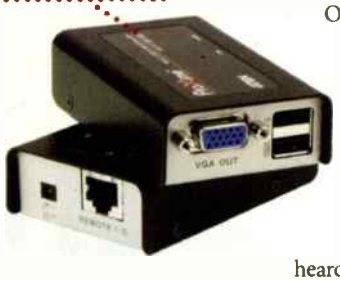
Aten CE100 Mini Cat-5 USB KVM extender



KVM extender that includes USB—such as the Aten CE100 Mini Cat-5 USB KVM extender.

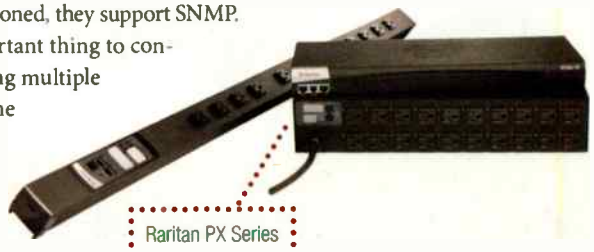
Of course there's an obvious problem with computers that are located in the data center—no one has access to them, right? It won't take long before you'll need to reboot one of them, during something other than normal business hours. An IP power-switch is called for in this case, and quite a few companies make these but one you've likely heard of is Broadcast Tools. Its product is the AC Power Sentinel 2 Plus. This is a two-outlet device, connected to your LAN, with a built-in Web browser that gives the ability to connect to it remotely from anywhere, and to control the ac power independently on its outputs. Use it to switch ac voltage up to 240Vac, but the total current (for both outputs) can't exceed 10A. It also comes with a couple of inputs that can be connected to external temperature and humidity sensors, and it has two status inputs that can be used for local control of the power outlets (i.e., your trusty remote control, if you happen to locate it at a transmitter site). The device also supports SNMP.

Broadcast Tools AC Power Sentinel 2

If two outlets aren't enough, then consider the Opengear IP Power 9258. This unit also allows remote access via a browser for independent control of four ac power outlets (maximum current per outlet is 6A; total current limit is 15A). This device also has a console port, so it can be controlled externally via a modem and telephone line—very handy if the remote device you need to boot is a DSL modem or perhaps a router or switch that has stopped and killed remote access to your LAN. The 9258 also supports SNMP.

Opengear IP Power 9258

Finally, if you need more than four outlets, you may want to consider the PX series of ac power controllers from Raritan. These not only allow control of the ac power outlets remotely, but it can also monitor the voltage and current on a per-outlet basis. The device can be configured to sequence the outlets if needed. There are many PX versions available, handling voltages from 100 up to 400Vac, and between 15 and 80A total (input current). These also have serial port access, and like the other devices mentioned, they support SNMP.



Raritan PX Series

The other important thing to consider is this—having multiple computers all in one location means you'll need a device that will allow you to look at each of them using the same keyboard, mouse and monitor—more commonly known as a KVM switch. You could give two users complete access to eight different computers by using a single Blackbox ServSelect III KVM Switch, for example. This particular device supports PS2 keyboards and mice, provides 1600 by 1280 resolution, and can be cascaded to increase the number of computers to be accessed.

Another well-known manufacturer of KVM devices is Avocent. The first device I'll mention is the AutoView Analog KVM. This device supports USB and/or PS2 mouse and keyboard. It connects to each machine by way of a small dongle (for lack of a better description) that hangs on the back of said machine, and then connects to the KVM switch via a Cat-5 cable (up to 100' away). And yes—you're thinking that (like the remote power switch) you'll want remote access via IP, right? In that case you would obtain the Digital KVM. That device has an onboard Web interface that

Blackbox ServSelect III KVM Switch

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ROC YOUR WORLD

The new ROC console from Logitek

When Logitek introduced its first ROC console back in the 1990s, it marked a revolution in audio console design. One of the industry's first router-based digital consoles, the original ROC boasted simple wiring and access to multiple sources at each fader.

Over the years, the router-plus-console Networked Audio concept has become the standard in console architecture. Although the original ROC was retired years ago, Logitek has continued to develop systems for both TDM and AoIP audio networking. The new ROC takes the best of the original design and pairs it with the latest technology and styling.

Available in multiples of 6 faders (up to 24), the ROC is housed in an attractive tabletop enclosure. Durable Penny & Giles faders, OLED source indication and intuitive controls make the ROC a natural for on-air, production rooms or even in temporary studio setups. Two monitor feeds, front panel headphone connection and user-assignable softkeys will please even your fussiest operators.

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allows two users remote access to any of the machines connected to the KVM switch. There's also a local-user port for access to the connected machines.

CLIMATE CONTROL

A room filled with computers obviously needs air conditioning. If you are in the process of building a new facility, you may not have all that much input on which units get chosen (aside from giving electrical consumption figures to your MEP engineer). However, due to the 24/7 nature of systems such as this, and your 24/7 need to know what is going on inside the data center, make sure you look at the BACnet and SNMP capabilities of any A/C units that are specified. BACnet is a communications protocol that allows devices such as A/C units to talk directly with BMS systems, and many manufacturers support it; take a look at this Web page for more specifics: bacnet.org/Gallery/index.html. Liebert, Trane, and Carrier are three well-known manufacturers on that list.

SNMP is the communications protocol that will allow you to keep track of what is going on via an SNMP manager. Just because a manufacturer supports BACnet doesn't mean that there is SNMP support. The way to find out is to take the specified manufacturer, then the model number of the LAN interface card that fits in it. Check its specifications then. All is not lost though if there is no support for SNMP; several companies make BACnet-to-SNMP converters. Control Solutions is one. Another is Chipkin.

POWER CONTROL

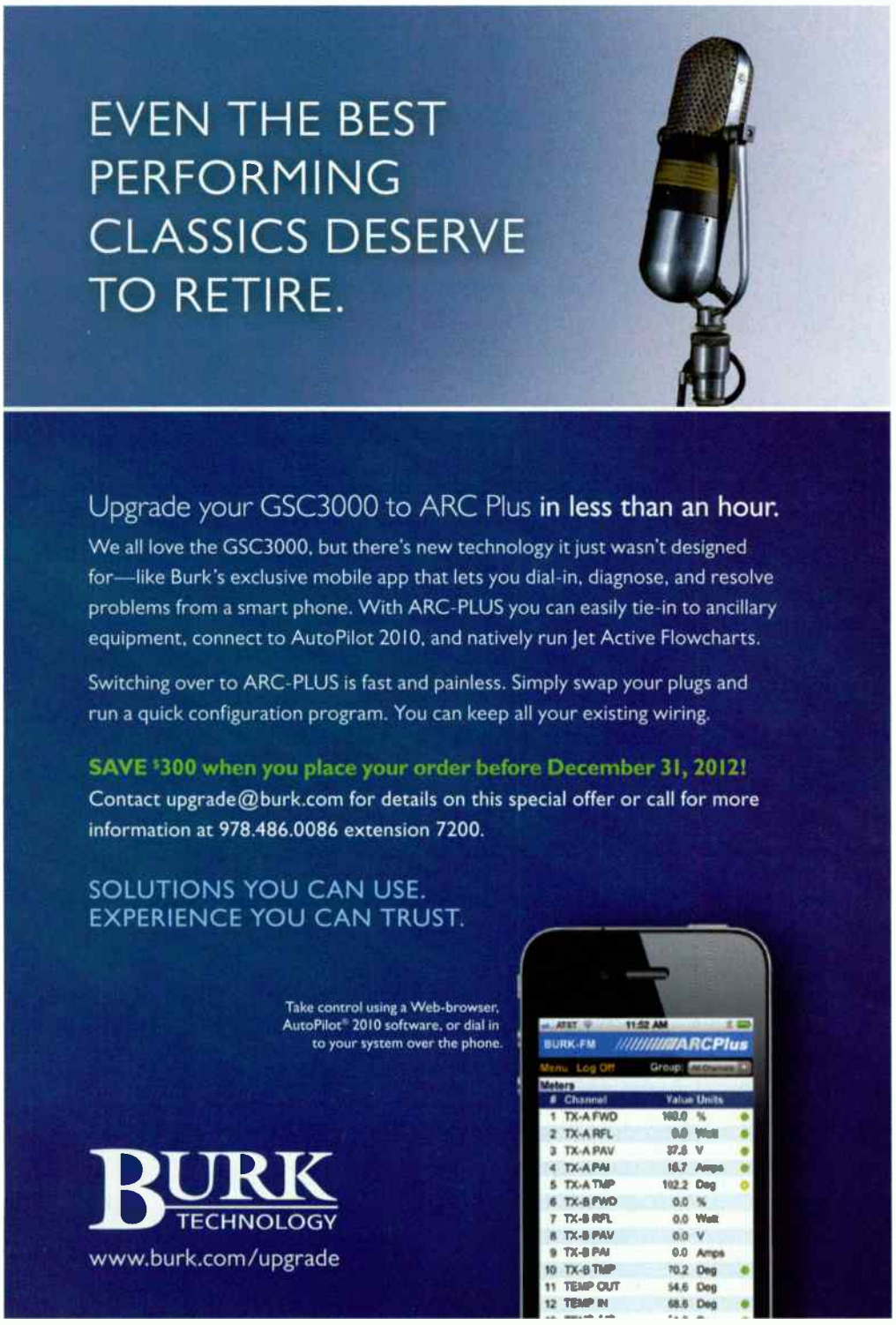
Alternate power sources are also very important for the 24/7 operation of a data center. There are two types of power outages to be concerned with. First, the inevitable "momentary" that is just long enough to let power supplies sag—but not long enough to bring on the emergency power. And, of course, those that are. The first is handled by a UPS—and the second by an emergency power source. Let's talk about both of these.

UPSs have become important since more and more computers have shown up at the radio station because, as we all know, they don't like momentary power hits. There are a couple of considerations aside from the power handling capability:

> Will there be a UPS per rack, or a large one that is the source for all racks?

> Battery powered (the usual choice) or perhaps flywheel powered?

If you opt for a single, large UPS then, again, you'll be providing information to your MEP engineer about the load size (which pretty much is what it is, right?) and the length of time you want to be able to hold everything up—in other words, how long the UPS can power the data center on its own. Clearly this is a budget issue—not only in the cost to acquire the unit, but to install it, and to maintain it. Large capacity means lots of batteries and higher maintenance costs down the road. And don't forget to build-in extra capacity. We all know more computers get added as time goes on.



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From Left to Right: LSR4326P LSR6328P, LSR2325P, MSC1 Monitor System Controller

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The other choice—putting rack-mount UPSs in where they are necessary—has its advantages and disadvantages as well. The primary advantage is expense. You buy and install a rack-mount UPS as needed. With one large UPS you focus your maintenance attention on it, of course—but with smaller unit scattered about, you'll need to keep track of every individual unit. To me that is a disadvantage. As far as battery expense goes—it's going to depend upon the size and number of batteries in a large UPS—which will all get changed at once—versus the cost dozens and dozens of smaller lead-acid cells.

You will find your job of maintaining UPSs is much easier if you always buy the network interface adaptor that comes with the unit. This will give you browser access—so you can see what is going on from anywhere—or perhaps even SNMP support, so that you can monitor the health of all the various units on a 24/7 basis. There are many manufacturers from which to choose when it comes to UPSs: Emerson (Liebert), APC, Toshiba, and Mitsubishi are some of the better known ones. For (relatively) small UPSs I'd like to bring one more brand to your attention—Falcon Electric. They specialize in double-conversion types—in other words, ac to dc, then back to internal ac sine-wave generation. This type of online UPS eliminates power line transients very effectively—especially compared to a unit that passes the ac through—only switching to battery power as necessary.

Another option for UPSs is the flywheel type. In this device, energy is stored in the rotating flywheel, as opposed to batteries. The obvious advantage here is that there are no batteries to replace as time goes on. The obvious disadvantage is that there is usually a limited amount of time this type can maintain the load. This type really only covers you while your emergency source gets ready to go. And just because there are no batteries doesn't mean there is no maintenance cost—for example, in the flywheel type, you will need to change the bearings after a certain number of hours. That's not an inexpensive proposition. Some well-known manufacturers of this type are Active Power and Caterpillar.

An emergency power source is a requirement for any data center that intends to maintain 24/7/365 operations. The obvious choice for that is a generator set. Again, if you're building a new facility, you'll tell your MEP

RESOURCE GUIDE

Active Power
activepower.com

APC
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engineer about the load requirements. Sizing of the set isn't the only thing to consider, though—fuel source is another, as are fuel storage and availability. There are many factors to consider when it comes to selecting the fuel source. Here is a simple Web page that has all the advantages and disadvantages conveniently laid out for you: generatorjoe.net/html/genfuel.html. Propane and natural gas are alternatives to diesel.

Of course you'll want to have remote access to your generator set. Cummins, for example, has a feature called PowerCommand iWatch. This browser-based monitoring system allows you to supervise and control generators (and transfer switches) from anywhere. In addition to Web access it provides alarm notifications, real-time data collection, data retention, and report generation.

Kohler is another well-known manufacturer of generator sets. Its remote access is provided by way of the generator controller system called Decision Maker. A PC runs software (called Monitor III) that communicates with the controller, and this connection can be done serially (or dial-up modem) or via a LAN connection through a Modbus/Ethernet converter.

RESOURCE GUIDE

Chipkin
chipkin.com

Control Software
csimn.com

Cummins
cummins.com

Emerson/Liebert
emersonnetworkpower.com

Falcon Electric
falconups.com

Gefen
gefen.com

Kohler
kohlerpower.com

Mistubishi
meppi.com

Opengear
opengear.com

Raritan
raritan.com

Toshiba
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Trane
trane.com

Caterpillar has a product known as ECMP for monitoring and control of their generator sets, and they also provide ECMP remote monitoring software that will run on a PC that talks with the control panel via a 10baseT Ethernet connection. Like the Kohler system, you would have to remotely access the computer that runs the vendor-specific software.

Alternatives to generator sets are few; one is the fuel cell. Most of the fuel cells out there top out at 5kW of production—probably of little use for a data center. On the other hand, there is. Bloom Energy. Bloom is producing solid-oxide fuel cell (the ES5400) for the 100kW level (480V/3-phase). Fuel sources are either natural gas or directed biogas. Bloom remotely manages the device, by the way; they give you access to a website that shows its performance.

Radio stations have changed much over the years—and so have data center (or master control room) requirements. It takes an amazing amount of resources to maintain large groups of computers.

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

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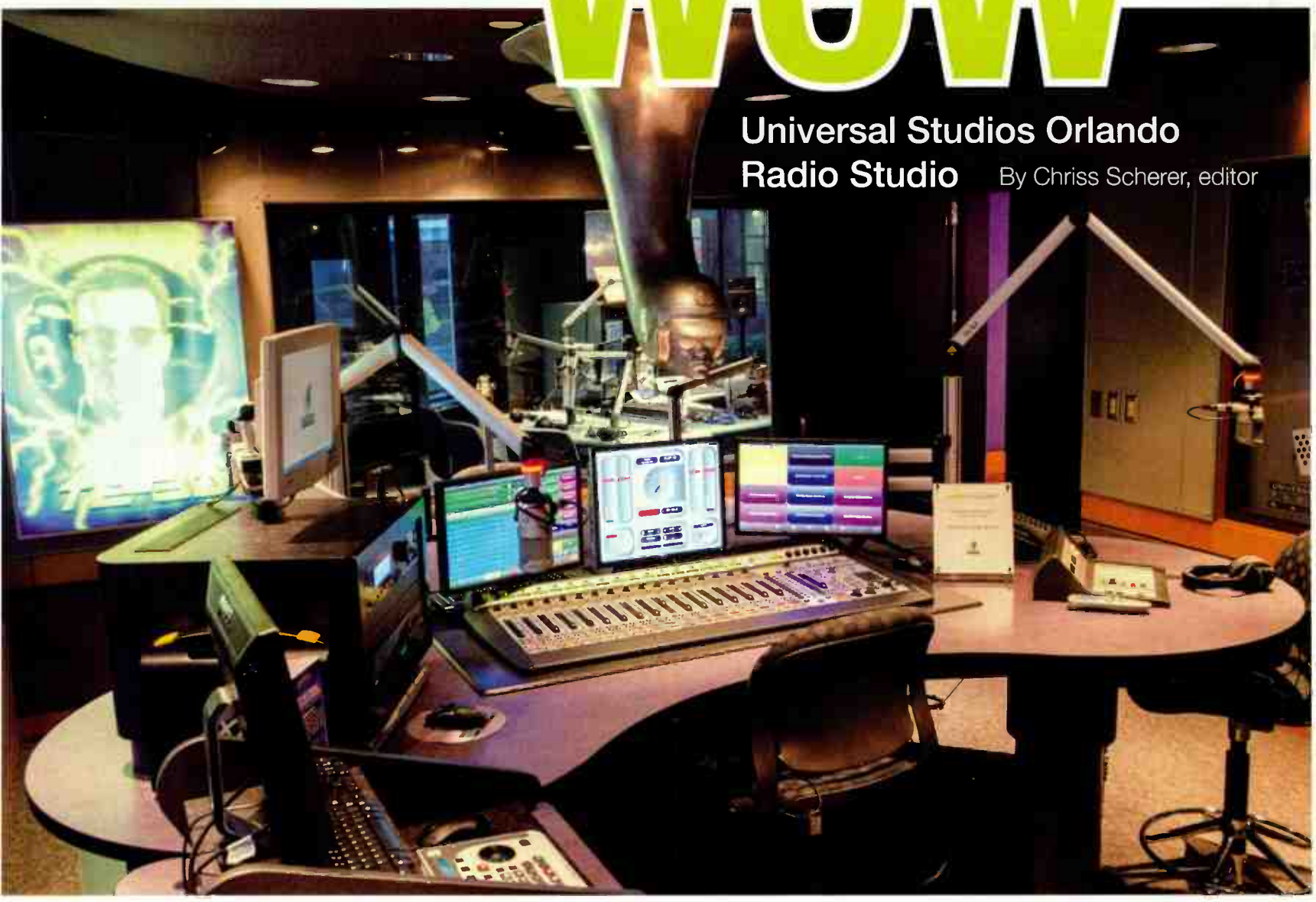
All About the WOW

Universal Studios Orlando Radio Studio

By Chriss Scherer, editor



When you visit a theme park, you want to be wowed. The rides and attractions are all designed to not only entertain you, but overstimulate your senses with motion, color and sound. For Universal Studios Orlando, this attention to the wow factor is apparent everywhere you go. Every experience at the park is intended to go beyond the visitor's expectations. While the latest addition to the park is the Wizarding World of Harry Potter, even established items are regularly updated. This includes the radio studios at the park.

Radio magazine has profiled the radio studios twice before in an online feature in 1998 and in the August 2002 issue. The last major update was in 2002, but there have been ongoing updates over the years. For example, the studio once had Mini-disc and DAT machines, which were popular formats at the time. As technology advanced, the studios saw incremental updates as well. After 10 years, it was time to update the consoles and routing system. The existing consoles worked just fine, but to keep pace with the effort of wowing the 250+ visiting radio stations each year, the plan was made to update the centerpiece of the studios.

VARIATIONS ON A THEME

There are two studios in the facility. The larger studio has a T-2 (Terminator) theme and the smaller studio has a Jaws theme. This includes a moveable T-2 head coming down from the ceiling and a swimmer being pursued by a shark. And while the park no longer has a Jaws attraction, the movie is still a well known classic.

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A Corian collar was added to accommodate the smaller consoles. T-2 is still looking at you.

The studio furniture, while 10 years old, has held up well and still looks good. There was no need to replace it. It's Harris Hydraflex and can be adjusted from 30" to 38" in height. This allows visiting talent to find their comfortable height.

Over the last year or so, the engineers replaced the mics and mic arms. Neumann BCM 104 mics were mounted on Yellowtec Mika booms. The Mika arms include the lighted ring to show the mic is live. Again, this fits with the intent to wow visitors.

To update the consoles, Bob Page of the Universal Studios Radio Broadcast Center, called on Broadcasters General Store, who called in Axia. The new system would include two Axia Element console surfaces with PowerStation cores and some Axia Nodes. The first step was to be prepared for the new consoles. The Elements are smaller than the previous consoles, so the in-counter hole needed to be covered. The mechanical shop at Universal stepped in and fabricated several collars (as they are now called) made of Corian to cover the openings for the consoles and

PARTIAL EQUIPMENT LIST

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Axia Element, PowerStation, Nodes
Broadcasters General Store
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Comrex Access, Bric
Harris Hydraflex
Neumann BCM 104
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extended time outside in the hot Florida sun is seldom preferred over and air-conditioned studio with a catered green room, the Comrex Bric and Access allow for remote feeds anywhere on the park property. An aircard gives complete portability as needed. Some events are held in the Hard Rock Hotel, and audio is shipped back via the Bric.

The radio studios at Universal Studios Orlando continue to provide visiting radio stations with top-notch studio facilities that provide an experience beyond expectations. The most recent upgrade maintains the showcase look and feel that wows both park visitors and stations.

Photos by Jim Kuzman of the Telos Alliance.

THE TECH TEAM

Bob Page
Jeff McGinley
Jim Kuzman
Buck Waters
Jim Armstrong
and local Orlando engineers

the headphone and mic control panels for the guests. The Corian color accents the existing furniture.

QUICK TURNAROUND

The entire console swap was completed over a long weekend. On a Friday afternoon, Bob Page was joined by Jim Armstrong and Jim Kuzman of Axia and the Telos Alliance, Buck Waters from BGS, and some local Orlando engineers got to work pulling the old consoles out. The previous consoles had all discrete wiring, so that was removed as well. Then the collars were installed.

Once the old wiring was removed, a new CAT-5 cable was run between each studio and the rack room. This simplified installation and made it possible to complete the project over the weekend.

The old mic processors had been removed earlier, but they were not replaced because the Axia has built-in processing on board.

On Monday, Jeff McGinley came in to help tie down some loose ends and have the studio ready for use on Tuesday. The new studios were first used on Sept. 6, 2012.

Another addition was the BSI Op-X automation system. While it's not expected a visiting station will run a full show from the studio with music from a playlist, it is possible. The Op-X replaced a cartwall audio player, and in doing so provides greater flexibility to visiting stations.

OUTSIDE CONNECTIONS

When stations visit the park, most of them use ISDN to connect back to their home stations. A few have used a POTS codec, and a few have used an IP codec.

But visiting stations are not confined to the studios. While spending

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Reception Issues Resolved

by Doug Irwin
CPBE AMD

Primarily, my job as transmission systems supervisor for Clear Channel in New York is to keep all of our radio stations on the air no matter what. However, as the RF guy, I'm also tasked with all reception issues at our studio HQ downtown; this includes everything from off-air signals to CATV around the facility. Many of us in this business are hams and as such know a little something about transmitters; what is also true, though, is we learn a lot about reception and how to optimize signals going in to a receiver. Let's take a look at a couple of common reception issues.

First, let's say you have an antenna on the roof pointing at the transmitter site, ultimately driving a mod monitor or perhaps an in-house cable system that feeds offices (like the PD's office) and others around your facility. One day your company adds another radio station to the mix, but the trouble is that its transmitter site is way off; one antenna cannot be used for mod monitors for both stations because while it works great for one transmitter site, it's horrible for the other. How can you get around this?

The obvious thing to do is to put up yet another antenna on the roof, and to bring a coax down from it to your technical center. But how do you make it show up on the same cable system already running around? You can't tell your PD to swap cables on the back of his or her receiver when changing stations, right?

Figure 1

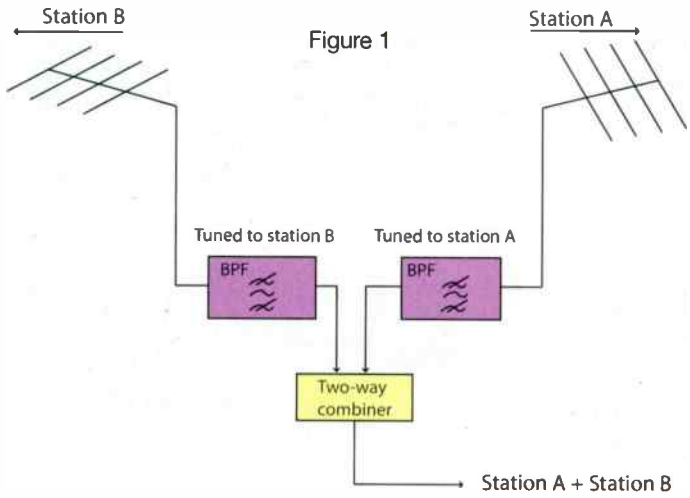
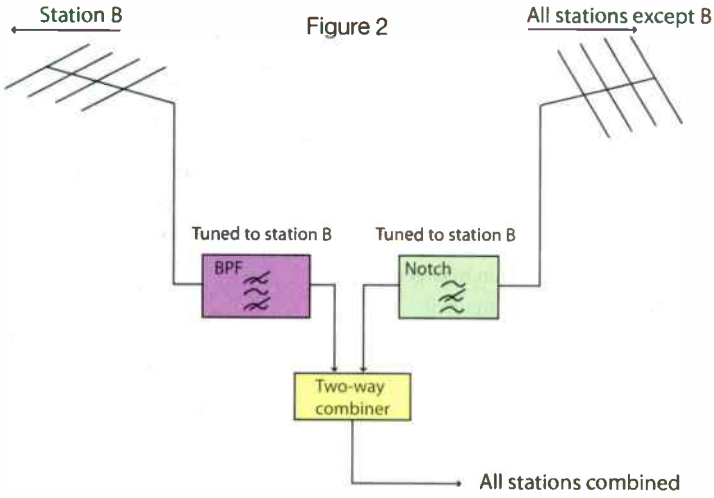


Figure 2



You can add the signals from two different antennas by using the appropriate filters and an inexpensive splitter/combiner. Station A comes in from antenna A and station B (the new one) comes in from your new antenna B.

While it's tempting to just combine the two with the splitter/combiner, most likely you'll be making a horrible mess as far as the receivers are concerned—terrible multipath noted on the cable because of two sources of the same RF. The key to making this work is to manage which signals get into the combiner. The most simple situation is one in which you have a single station on antenna A, and one on antenna B (Figure 1). In that case an easy way would be to just install a bandpass filter on antenna A to pass station A, and another bandpass filter on antenna B that passes only station B. You can combine the two outputs then to drive your in-house system, since each station is now represented by only one source.

Another scenario can be seen in Figure 2. Here, we have multiple stations coming down in from antenna A (because most of the stations transmit from that site), and just one station coming in from antenna B. Let's say on antenna A, you need to cover all of 88.1 to 107.9, but on antenna B you need 99.5 only (just as an example of course). In this case, you would install a notch filter for 99.5 in antenna A, and the bandpass filter in antenna B. You can successfully combine those two outputs in to one feed then.

These kinds of filters are available from Microwave Filter Corporation. (microwavefilter.com)

Next month, more tricks of the trade with respect to combiners.

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

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The ARC-10UP with unbalanced inputs and PC sound card is displayed. The ARC-10U has unbalanced inputs without a sound card. The ARC-10BP has balanced inputs with the PC USB sound card

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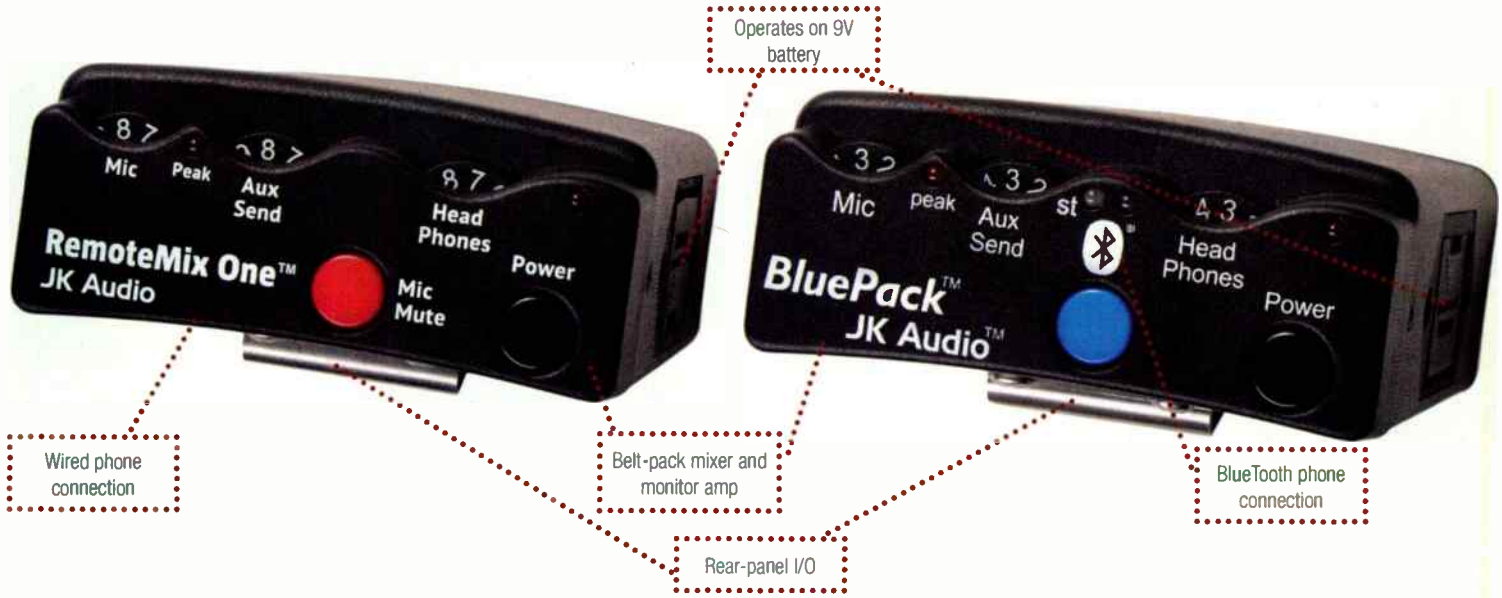

JK Audio RemoteMix One, BluePack

by Kirk Chestnut, CPBE

Smart phones have become the de facto news gathering tool of choice. The RemoteMix One by JK Audio and its Bluetooth twin BluePack can mix and feed one microphone and one line level device to a cell phone in a compact, portable package. It creates a professional "front-end" to a cell phone whether it is used for phone-ins or as an IP codec.

Connecting a professional microphone or "mult box" feed to that tiny 3.5 mm TRRS (tip-ring-ring-sleeve) cell phone connection can be challenging without a proper interface. What if a reporter wants to feed audio cuts in real time during a report? Lugging around a portable multi-channel mixer may be impractical. Need a wireless mic at a press conference that interfaces to your cell phone? These challenges and more are met with the RemoteMix One and BluePack.

These rugged, belt worn devices join an elite and innovative family of remote production tools including various Bluetooth enabled devices for transmitting and receiving audio via a cell phone. "On-the-Street" reporting demands an uber-simple interface so the correspondent has their head in the story, not the technology on their hip. There are only three user volume controls: "Mic," "Aux Send" and "Head Phone" with only two switches for "Power" and "Mic Mute." The BluePack exchanges the "Mute" for a Bluetooth pairing "Multi Function Button."

JK AUDIO
800-552-8346
jkaudio.com
info@jkaudio.com

THE INPUTS AND OUTPUTS

The XLR jack is a "mic" level input and works with any standard dynamic microphone. It does not provide phantom power. A playback source can be fed through the "Aux In" 3.5 mm jack and controlled with the corresponding front panel control. This mix is sent to the phone via a 1/4" "Headset Interface" jack.

The 1/4" headphone jack provides a very adequate 0.5W per channel mix of the microphone, auxiliary source and return audio from the remote end. For recording purposes, a stereo 3.5 mm jack outputs the local "mic" feed on left channel and return audio on the right. The reason for this arrangement, according to JK Audio's Joe Klinger: "Most recorders loop the input (record) audio directly to the output jacks for real-time monitoring. We went out of our way to ensure that [the] 3.5 mm output does not get looped back into the input, to avoid an echo or feedback loop. You can still hear the full mix on the headphone jack."

POPULAR INTERFACE

Incorporated Bluetooth technology in the BluePack allows the user freedom of movement without a cable between the interface and phone. This freedom comes at a price however, Bluetooth technology is purposely limited in audio bandwidth (300-3400 Hz) since the additional audio information would be lost on a standard phone connection. Klinger also tells me a new Bluetooth standard called HD Voice is coming soon. It will support 50-7000 Hz bandwidth with lower noise and improved dynamic range. The RemoteMix One wired connection, however, retains the full 20k audio range.

The advent of IP codecs has changed the remote production landscape. Now, full bandwidth audio can be transmitted back to the station via the cell phone network using 3G, 4G and WiFi enabled phones. The

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RemoteMix One is a cost effective alternative to the stand alone IP interface.

OUT OF THE BOX

Simple to set up and operate, the RemoteMix One needs very little preparation. Install a single 9V battery, hook up the headset cable to the cell phone audio jack, plug in the mic and you're ready to broadcast. Though anecdotal, the power consumption during testing was minimal. The manufacturer boasts run times in excess of 10 hours on the BluePack (20 hours on the RemoteMix One) with a single battery.

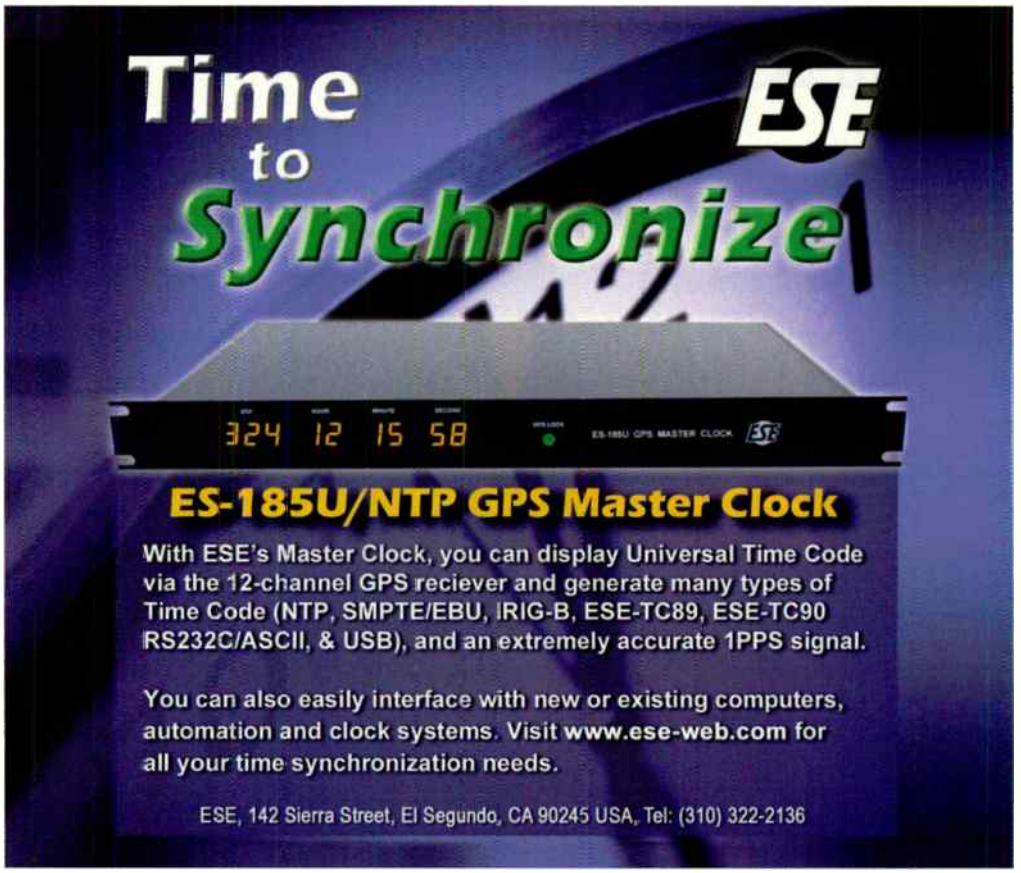
Using the BluePack requires the process of "pairing" to a Bluetooth enabled phone. Pairing begins by pressing and holding the Multi Function Button (MFB) for 5 seconds. The pairing request should appear on any Bluetooth enabled phone within range. Once bonded, future connections will take less time as the phone data is stored in memory. Up to 16 devices are held in the memory. Pressing and holding the MFB for 20 seconds clears that history.

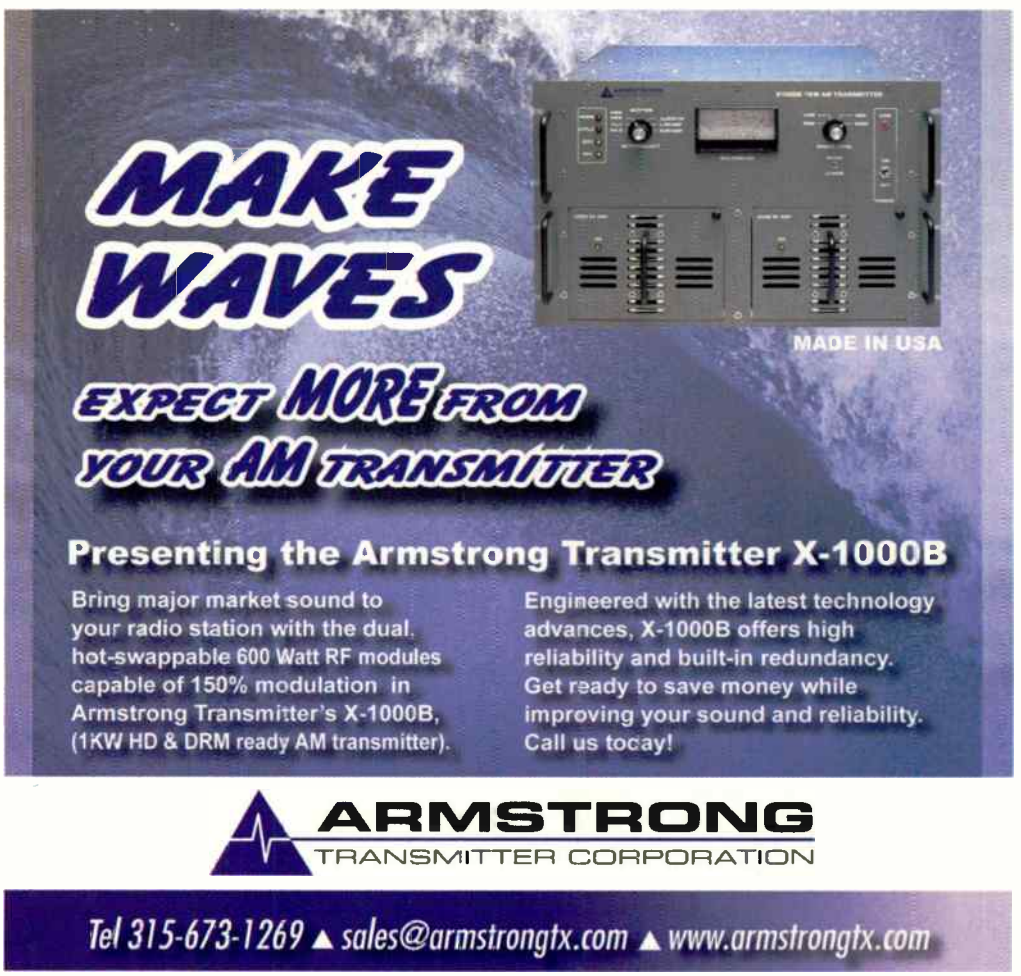
Tests were conducted in conjunction with an iPhone, iPad and multiple phones on the Android platform. No configuration or modification to the phone is necessary using the RemoteMix One. The phones used during the test immediately recognized and configured themselves for headset operation.

A popular smart phone IP codec was chosen to test the full bandwidth capability of both the RemoteMix One and the BluePack. iPhone/iPad performance was flawless with both interfaces. Tests using a Samsung/Android and HTC/Android also yielded very satisfactory results. Only in one case was there a problem with distorted audio when using the BluePack with the IP codec. It turns out the HTC Model PC36100 running Android version 2.3.5 had a difficult time translating the Bluetooth audio to the IP codec. There were other problems encountered with the same phone model such as distorted audio when placing phone calls after using the IP codec. It was isolated to this particular phone/OS/IP codec combination. No other phone tested had these issues.

Whether it was coverage of Fan Fest at the World Series, "drop ins" with a morning show host or on-the-street interviews, the RemoteMix One and BluePack met or exceeded expectation.

Chestnut is assistant chief engineer, Entercom Communications, Kansas City.





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AKG HSC 271, HSD 271

by Chris Wygal, CBRE

Microphones are the most noticeable and iconic trademarks of sports and newscasters. In the case of sportscasters, they almost always use headsets, which offer hands-free miking and isolated monitoring. Countless environmental and technical factors are taken into account when choosing the right headset; the primary one being the format on which the sporting event is carried. In an age when radio broadcasts are sent less and less via POTS lines, microphone quality and performance is a bigger concern. Full-bandwidth audio is easier than ever to get from stadium to studio. The talent microphone offers the first impression listeners will hear concerning the content being broadcast. With that in mind, AKG has unleashed the HSD 271 and HSC 271 headsets, both of which deliver superior reproduction and tout some pretty neat features to boot.

TRY ONE ON FOR SIZE

The primary difference between both models of headsets is what lies in the microphone capsule. The HSD model has a dynamic element, and the HSC a condenser element. The two headsets are identical in design, weighing only 8.8 ounces and offering a very comfortable headband and circumaural earphones. This means the ear muffs completely encapsulate the ear. They are also closed back, rejecting a good amount of background noise. Both headsets ship with vinyl and velour (cloth) earpads, which are easily interchangeable.

The HSD 271 and HSC 271 headsets do not ship with connection leads, but several different cable sets are available from AKG and should be specified when ordering the headsets. Various talent box, mixer and headphone amplifier setups dictate different connection lead cable sets which can range from four- and five-pin XLR plugs, three-pin XLR and 1/4" TRS combinations, and 3.5mm minijacks for direct use with computers. The headset itself (both models) has a 6-pin mini XLR socket located on the left ear under the microphone arm.

TECHNICALLY SPEAKING

The microphone arm is mounted on the left ear on both models. It swivels 270 degrees to accommodate having the microphone on the talent's left or right side. This is especially important in situations where announcers work in tight quarters close to one another. For example, if an announcer has a partner to his right, his microphone should be on his right, pointing away from his partner. The compliment is true for the other announcer. This configuration helps avoid comb filtering. The 270-degree swivel feature allows for quick setup changes. The microphone arm itself is sturdy and flexible and contours nicely. The microphone capsule is extra flexible, and shock-mounted to avoid handling noise. When an announcer flips his microphone up above his head to talk off air or cough, both the HSC and HSD microphones quietly turn off. This feature prevents unwanted speech and handling noise from making it on the air. A headband switch also mutes the mic when taken off.

Both condenser and dynamic models boast 16Hz to 28kHz response, the condenser model exhibiting a more flat response at 15kHz, while the dynamic model exhibits a sharp 10dB notch at 15kHz (frequency response at 30mm from source). Both microphones are cardioid and respond very accurately, handling high SPLs and producing a very low and unnoticeable noise floor. By way of contrast, the HSC 271 condenser model is considerably more sensitive, providing much more output than its dynamic counterpart. The more natural curve at 15kHz produces a brighter and slightly more life-like response. An important consideration for the

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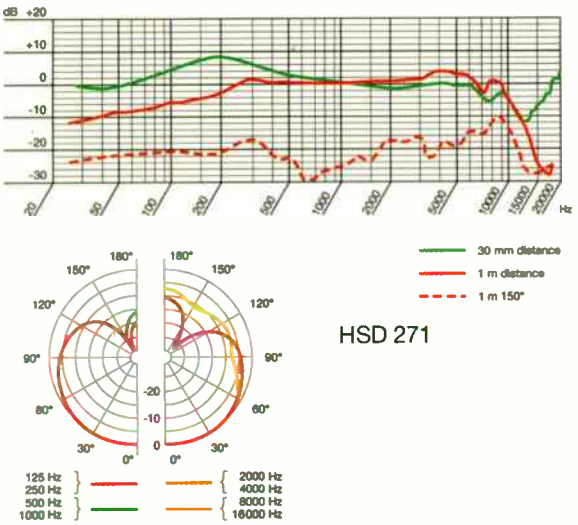
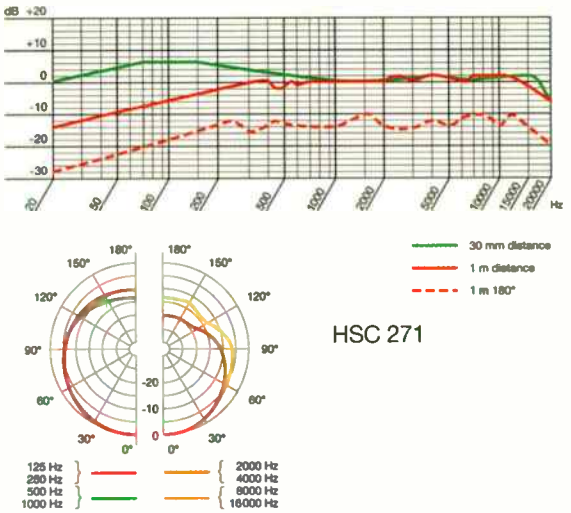


HSD 271



HSC 271

HSC 271 is the HSC-PA phantom power adapter that is necessary for its cable set. The HSC-PA is housed in an extended XLR connector and has a small printed circuit board inside. A user-configurable set of jumpers is where the bass cut filter can be activated, and the microphone on/off feature can be deactivated.

From comfort and ergonomics to monitoring and microphone reproduction, the HSC 271 and HSD 271 are fantastic solutions. The lightweight design and adjustable microphone arm will keep announcers happy. In addition, the circumaural earphone design allows for accurate monitoring and the added microphone on/off feature offer extra confidence that unwanted noises and speech will remain unheard by listeners. Special features such as bass cut filter and a life-like frequency response make an engineer's job much easier on gameday.

Wygal is the programmer and engineer for Victory FM at Liberty University, Lynchburg, VA.

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SIDEBYSIDE

Apps for Field Contribution

Sending audio from the field back to the studio has evolved from leased lines and RPUs to ISDN and now to IP. At the same time, the power of the handheld devices we carry has been put to good use in radio as well. There are many apps to record quality audio from the field. There are also hardware add-ons to improve the recording functions. But there's another use for that smartphone when you need to get audio back to the studio.

A typical telephone call is still the simplest method to deliver audio, and with so many people carrying phones, it's easy to connect from anywhere. But a standard phone call is limited in audio bandwidth, and is hardly comparable to the high-quality audio available through other means. Bad audio is bad radio.

So why not take advantage of the digital connection of the smartphone to deliver better audio via 3G, 4G or Wi-fi? That's what some apps now do.

Using Session Initiation Protocol (SIP), a handheld device app can communicate with another device, like an IP codec at the station. The app connects to the receiver's IP address. The EBU working group for Network Audio Contribution Over IP (N/ACIP) adopted SIP for codec interoperability and included it in the Tech 3326 standard. Devices can connect directly or through a proxy server.

The handheld apps provide a signal path with a higher bandwidth than a typical POTS telephone call. The ubiquitous G.722 encoding provides a 7kHz connection, and other encoding algorithms provide quality up to 15kHz.

Some apps can also record audio for later transmission, which adds to their flexibility.

Model	Luci Live	Media5 Fone Pro	Tieline - ReportIT Live Enterprise
License Type	single user	single user	up to 10 devices
Minimum Bit-rate	24Kb/s	not stated	14.4Kb/s
OS	iOS, Android	iOS, Android	iOS, Android
Minimum Coding Delay at 24kb/s	128ms-HE-AAC v.1	not stated	20ms-Tieline Music
Maximum Live Audio Quality @ 24kb/s	12kHz bidirectional	not stated	15kHz bidirectional
Maximum Recorded Audio Quality	20kHz	not stated	20kHz
Audio Sample Rate	44.1 to 384kHz	not stated	16, 22, 32, 44.1, 48kHz
Encoding	G.711, G.722, ULCC, MP2, AAC, AAC-HE, AAC-HEV2	G.711, Enhanced G.711, G.722, iLBC, iSAC, G.729	Tieline Music, AAC-LC, WAV
Connection Types	3G, 4G, Wi-fi	3G, Wi-fi	3G, 4G, Wi-fi
Transport Protocol	RTP, UDP	TCP, UDP	TCP/UDP
N/ACIP Compatible?	✓	✓	✓
Offline Recording	✓	no	✓
Recorded Playback	single recording	-	multiple recordings
On-board Editing	top and tail	-	top and tail
Audio Recording Formats	AAC-HE, MP2, WAV	-	WAV, AAC-LC
FTP recordings	✓	-	✓
Auto FTP on disconnect	-	-	✓
Integration with automation systems	-	-	✓
Notes	-	free edition available	single license available
MSRP	$400	$325	$399
URL	luci.eu	media5corp.com	tieline.com

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Our 3 runners-up were; Errol R. Coker (KHCB), Jason Ornellas (WDHA-FM) , Van Craft (KENI), who each received Amazon gift cards.

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NEWPRODUCTS

Roland | Recorder/mixer

R-88: The Roland R-88 extends professional portable recording by providing seamless integration of a recorder, mixer and a multi-channel audio interface. With eight channels of audio recording plus a stereo mix, the R-88 includes a full on-board mixer, various timecode modes and slate tone/mic for memos. The stereo mix output is for location sound recording applications enabling a stereo mix while simultaneously recording individual tracks. It also features professional AES/EBU digital I/O to digitally record from or send to a mixing console or other digital source. The R-88's built-in mixer is equipped with a three-band EQ. The large touchscreen display enables clear and intuitive device setup and control.
rolandus.com

TSL Professional Products | Audio and loudness meter

PAM PiCo: No bigger than a smartphone, PAM PiCo handles stereo or 5.1 metering with a vast array of user-selectable bar graphs, moving coil emulation and DK Technologies' StarFish surround sound displays for use in diverse audio monitoring applications. Built around proprietary hardware, it does not rely on a third party consumer electronics platform and is self-contained, requiring only power and media to function.
tsl.co.uk

Allen & Heath | Compact broadcast mixer

XB-10: The compact XB-10 is for small radio or Internet broadcast studios, college and university radio stations, podcasting, content creation and more. Radio-friendly tools include a telephone communication (telco) channel, mic channel on switch sensing, stereo channel start/cue outputs for CD deck transport control and automatic muting of speaker outputs. A separate monitor mix can be created for operator and guest or presenter, and the operator can speak off-air to the studio or telephone callers using the talk feature. XB-10's preamps use low-noise discrete transistor circuitry to achieve high gain and linearity. Each mic channel comes equipped with a CompACT compressor to keep the dynamic range of a presenter microphone under control. A variable limiter on the main output ensures that the final mix to air does not saturate expensive broadcast equipment. The plug-n-play USB connection can be used for VoIP telephone calls, recording program material, playing jingles and more.
allen-heath.com/US

MicW | Mini shotgun mic

iShotgun: iShotgun is a super cardioid mini shotgun microphone for Apple iOS, Android smartphones, tablets and DSLR cameras. It is an 8.5mm wide super cardioid electret condenser microphone, designed to be small, light and highly directional eliminating unwanted background noise during shooting. No additional batteries are required as the microphone obtains its power directly from the portable device. The iShotgun is supplied as a kit with a case, a windscreen, a mini boom-pole, an extension cable, one curly DSLR interface cable, one T headphone/mic splitter, one top headphone/mic splitter, and one hot shoe suspension mount for DSLR cameras.
mic-w.com

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Lowell Manufacturing Company | Surge suppressors

ACR-1509-S, ACR-1509-SD, ACS-1505-SW-SD: The ETL-listed ACR-1509-S and ACR-1509-SD are 1RU 19" EIA rackmount panels with a total of nine 15A outlets (three switched, six unswitched), front rocker switch, and nine-foot power cord with NEMA 5-15P plug. The ACR1509-S offers single-stage surge suppression, while the ACR-1509-SD offers dual-stage (redundant) protection. The ACS-1505-SW-SD is a low-profile, 15A rackmount power strip that measures only 2" by 2" by 12" yet includes five single outlets (all switched) with spacing for external power supplies plus the new dual-stage surge suppression. ETL Listed in the US and Canada, this power strip includes a 6' detachable power cord with molded plug and universal mounting brackets.

lowellmfg.com

Sony Creative Software | Music library

Production Music: Production Music consists of a unique selection of royalty-free music tracks for both personal and commercial use. The collection provides customers with immediate access to an extensive range of choices, featuring more than 1,600 tracks, each consisting of four different cuts: 10 seconds, 30 seconds, 60 seconds and full length. The catalog delivers music in a variety of genres including ambient/cinematic, country, electronic, jazz, news, pop, rock, urban and world.

sonycreativesoftware.com

The Padcaster | iPad stand for video

The Padcaster: The Padcaster transforms an iPad into an on-the-go production studio, providing an easy and professional way for users to create videos on the iPad, from storyboarding and shooting to editing and sharing. It features an aluminum frame with a urethane insert that snugly holds an iPad. Threaded holes lining the edges of the frame allow users to attach external mics, lights and countless other accessories to enhance the finished product. A standard 1/4-20 screw thread and locking-pin design centered on the bottom of the Padcaster lets users connect it to a professional tripod, monopod or shoulder mount for easy, smooth filming.

thepadcaster.com

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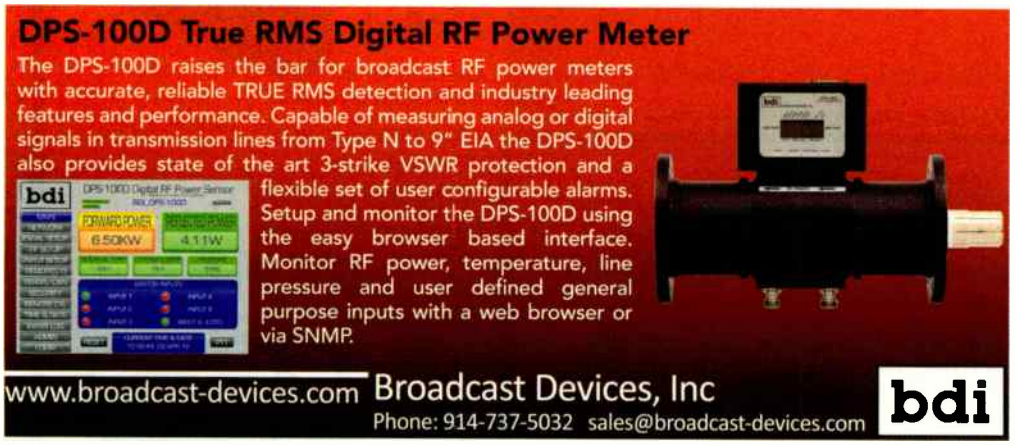
FastCap Manufacturing | Tool protection

Kaizen Foam: Securing equipment and tools protects them while being moved. When a custom-fit is needed, Kaizen Foam can provide the protection. The multiple layers can be cut to the needed depth. Foam is available in 7/8", 1 1/8" and 2 1/4" depths. It comes in black, white and black on white, which is white foam with one black layer. The dense, rigid foam can be cut with a utility knife, and the multiple layers allow the cut-out to be contoured. The layers are fused together but specially designed to pull apart fairly easily and consistently when cut.

fastcap.com



PMC Loudspeaker | Near-field monitors

twotwo: The active twotwo series combines PMC's design and Advanced Transmission Line (ATL) bass loading technology with digital signal processing. The result is a range of true reference tools designed for ultra-critical professional monitoring, in stereo or surround. The midnight blue range initially comprises two models, the twotwo.5 and twotwo.6. A third, the twotwo.8, will be added in 2013. All three share the same core design and features; the model number refers only to the approximate size (in inches) of the bass driver, with larger numbers denoting increasing cabinet volume, greater bass extension and higher SPLs. The range is designed and built in Britain using state-of-the-art technologies and components for clarity, transparency image stability and accuracy.

pmcloudspeaker.com

Belar | All-in-one FM modulation monitor

FMCS-1: The FMCS-1 provides a complete monitoring system for the analog portions of the FM signal. It combines the features and functions of an RF amplifier, FM demod, stereo demod, RDS decoder, two SCA decoders and FFT spectrum analyzer in one product. All the FMCS-1 processing takes place in the digital domain, this results in FM analog performance that was previously not possible. Features include frequency-agile RF input, AM and sync AM noise measurements, HD Radio RF carrier rejections filters, FM demodulation, variable bandwidth composite filtering, stereo demodulation with 100dB L/R separations, full metering of analog peak and RMS values, RDS injection/phase and full data decoding, two SCA decoders, RF, composite and audio FFT spectrum analysis and RJ-45 Ethernet interface with remote PC software. With the included RJ-45 Ethernet Interface and Belar WizWin Software, all of the unit's display screens, settings, and alarms may be accessed & controlled remotely.

belar.com

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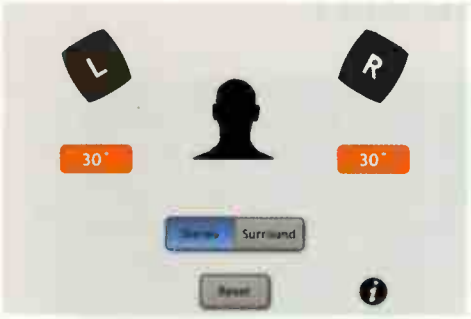

Genelec | iOS device app

SpeakerAngle: The SpeakerAngleapp for iOS devices allows anyone to correctly set and match the angling (toe-in) of both stereo and 7.1 surround sound speakers, helping to ensure optimum audio fidelity. Easy and intuitive to use, SpeakerAngle was co-developed by Genelec and AudioApps, and is compatible with iPhone 4 and later, iPad 2 and later and iPod Touch 4th Generation and later. Dedicated onscreen speaker icons move as the actual speaker is rotated, while number boxes below each speaker icon continuously display the angle of the speaker. The number boxes also change color to let users know when their speaker is angled within industry recommendations, and when it is angled to the same degree as the other one in the pair. Detailed information screens provide a tutorial on speaker angling, as well as step-by-step instructions for using SpeakerAngle.

genelecusa.com

UPGRADES AND UPDATES

Sony Creative Software has released Sound Forge Pro for the Mac. The software was designed from the ground up to operate on Mac OSX. (sonycreativesoftware.com)
Myers Information Systems has released ProTrack Broadcast Management Software version 6.06. The update provides new workflows to better manage day-of-air schedule opportunities, plus greater integration of schedules and sales across multiple distribution platforms. (myersinfosys.com) ■

FIND THE MIC WINNER
SEPTEMBER ISSUE

Congratulations to

Tom Holmes
of
Cumulus Media
Columbia, MO

He won a Hosa Technology HMIC-025 three-pack.

www.hosatech.com

The mic icon was on the side of the phone flasher.

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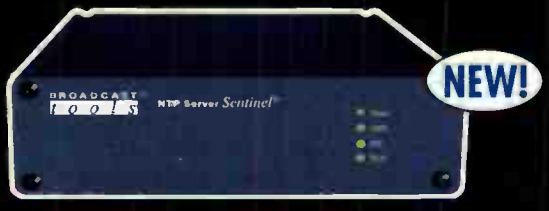

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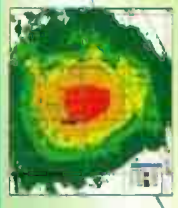

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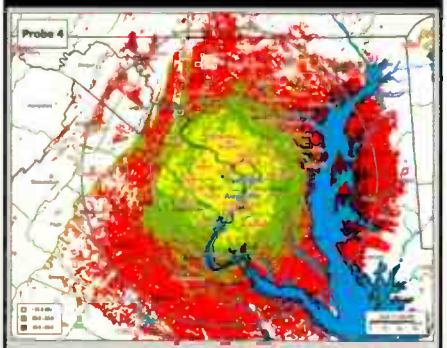

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1. Publication Title	2. Publication Number	3. Filing Date
Radio	3758	9/28/2012
4. Issue Frequency	5. Number of Issues Published Annually	6. Annual Subscription Price
Monthly	12	Requester

7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4®)
NewBay Media L L C
28 East 28th Street, 12th Floor
New York, NY 10016-7958
Contact Person: Kwentin Keenan
Telephone: 703-852-4804

8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer)
NewBay Media L L C
28 East 28th Street, 12th Floor
New York, NY 10016-7958

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)
Publisher (Name and complete mailing address)
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PS Form 3526-R, August 2012 PSN: 7530-09-000-8855

13. Publication Title: Radio	14. Issue Date for Circulation Data Below: September 12	
Extent and Nature of Circulation	Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies (Net press run)	9758	9697
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h. Total (Sum of 15f and g)	9758	9697
i. Percent Paid and/or Requested Circulation	92.7%	92.1%

16 ☐ Total circulation includes electronic copies. Report circulation on PS Form 3526-X worksheet.

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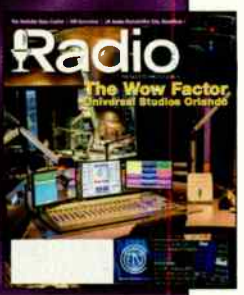

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Radio K: 100 Years of Broadcasting

By Erin Shipps

Radio K is celebrating 100 years of broadcasting from its first transmission of Gopher football games via Morse Code in 1912 to today. Professor F.W. Springer created 9XI at the University of Minnesota, which was later changed to WLB to KUOM to WMMR and finally KUOM Radio K in 1993. Radio K is an award-winning student-run radio station of the University of Minnesota.

Clockwise from above: Arden Ebert and William T. Dale, 1957; KUOM rehearsal, 1950; Amplifier and control panel, 1926; School of the Air crew, 1959.

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