

Radio

THE RADIO TECHNOLOGY LEADER

June 2011

RadioMagOnline.com

Colorado Consolidation at KTSC

Student-run radio upgrades

NAB SHOW REVIEW

Pick Hits, Editor's Picks, new products and more

FIELD REPORTS

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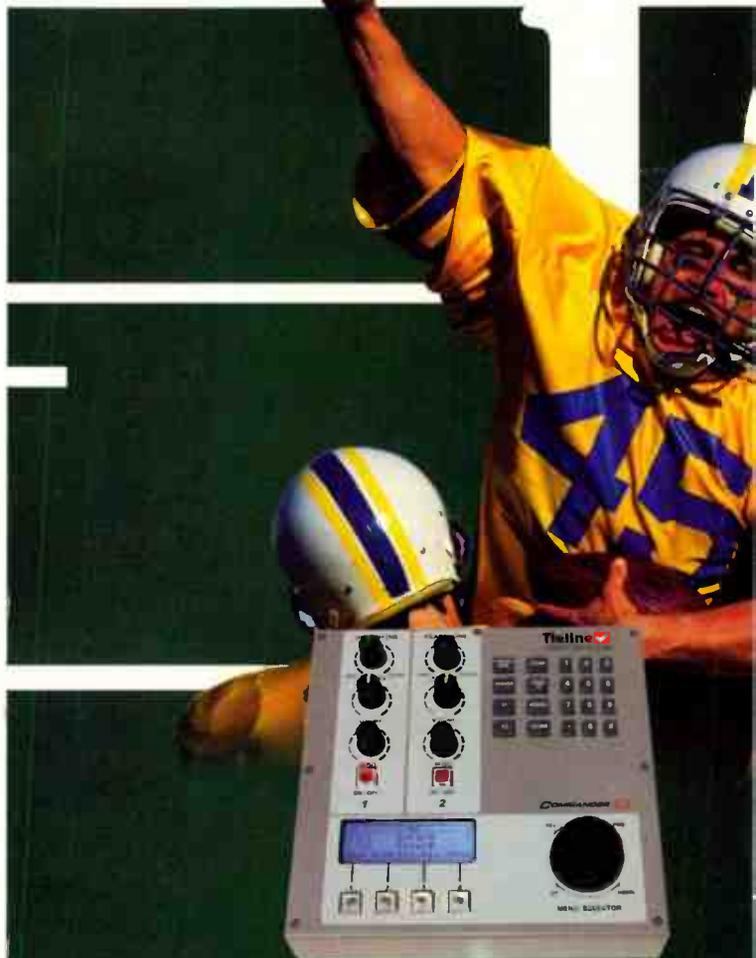
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Currents Online

Selected recent headlines from www.RadioMagOnline.com.

EAS @ 2011 NAB Wrap Up ➔

Gary Timm shared his view of EAS from the 2011 NAB Show at the AWARE website.

NYC Unveils Nation's First Public Safety System

PLAN is a free service that will allow customers with an enabled mobile device to receive geographically targeted, text-like messages alerting them of imminent threats to safety in their area.



Alabama Storm Warnings Use Alert FM for Signaling

In Alabama, the Alert FM system is deployed in 18 counties across one-third of the state.

Digital Alert Systems Dasdec, Monroe Electronics One-Net Complete IPAWS Conformity Assessment

The IPAWS Conformity Assessment verifies the products conform to requirements for receiving alerting messages from the FEMA IPAWS system.

Burk Technology Brings IP to GSC3000 and VRC2500

The GSC/VRC IP Converter offers IP connectivity tailor made for the GSC3000 and VRC2500.

TFT Offers Options for Model 3320 CAP-to-EAS Converter

The new options expand the capabilities and applications of the Model 3320 for text-to-speech conversion, external relay closure and an LCD setup panel.

Nautel Surpasses 10,000 Sales Worldwide

While Nautel started with solid-state transmitters 42 years ago, the recent history of company has been marked by accelerated growth.

Find the mic and win!

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

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Site Features

Pick Hits Videocasts

Want to learn more about the 15 top new products from the NAB Show? Watch the Pick Hits Videocasts.

Find Us on Social Networks

We're also on Facebook, Twitter and LinkedIn.

Digital Radio Update Twice a Month

Stay up to date with the source of digital audio broadcasting news and information. The coverage extends to DRM, satellite radio and more. Subscribe today.

Even More New Products

We post new product info online as we receive it, and not only the new stuff from the convention. The twice-monthly New Products Extra email newsletter brings them all to your inbox.

Advertiser Links

Web links to the advertisers in the June issue.

Industry Events

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



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the radio experience

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World Radio History





Another one for the books

Yet another NAB Show has come and gone. The frenzied week of meetings, sessions, exhibits and general broadcast camaraderie has such a long build-up, and then it seems it's over in a flash. Well, not completely over.

You know by now that attendance was up from last year, albeit not yet as high as 2008. But it's on an upward swing.

The increased attendance, coupled with the generally positive economic outlook certainly added to the overall positive feelings on the exhibit floor. All the exhibitors I spoke to said it was a good convention. Attendees as well had positive feelings about the week's activities.

So what was hot? That's the question I hear every year. The easy answer is to look at the *Radio* magazine Pick Hits. Look at the technology they cover and it's easy to get a feel for the trends at the convention. This year also adds the Editor's Picks, which are part of our convention review as well.

A topic of importance to the NAB was adding FM to cell phones. This was mentioned quite often, although outside a specific display, there's not much to see related to the idea. That's an ongoing discussion that for now has no obvious resolution waiting.

Adding data to transmissions and station websites continues to be a popular topic. While iBiquity continues touting and showing the Artist Experience features, automation system providers are further developing their content management capabilities to feed it, RBDS and website functions.

The data capability also related to increased attention to enhancing the listener experience of radio in any form. The basic program service data is merely an entry point. Feeding handheld apps, Twitter/Facebook integration and crowdsourcing are ways to attract listeners in the ever-expanding pool of media choices.

And while radio is obviously an aural medium, we're starting to get the hang of video. No, not to transmit slow-scan images, but as enhanced content on websites or via handheld apps. In the last few years, many stations have looked at studio

lighting options to stream shows from the studios. Now radio is looking at systems to capture and deliver video from the field.

Radio magazine is even getting on the video bandwagon with our first series of Pick Hits Videocasts. Get a closer look at the 2011 Pick Hits in these 15 videos at RadioMagOnline.com.

Meanwhile, underneath everything, we continue to see IP as an ever-present element. Audio over IP is only part of it, with many (if not most) codecs, studio mixing/routing, phone systems, automation and STLs including it. But IP control, including SNMP, is being added to nearly everything. With a browser or a dedicated app, it seems nearly everything was being accessed via some kind of handheld device.

A good portion of this issue is dedicated to what we saw at the 2011 NAB Show, but there's always more. I'm curious to know what you saw and found interesting. Let us know by commenting on the articles at RadioMagOnline.com. 

Chris Scherer

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A DIY approach to securing your site

By Kevin McNamara

As long as we have had remote transmitter sites, we have had the issue of keeping unauthorized people off the property. It wasn't really a problem when the sites were manned (anyone remember that?); however, the advent of remote control systems made that luxury disappear in the late 1960s. That was a different time: Generally people showed up to act on a testosterone- (or liquor-) induced idea that they would climb the tower, rather than plot to destroy the site. Here we are, post 9/11, in one of the worst economies the U.S. has experienced in years. Copper prices are more than \$4 per pound and your remote site represents a treasure chest to some people.

Keeping a site secure fulfills a number of objectives such as 1) Protecting the general public from potentially hazardous situations (i.e. electrocution, non-ionizing radiation, falling objects, etc.), 2) Deterring unauthorized people from climbing (or getting near) the tower(s), 3) Keeping exposed/exterior equipment (HVAC, power lines, coaxial cables, ground systems,

the FCC in 2002, The Media Security and Reliability Council (MSRC). According to the mission statement posted on its website, the committee exists: "To prepare a comprehensive national strategy for securing and sustaining broadcast and MVPD facilities throughout the United States during terrorist attacks, natural disasters and all other threats or attacks nationwide."

The MSRC's website has some great information, including checklists that will help you assess a facility's risk to a number of security threats.

Obviously the main components of keeping a site secure are adequate fencing, barbed wire, solid doors, locks, good lighting and alarms. But these keep out the "casual" thief. Anyone with a strong desire (and enough time) to gain access will breach your compound, so the question is really more of how to minimize theft or damage to the critical components of the transmission system, and what is the best way to monitor the site? This is also a problem faced by cellular carriers, who operate thousands of remote sites nationally. Interestingly enough, it isn't just the sites that are in the middle of nowhere that get vandalized; they experience more theft at sites in urban areas, including those on rooftops. Here are a few practical tips that you can use at your sites.

Outdoor components

The next time you replace your ground wires and other copper terminations, consider using silver- or tin-plated components. Apparently copper thieves tend to stay away from metals that look like aluminum. You get the same performance as using copper. This approach has proven to be an effective deterrent and is very popular with communications systems operators.

External HVAC compressor units, especially the ground-mounted variety, are a favorite target of copper thieves. There's not a lot you can do here except to get the units mounted on a roof, if possible. If you need to replace units in the future, consider commercial wall-mounted systems. They tend to be too much work to remove and are less desirable.

If you are building a new site, be sure to design the building so the coax entry ports and ice bridges are elevated as high as possible.



Remote sites are an attractive target for copper thieves.

guy wires, etc.) protected from damage and/or theft, 4) Properly securing all buildings.

Since the events of 9/11 there has been a great deal of focus on the security of remote wireless sites used for public safety, cellular and broadcast facilities. Various federal and state agencies and committees have created guidelines and checklists to help licensees secure their infrastructure, including remote/unmanned tower sites. One such committee was formed under

On existing shorter runs, coax can be mounted inside a cable trough with a locking cover. If the entry point for the coax is lower, you can have a custom dog house fabricated. The dog house is essentially an enclosure large enough to accommodate the number of cables and allow required bend radius. These are generally attached directly to an exterior wall or roof, covering the entry port on one side and connected to the enclosed cable trough on the other, ideally keeping the cables unexposed and protected.

Monitoring the site

Most sites utilize the remote control system to alert an operator that a door is open or a proximity sensor has gone off. While it might let you know someone has stopped by, it doesn't really tell what is actually occurring. The better solution is to implement a digital video recording (DVR) system that records several cameras, along with date/time stamping. These systems have become very affordable (less than \$1000, with cameras) and include some very cool features such as motion detection (through the camera). Cameras can be viewed remotely, including on

Resources

MSRC

www.mediasecurity.org

Zoneminder

www.zoneminder.com

3G smart phones, and can initiate notifications via voice, text or email.

If you feel more ambitious, have a PC lying around and have a little Linux experience, Zoneminder is a free open-source surveillance application that offers several powerful features not found in the lower-cost systems. For example, you could utilize an air-card at the remote site to enable some broadband access and view cameras in real-time, if the site isn't located near an area that offers traditional broadband cable, telco or wireless services. Zoneminder also supports standard video, IP cameras and X10 devices. Zoneminder is also flexible enough to be configured for multisite operation if desired.

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

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FCC studies impact on LPFM service

By Lee G. Petro

The February 2011 FCC Update provided an overview of the Local Community Radio Act of 2010 (LCRA), and the rule changes that the law requires the FCC to make in response. Changes to the level of protection that LPFM stations must provide to full-service FM stations and FM translators were discussed, along with ambiguous language relating to the establishment of priority of LPFM stations in relation to pending FM translator applications are awaiting resolution through a rulemaking proceeding.

The LCRA also required the FCC to conduct an economic study on the impact LPFM stations will have on full-service FM stations. Other than the general directive to the FCC that the study must be completed, no further direction was provided under LCRA as to what economic parameters should be reviewed, or how the study should look at the end of the day.

So, effectively with a blank slate, the FCC released a notice seeking input from the public on both the scope of the required study, along with information relating to the specific questions raised in the LCRA. The Commission assumes the study would necessarily

have on audience ratings for full-service FM stations. The Commission acknowledges that the service area of LPFM stations is relatively small, but questions whether LPFM stations draw audiences away from full-service FM stations in the same market. The Commission asks for before-and-after audience shares from those that would conclude that there has been an impact after the 2000 commencement of the LPFM service. Also, since more than 50 percent of the LPFM stations are outside of Arbitron-rated markets, the Commission is also seeking information on other ways to measure the audience in these markets.

Next, the Commission intends to study whether LPFM stations will economically impact full-service FM stations. While LPFM stations are noncommercial, the FCC notes that, through the underwriting and sponsorship of programs, revenue that may have previously been directed to full-service FM stations in the market may be redirected to LPFM stations. Thus, the Commission asks whether the LPFM service has had this impact since 2000, and whether there is any accurate reporting mechanism to determine the impact of more LPFM stations in radio markets.

The Commission is also looking to define the relevant markets before looking at the economic metrics. First, the Commission proposes to look only at the areas where LPFM and full-service FM stations have overlapping contours, as the Commission concludes that this is where most of the direct impact is likely to occur. Next, the Commission will look at the overall impact of LPFM stations in the respective Arbitron markets regardless of any overlapping service areas.

Notably, the FCC will not be looking at the economic impact of interference caused by LPFM stations to full-service FM stations. The Commission appears to have reached the conclusion that other portions of LCRA created remediation procedures that should eliminate the economic impact of interference on full-service FM stations. The Commission will entertain comment on whether this conclusion is correct, so parties that seek to have this metric considered in the report should consider submitting comments.

Given the breadth of the Commission's call for comments, those that have information on the economic impact of LPFM stations should strongly consider filing comments. It is likely that this study will establish the blueprint for any modifications to the service in the future. Comments are due to be filed June 24, 2011, with reply comments due July 25, 2011. 

Petro is a member of Fletcher, Heald & Hildreth, PLC, Arlington, VA. E-mail: petro@fhhlaw.com.

Dateline

June 1, 2011: All radio stations in the District of Columbia, Maryland, Virginia, and West Virginia file License Renewal application and EEO Program Report, and run License Renewal Post-Filing Announcements on June 1, June 15, July 1, July 15, Aug. 1, and Aug. 15, 2011. Non-commercial radio stations also file Biennial Ownership Report (FCC 323-E).

June 1, 2011: Radio stations in North Carolina and South Carolina run License Renewal Pre-Filing Announcements on June 1, June 16, July 1, and July 15, 2011.

June 1, 2011: Stations in Arizona, the District of Columbia, Idaho, Maryland, Michigan, Nevada, New Mexico, Ohio, Utah, Virginia, West Virginia and Wyoming must place their Annual EEO Public File reports in their public files.

August 1, 2011: All radio stations in North Carolina and South Carolina file License Renewal application and EEO Program Report, and run License Renewal Post-Filing Announcements on Aug. 1, Aug. 15, Sept. 1, Sept. 15, Oct. 1, and Oct. 15, 2011. Non-commercial radio stations also file Biennial Ownership Report (FCC 323-E).

be based on prior experiences with the LPFM service, despite the fact that the LCRA's study requires the FCC to predict the impact LPFM service will have on full-service FM stations, i.e., in the future. At the same time, the Commission does take a stab at suggesting several "metrics" that should be studied and for which it seeks more information.

First, the Commission seeks information relating to the direct or indirect impact that the LPFM service will

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World Radio History

2011

NABSHOW™

This year's NAB Show was a very fast four days. The overall positive mood seemed to make the event go by much quicker. Attendance was up, exhibitors were happy, the sessions were full. In short, it was a good convention.

With the looming CAP changes, EAS was an obvious hot topic. Likewise IP anything (routing, audio, control, messaging, you name it) was a common underlying theme. HD Radio, while not in the main spotlight, had some shining moments as well.

Underlying themes related to identifying new revenue streams and ways to interact with listeners. As the media universe continues to grow and further splinter the radio listening audience, stations are finding new ways to reach listeners and preserve their revenue streams. Crowdsourcing and data services are just two of those methods.

What follows is a synopsis of the convention in new products shown on the floor and highlights of our daily photo blog. The *Radio* magazine Pick Hits, a tradition since 1985, are included. And be sure to watch the Pick Hits videocasts for the winners. Links are posted at RadioMagOnline.com.

Chris Scherer

—Chris Scherer, editor

IP transmitting system WorldCast Systems

APT SmartIP with SureStream: Part of the SmartIP suite of IP techniques and features, APT SureStream enables delivery of broadcast-grade audio quality over cost-effective, public ADSL or wireless links. SureStream uses inexpensive IP links such as wireless 3G and 4G IP networks, LAN, WAN, Wi-Fi and simple ADSL. A combination of these can be used for increased redundancy. SureStream does not alter the audio to ensure continuity of service, nor does it switch between links depending upon performance, but rather it uses resequencing technology to seamlessly stream high-quality audio.

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What the judges had to say:

Two separate, diverse connections allow robust backup.

Physical diversity and router diversity are key.

2011 PICK HIT Radio

THE RADIO TECHNOLOGY LEADER

SNMP-controlled RF switch

ERI-Electronics Research

Smart Switch: Developed in a partnership with Broadcast Devices, Smart Switch is an update for the ERI line of motorized switches. The Smart Switch allows an Ethernet cable connection for control and status when connecting an ERI switch to an ERI ACS-100 switch controller and the PWR-100D power sensor and directional coupler. This allows for complete SNMP connectivity between this family of ERI/BDI products for monitoring and protection of RF systems for a simpler and cleaner installation versus the traditional methods that use multiple wires and significant installation labor. The system adds RF sensing to prevent the switch from moving while RF power is applied.

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What the judges had to say:

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High-intensity LED strobe Dialight

Vigilant L-856: This high-intensity system consists of three flash heads, three power supplies per level and one controller for the entire system. Up to 18 synchronized flash heads can be used on a tower. The three flash heads provide 360 degree coverage. The working voltage is less than 200Vdc, which is significantly less than traditional Xenon flashtubes. The units are sealed for protection from the elements. Patented optics provide sharp cutoff to minimize light pollution and ground scatter.

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What the judges had to say:

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AXIP console Axia Audio

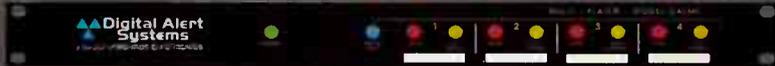
Radius: A compact networked mixing console with four stereo buses, eight faders, 16 audio I/O ports and an Ethernet switch with Gigabit. Radius features automatic mix-minus for every fader. Other features include: talkback, networkable, four GPIO machine-control ports, four instant-recall Show Profile snapshots, record mode with one-touch recording, monitor controls for an adjacent studio, fan-free mixing engine and desktop mount. Additionally Radius has switchable VU/PPM LED bar graph meters, 100mm conductive plastic faders, aircraft-quality switches with LED lighting, onboard NTP-capable clock, event timer and high-resolution OLED readouts on each fader strip.

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What the judges had to say:
 An entry-level surface ideal for dub and voice-tracking booths.
 Small size with lots of features.

Audio switcher Digital Alert Systems

MultiPlayer: MultiPlayer eliminates the restrictions of sharing a single Emergency Alert Systems (EAS) encoder/decoder system with relays and switches by provid-



ing multiple and completely independent EAS switching, playout and control to simultaneously cover the EAS requirements of multiple program streams. MultiPlayer is configurable for analog or AES switching of up to four program streams and networks to any DASDEC system for management and logging. In addition, the integrated switching and multiple GPI/Os for each channel makes facility integration easy.

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What the judges had to say:
 A cost-effective alternative to flash tubes.
 I've been asking for an LED beacon like this for years.

iPhone microphone adapter Tieline Technology

Mic Adapter: When newsgathering using ReportIT Live on an iPhone4, attach pro dynamic microphones with Mic Adapter. The adapter features a professional XLR mic input and dual headphone outputs for live interviews between the remote site and the studio. It also has adjustable mic gain attenuation, automatic gain control on/off, a

stereo line level input and is self-powered using two AAA batteries. Importantly, the Mic Adapter also features a mini-USB power input for iPhone charging during long broadcasts. The adapter can also be used for a variety of other iPhone Pro Audio apps. It is currently going through the Apple Accessory Certification process and the company expects it to be shipping before mid-year.

What the judges had to say:
 The design is great. It doesn't block the camera.
 It's an easy way to add your mic of choice to an iPhone.



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Pilot LOGITEK

DIGITAL CONSOLE

Less than a decade ago building infrastructure at even the most modest radio facility was difficult and costly. Today, AoIP is making it possible to replace miles of cables and closed systems with routers that use standardized network protocols. The **JetStream Mini** brings you the benefits of this new technology, and nothing is easier to use, faster, or less expensive. Add a **Pilot** control surface that includes the basic operating features your staff will need and you have the most cost effective AoIP networked audio system available.

The Pilot is easy on the eye and the budget and like the JetStream Mini, Logitek has built it with ease of use and durability in mind. The Pilot is a tabletop control surface that includes all of the basic engineering features your staff will need- and more- including 4 Program busses, 3 monitor sections and 24 mix minus busses. It is available in frame sizes for 6 to 24 faders.



JetStream MINI IP Audio Networking System

Looking for lots of power in a small footprint? The JetStream Mini lets you load up to 64 channels of I/O into a 2 rack unit and the Pilot will service even the most constrained spaces with ease. Configure your system with microphone inputs and analog/digital I/O to suit your specific needs, our use of standardized IP protocols ensures advanced AoIP networking with fast and easy setup... all for a price that won't break the bank.



Digital telephone hybrids

Telos Systems

Hx1, Hx2: The single-hybrid Hx1 and dual-hybrid Hx2 are packed with new features. Symmetrical wide-range AGC and noise gate from Omnia automatically manages levels and EQ. Built-in auto-answer, caller disconnect detection, audio leveling and anti-feedback routines

What the judges had to say:

Built-in processing for incoming and outgoing audio.

I have heard it make cell phones sound really good.



for enhanced two-speaker applications, call screening and line hold features, front-panel send, receive audio metering and an internal universal power supply are all standard on Hx hybrids. Other features include advanced PCTS hybrid algorithms, digital dynamic EQ and adjustable smart leveler, separate EQ high and low display meters, high-contrast icon display of line status and front-panel hold button.

816-241-7225; www.telos-systems.com
telos-info@telos-systems.com

HD Radio monitor

Inovonics

INOmni 632: The INOmni 632 combines all the features of a professional grade HD Radio monitor/receiver with important diagnostic and troubleshooting tools for analog FM and IBOC FM stations. Along with essential alarms, AES digital output and balanced analog outs, the INOmni 632 is the first scalable HD Radio monitoring system, and the first Inovonics product to offer a "no blend" mode, meaning the receiver will not fall back to analog if the digital signal is lost.

What the judges had to say:

Substantial RBDS and HD Radio data decoding.

It stays locked on the HD Radio signal at all times.



It can decode HD Radio multicasts up to HD8 streams and displays PSD, RDS and RT+ tagging data. Front-panel alarms for carrier loss, digital program loss and audio loss are also available on the rear panel as tally outputs.

800-733-0552; www.inovonics.com
info@inovonics.com

Video IP camera

Comrex

LiveShot: Weighing in at less than five pounds, the compact LiveShot will attach to a professional camera's battery mount and will get on the air with live, real-time, low-latency video and audio optimized to perform well on challenging 3G/4G cellular and satellite IP data networks. LiveShot also accommodates Wi-Fi and wired IP data connections and offers a store-and-forward feature that will capture, manage and send higher-resolution video to an FTP server when a live shot is done. Video return, integrated FB, Wi-Fi and Bluetooth interface are just a few of the additional features. The codec can be controlled and configured locally or remotely via the Comrex LiveShot Central server.

What the judges had to say:

Radio is using video more and more.

This is an easy way to get live video during an event.



800-337-1776; www.comrex.com; live@comrex.com

IP audio encoder/decoder

WorldCast Systems

APT Stream In/Stream Out Silver: Stream-In Silver is an IP audio encoder features a large range of algorithms including Enhanced Apt-X, MPEG 4 AAC-HE and linear audio. The unit is 1/2 x 1RU unit which is fully compatible with all other APT and N/ACIP-compliant codecs. The Stream-Out Silver IP audio decoder offers headphone monitoring, audio backup courtesy of either an on-board USB port or ShoutCast server, embedded auxiliary data and auto-detection of an incoming IP stream. Incorporating Audematis ScriptEasy software, the unit can also be utilized for remote control of other units at a remote site using TCP/IP.

805-249-3110; www.aptcodics.com
info@worldcastsystems.com

What the judges had to say:

The external hard drive makes this an ideal back-up audio source.

Providing multiple codecs makes it very flexible.

WHERE GREAT RADIO BEGINS

The new Harris® Flexiva™ FM Transmitter

The Harris® Flexiva™ FM solid-state transmitter family provides today's broadcaster with a transmitter platform capable of analog and digital operation. Incorporating field-proven Harris technology, the Flexiva family of products delivers world-class performance, reliability and quality.

Flexiva is designed for low- and high-power requirements, up to 20 kW, while utilizing the most compact design on the market today. Flexiva continues the legacy of the highly successful line of Harris FM transmitters and combines innovative, new Quad-mode RF amplification and software-defined exciter technology to take FM transmission to the next level.

Featuring Harris PowerSmart® technology in its transmitter architecture, the Flexiva line offers unmatched efficiency that makes it ideal for all FM applications and delivers a dramatic increase in power density, lower operating costs, servicability and reduced cost of ownership over the life of the transmitter.



Learn more at www.broadcast.harris.com or (800) 622-0022.

harris.com

HARRIS
assuredcommunications

Aluminum transmission line
ERI-Electronics Research

1329Line: These aluminum outer/copper inner conductor rigid transmission line systems are available in 3 1/4", 4 1/4", and 6 1/4" (both 50 and 75 ohm) sizes. The elimination of the copper outer conductor reduces component prices and weight, decreasing the support component complexity, cost and installation effort. ERI's bellows expansion compensator accommodates the differential expansion between the inner and vertical and horizontal spring hangers are designed to support the system and compensate for differential expansion between the tower and vertical and horizontal runs. The systems also include galvanic adapters to allow interconnection to new or existing brass and copper components.



812-845-6000, www.eriinc.com
sales@eriinc.com

What the judges had to say:

Much lighter weight is ideal for tower loading issues.

There's a built-in theft deterrent because it doesn't look like copper.

Audio processor
Omnia Audio

Omnia.9: Omnia.9 features separate processing cores for FM and HD-1 and (optional) HD-2 and HD-3. It also supports encoding to MP3 (Mpeg-1 Layer 3), MP2 (Mpeg-1 Layer 2), AAC, HE-AAC (including RTSP/3G for streaming to mobile phones), Ogg Vorbis and WMA Pro formats. A 7" touchscreen front panel, full remote control, on-screen keyboard, dynamically updatable RDS encoder, selectable SSB (Single Sideband) stereo encoder, and adjustable dynamic bass clipping are



part of the toolkit. HTTP push support for automation, such as dynamic RDS and streaming song titles, is also standard, as well as scheduled processing preset selection by depart. Omnia.9 also has dual, independent power supplies and native Livewire network connectivity in a 2RU package.

216-241-3543, www.omniaaudio.com
info@omniaaudio.com

What the judges had to say:

The unclipper is amazing.

The remote control and monitoring capabilities are also well done.

Advanced FM transmitter
Harris

Flexiva: This VHF FM solid-state transmitter provides radio broadcasters with a single platform to support analog and global digital standards. Quad-mode operation supports FM, FM+HD Radio, HD Radio-only or DRM+ digital broadcasting, while the transmitter incorporates Harris Real-Time Adaptive Correction (RTAC) technology to optimize power and minimize adjacent-channel interference. Flexiva transmitters are built on the legacy of Harris radio broadcast transmitters, including the ZX Series and its efficient power supply, cooling and control designs. Available in power levels up to 20kW, Flexiva transmitters also leverage Harris PowerSmart technology to create a compact, cost-efficient transmission solution with high power density and low operating costs.



800-622-9622, www.in.comcast.harris.com
lincoln@harris.com

What the judges had to say:

Amazingly small footprint.

Great redundancy as well.

IP phone callflow system
Comrex

STAC VIP: STAC VIP takes advantage of advances in VoIP and SIP-based technologies that allow for high-quality voice calls to be made from IP-based PBX systems, Smartphones, PCs and through popular VoIP providers. It provides a way to manage not only traditional POTS calls, but also VoIP and SIP calls from Smartphone apps (like Comrex ARC) "soft codecs" and even Skype.



800-237-1726, www.comrex.com
info@comrex.com

What the judges had to say:

Adding additional services, such as Skype, is the right step forward.

Separately the smartphone app is perfect for station branding.



More Online:
Watch the Pick Hits Videocasts at
RadioMagOnline.com.

A L W A Y S F I R S T



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Transmitter site audio playback**Nautel**

Push Radio: Designed for managing audio content to a remote site. Building on the local audio transmitters and leveraging the Internet distribution to send audio to the transmitter, which then plays the system will be expanded to logs back to the station. A switching audio inputs, playlists, settings based on time and date editor provides drag-and-drop Inside audio processor provides



VS Series transmitters. Push Radio

trials operations at the transmitter storage capabilities of Nautel VS AUI control system. Push Radio uses files and playlists to the content locally. send the as-played scheduler automates processor or other rules, while a playlist editing. The Urban the audio playback.

What the judges had to say:

This provides a full N+1 backup option.

It's a rudimentary player, but it offers so much practicality.

Pick Hits Judges

Bud Aiello

Director of Engineering Technology, NPR
Washington

Roswell Clark, CSRE CBNT, MCSE

DTO Tampa/Orlando, Cox Media Group
Tampa, FL

Bill Croghan, CPBE

Chief Engineer, Lotus Broadcasting
Las Vegas

Rick Kemp

Chief Engineer, Journal Broadcast Group
Boise, ID

Jim Leifer, CPBE

Director of Engineering, Clear Channel
Miami

Norman Philips, CBNT

VP Engineering, Townsquare Media
Dallas

Paul Shulins, CPBE

Director of Technical Operations,
Greater Media Boston
Boston

Martin Stabbert, CPBE

Director of Corporate Engineering,
Citadel Broadcasting
Reno, NV

Barry Thomas, CPBE CBNT

VP/Engineering, IFMC
Atlanta

Mike Tosch, CSRE CBNT

Chief Engineer, ESPN Radio LA
Los Angeles

2011 NAB Show Pick Hits Rules

1. Products must be new and not shown at a previous NAB spring convention. In some cases, distinguishing a new product from a modified older one is difficult. For "Pick Hits" purposes, a new product is one with a new model number or designation. Software, firmware and operating system updates are eligible, but the new revision must carry an obvious designation (1.0 to 2.0 for example) and the feature set must provide clearly identifiable changes or updates.

2. Products must have some positive impact on the intended user's everyday work. Judges search for equipment intended for use on a regular basis. Products should provide new solutions to common problems.

3. Products must offer substantial improvement over previous technology. Unique circuit architecture need not be included, but some new approach or application must be involved in the product's design.

4. The price of the product must be within reach of its intended users. The judges seek products appropriate to a wide range of facilities.

5. The products must be available for purchase within the 2011 calendar year. Equipment must be on display on the show floor, currently (or imminently) in production, and some type of product literature must be available. Judges take the exhibitor's word on availability dates. Products demonstrated in private showings do not qualify.

6. The Pick Hits judges operate independently from one another and remain anonymous to everyone including other judges until the selection meeting. This ensures that the products chosen are truly representative of the industry, that the judges were not persuaded in any way, and that the entire selection process is as fair as possible. The judge's identities are published in the June 2011 issue.

7. The editorial staff of Radio magazine serves only as a moderator during the final selection process and has no influence or decision in determining the winners.

THE ALL NEW GUEST MODULE™ GM2X6 TALK SHOW CONTROL SURFACE



SIMPLE ON THE OUTSIDE, POWERFUL ON THE INSIDE

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Introducing a modular family of talk show system components, JK Audio presents a powerful, easy-to-use system that your staff will love. With operation so simple your entire crew can learn its features without even cracking open the user guide.

The heart of the system is the new Concierge™ 2x6 Switch Core, which routes six incoming phone lines to the JK Audio innkeeper 1rx or innkeeper 2 Digital Hybrids. Concierge adds hold audio input, auxiliary phone integration, and intuitive call control.

Up to eight Guest Module control surfaces can be added to provide remote control over CAT5 cable. Guest Modules are hot swappable without losing calls, and are available in GM1x6, GM2x6, and GM1x12 desktop and rack mount models.



Above: Concierge Switch Core shown with our innkeeper 1rx Digital Hybrid

TOLL FREE: 800.552.8346 TEL: 815.786.2929 www.jkaudio.com

JK Audio

by Erin Shipps, senior associate editor



iPhone audio interface

Fostex

AR-4i: AR-4i is an audio interface for iPhone4 dock connector. The high quality stereo microphone inputs with A/D converter improve the audio quality of iPhone4's video recording, video streaming via Ustream, LiveStream and other services as well as recording of live performance and ENG. Main features include: Three microphone inputs with plug-in power for vertical or horizontal use (input level control and EQ can be done using the dedicated app); 2x cardioid plug-in microphones

come as standard, and third-party microphones can be used; LED level meter for input level monitoring; microphone gain control; headphone jack for input monitoring; and 2x AAA batteries for more than 10 hours operation. External power can be fed via USB. A screw hole is provided for optional camera mounts.

800-7-FOSTEX; www.fostexinternational.com; sales@fostex.com

35W power amplifiers

RDL (Radio Design Labs)

HD Series: These ultra high efficiency amplifiers are the first full-featured environmentally conscious "greener" mixer amplifiers for commercial installations. These products include studio quality microphone input stages, line-level transformer isolation, equalization, remote control capability and integral analog compression coupled to sonically pleasing analog-filtered high efficiency Class D output stages. An internal low-power-consumption processor monitors usage demands to completely shut down internal circuitry for maximum power conservation and extremely low long-term operating cost. There are three units with 4Ω/8Ω outputs and three units with 25V/70V/100V outputs (labeled with an "A" suffix), for a total of six models. The HD prefix stands for Half Dual (half rack width, dual RU height).

800-281-2683; www.rdl.net; sales@rdlnet.com

Wireless battery monitoring system

Staco Energy Products

FirstLine BMS: The new wireless FirstLine BMS Battery Monitoring System continuously monitors UPS batteries and provides real-time information, ensuring that batteries are ready when needed. Information is displayed through curves and bar graphs on the FirstLine BMS easy-to-read 6.4" LCD touchscreen monitor. The system measures and records battery cell voltage, battery string voltage, battery string current, battery room temperature, battery cell impedance, as well as battery terminal temperature. Managers can ensure that capacity conditions are continually met as well as the permanent availability of high quality energy. Because it is wireless, the FirstLine BMS easily integrates into existing applications.

937-253-1191; www.stacoenergy.com; sales@stacoenergy.com



Audio processing

Blade

Wheatstone

IP-88VE: Part of the WheatNet-IP Intelligent Network, the IP-88VE occupies a single rack space, but packs an impressive complement of eight fully independent Vorsis Embedded three-band stereo audio processors. Each processing



chain consists of a four-band parametric equalizer followed by a crossover and three bands of compression. The compressors each feed their own limiters, whose outputs are then fed to a broadband lookahead limiter for tight peak control. The Blade has its own local I/O, with eight stereo pairs of AES digital audio in and out, and can function as a standalone processing engine. Because it's a Blade, it can also instantly configure itself as part of a new or existing WheatNet-IP Intelligent Network, making its processing power available throughout that network. The IP-88VE is configured and controlled over Ethernet using a computer.

252-638-7000; www.wheatstone.com
sales@wheatstone.com

Digital hybrids

AEQ

TH-03: The TH-03 is an advanced digital hybrid that comes in versions for one or two telephone lines, and either analog or AES/EBU digital inputs and outputs. Each model has built-in signal level metering for each hybrid line. Feedback is automatically mitigated by the digital hybrid, and no adjustments or calibration are required. The two-line models include a mix-minus bus for multiplex communication while on-air or on-hold in the studio: Pressing the MPX button automatically establishes a conference between the two telephone lines, so only a single audio feed to and from the hybrid to the mixing console is needed. The TH-03 takes care of simultaneously getting both in-bound calls to the console, and provides audio from the console back to each individual telephone line, with both console audio and the other caller's audio. The TH-03 also has AEQ's built-in frequency extender. When activated, it moves all frequencies 250Hz upward on the send line and 250Hz downward on the receive line. This additional 2.5 octaves results in enhanced bass frequencies.

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



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**Monitor mounting
Middle Atlantic Products**

VisionFrame: Available in both free-standing and desk mount configurations, VisionFrame systems provide heavy-duty structural support for monitors. These versatile systems save integrators installation time with a simple, effective design that can be specified with the company's Middle Atlantic Designer 3D layout software. VisionFrame systems can be designed with monitor height more than 13' from the floor and with unlimited length.



973-839-1011

www.middleatlantic.com
sales@middleatlantic.com

**Portable mixer
Sound Devices**

MixPre-D: At the heart of the MixPre-D are two studio-grade mic/line switchable inputs with limiters, high-pass filters and selectable phantom power. To accommodate the increasing variety of



cameras and devices used in production today, it has output adaptability and serves as an flexible, class-compliant USB audio interface. The MixPre-D offers numerous analog output options including mic/line switchable balanced XLR, dedicated consumer mic-level on a locking TA3 connector and an aux-level output on 3.5mm connection. Digital outputs include balanced AES3 on XLR and USB audio connectivity.

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

**Automation system
OMT Technologies**

iMediaTouch v4.2: In addition to full support of 32- and 64-bit versions of Windows 7, the iMediaTouch V4.2 release has significant feature enhancements. iMediaTouch OnAir now provides "quick links" to a variety of social networking sites, auto ducking for liner EOM adjust, and a new audio library screen added to the blade section. Other feature additions include a new quick access library view in Log tools, Info and Backsell tabs with social networking links added to Voice Tracking, and a "Show Profiles" feature for iMediaImport that allows fully automated ingest of Internet delivered show content. OMT has also introduced new features in our iMediaArchive product designed for large radio groups and NPR stations looking to house very large SQL-based audio libraries. iMediaArchive provides Web browser-based enhanced customizable Boolean search capabilities within the database supporting such fields as composer(s), soloist(s), conductor(s), chorus, master genre and so on. iMediaTouchArchive users can now access audio content from within the iMediaArchive library screen and insert the files right into the MediaTouchOnAir log. Users can also create, edit, delete and save play lists within iMediaArchive and then insert those play lists to any position in the iMediaTouch OnAir log.

888-665-0501; www.omt.net; omt@omt.net

**Audio analyzer
NTI Audio**

Flexus: The Flexus audio analyzer offers a modular hardware concept, which allows customization for two or four parallel channel operation. The impedance



module supports speaker measurements for obtaining impedance plots and Thiele-Small-parameters. Individual input switcher and output switcher modules extend the audio analyzer to 14 input channels or 14 output channels connected simultaneously. The FX-Control suite operates several FX100 in parallel thus offering cascaded system measurements. For measurement speed optimization, the analyzer acquires all measurement functions in parallel. State-of-the-art measurement technologies comprising of fast glide sweeps, detailed stepped sweeps and a continuous meter mode further support fast and accurate measurements.

503-684-7050; www.nti-audio.com
info@ntiam.com

**Audio loudness meter
DK Technologies**

DK Meter: This compact audio loudness meter is no bigger than an iPhone and is designed to meet increasing demands from the market for cost-effective stereo and 5.1 metering, including loudness. DK1 is for anyone working in stereo, and the DK2 is specifically aimed at the 5.1 surround sound market. The meter is easy to use, easy to install and comes with its own desk-mount. It accepts digital audio inputs and is supplied with all known loudness measurement recommendations, as well as the standard DK-Technologies meter scales.



+45 4485 0255

www.dk-technologies.com
info@dk-technologies.com

MEET SAM... A COOL WAY TO MONITOR AUDIO LEVELS, BALANCE AND PHASE



When it comes to audio, a quick, accurate and intuitive way to know what's happening is essential for a successful result. That's where SAM comes in.



The **Stereo Audio Monitor (SAM)** is a stereo level and phase meter that incorporates Single Stereo Display* technology. SAM provides a visual indication of the levels and phase relationships of a stereo audio signal. The unit indicates the usual Left and Right channel levels, and also displays the Sum and Difference components of the stereo signal.

SAM's dual tri-colored Single Stereo Displays show this information in an intuitive and easy-to-comprehend format. Both analog and AES/EBU digital signals can be monitored with SAM. Its compact size allows monitoring three stereo audio sources in only 1 RU of your valuable rack space.

Slip SAM into your audio chain and see what you've been missing.

(*Patent pending)



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Crowdsourcing app Broadcast Electronics

CrowdControl: CrowdControl is a set of studio tools for enabling listeners to make real-time decisions on what music is played while at the same time letting them interact with station talent through social networks like Twitter and Facebook. The application is initially offered in two tiers. The first allows radio stations to present voting blocks, so listeners can vote on a particular song to play at a set time. The second tier allows the radio station to run 24/7 under listener control within station parameters. Ideal for HD Radio multicast channels, the second option offers built-in rule and schedule mechanisms to ensure that the station follows acceptable programming guidelines.

217-224-9600; www.bdcast.com
bdcast@bdcast.com



Linear PCM recorder Olympus

DM-620: Featuring a three-microphone Trespac system designed to capture low frequency sound for premium recordings, the DM-620 also offers voice guidance for users with assistive needs as well as auto-leveling, scene select, noise cancelation, zoom microphone and low-cut filter. This compact, lightweight recorder features a sleek metal body with uncompressed 16-bit/48kHz linear PCM recording format. The Trespac system employs two condenser stereo mics and a center omni-directional mic capable of capturing lower bass ranges down to 20Hz.

888-553-4448; www.olympusamerica.com



Acoustic panels Auralex Acoustics

Elite ProPanels: These fabric-covered, absorptive panels designed to provide an aesthetic, yet cost-effective alternative to full-blown custom installations. Elite ProPanels are designed to absorb excessive reverberations and diminish other acoustical anomalies, providing a more pleasing and accurate listening environment. The panels feature industry-leading, resin-hardened edges and cover the spectrum in terms of finishes, styles and colors. They feature maximum flame retardancy and meet the Class A fire-rating per ASTM test E84.

317-842-2600; www.auralex.com; auralexinfo@auralex.com

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1-800-733-0552

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Dasdec triple port Ethernet expansion option Digital Alert Systems

EXP3NICGIG: The EXP3NICGIG adds three additional 10/100/1Gig Ethernet ports for a total of four independent Ethernet ports in the DASDEC-II emergency messaging platform. The only encoder/decoder with four completely independent and assignable Ethernet ports, the option allows users to easily allocate each port for a different network; a port for external access, a port for different users, and perhaps a firewall for any outside access. The unique benefit is multiple points of access across domains without needing complex bridges or modifying routing tables in existing equipment. To further ease integration each port can be assigned a static IP address, while ports one and two can also be set for Dynamic Host Configuration Protocol (DHCP). With two lamps per port indicating link (green) and activity (amber) it's easy to confirm connection and communications between devices.

585-765-2254; www.digitolalertsistemas.com; info@digitolalertsistemas.com



Stereo audio monitor Henry Engineering

SAM: A digital/analog stereo level and phase meter, SAM uses single stereo display technology to display both channels of a stereo audio signal using one LED meter. The display utilizes tri-color LEDs, showing the left channel in green, the right channel in red, and both (L+R) channels displayed in yellow. By watching the display, an

observer can easily read the levels of both audio channels, see the balance between the channels, and instantly see if a channel is missing. SAM uses a second single stereo display to show the sum (L+R) and difference (L-R) components of a stereo signal. An observer can instantly see if excessive L-R levels could indicate phase error or a polarity reversal in the audio chain. The meter accepts either an AES/EBU digital input or analog inputs. It accurately indicates system levels over a range of -25 to +3 VU. A headphone jack is provided for aural monitoring.

626-355-3656; www.henryeng.com; info@henryeng.com

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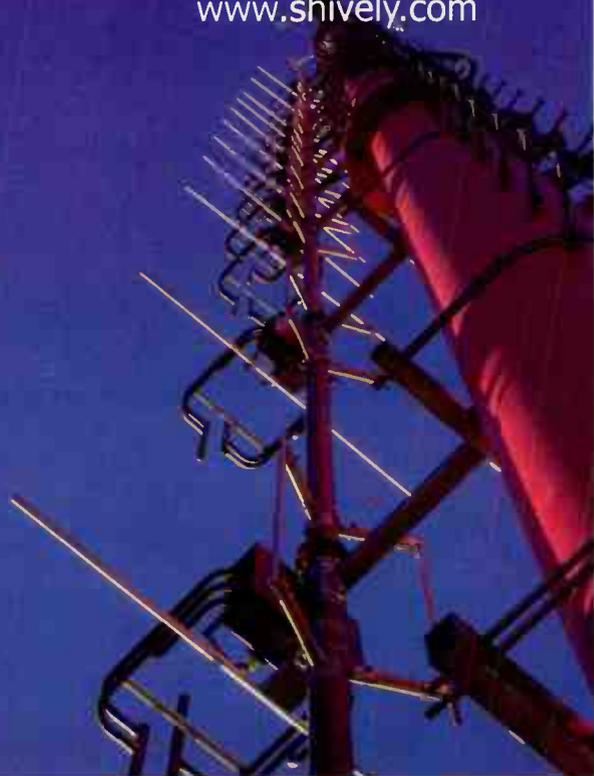
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(OFC) conductors, a 90 percent OFC braided shield, and a beefy, 6.8mm outside diameter (OD) jacket. REAN connectors feature silver-plated contacts, zinc die-cast housing, quadrangle design, chuck-type strain relief, rubber boot kink protection, and a robust locking latch. Standard models come in 3', 5', 10', 25', 50' and 100' lengths and hi-Z models are available in 5', 10' and 25' lengths.

714-522-8878; www.hosatech.com; lee@hosatech.com

FM/AM rebroadcast receiver

Crown Broadcast

CT-1 FM/AM: This FM/AM receiver can be used with all Crown units up to 600W. It features 50dB quieting sensitivity (mono) of 11.2dBf and 60dB quieting sensitivity (mono) of 17.0dBf. Other features include THD (1kHz mono) of 0.03 percent, stereo separation (1kHz) of 61dB, signal-to-noise of 65dBf (mono) of 79.5dB, and adjacent-channel selectivity of 82dB (noise limited).

800-262-8919; www.crownbroadcast.com; fmsales@irec1.com

Portable broadcast kit

PTEK

Radio Station in a Box (RIAB): The Radio Station in a Box (RIAB) contains all the equipment to have a stereo FM radio station up and running in a matter of minutes. This portable system can be used for natural disaster sites or as a back-up for a transmitter site – even in remote locations. The system is pre-wired and ready to go. Simply install the antenna on the highest point of the building, run the coax to the transmitter, hook up the ac power (either local or generator), and it's on the air. Using a laptop as the audio source gives greater flexibility. Programming with the optional radio automation software could not be simpler. Built-in wireless (where available) gives the option of broadcasting any streaming Internet audio source. Or, just put in a CD to play tracks and use the microphone for announcements. System includes: FM broadcast transmitter, BSI Simian Radio automation, desktop mic, 5/8 3dB gain antenna, coax cable with connectors, 220Vac input 50-60Hz, FCC-certified for LPFM, and housed in 4RU shock-proof rack case.

888-889-2958; www.ptekpower.com
sales@ptekpower.com

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clear crisp bright sound

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Results 1 of 1



OPTIMOD - FM 8600



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 Kevin Scott, Chief Engineer - KSWD Los Angeles

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CD player/minidisc recorder**Tascam**

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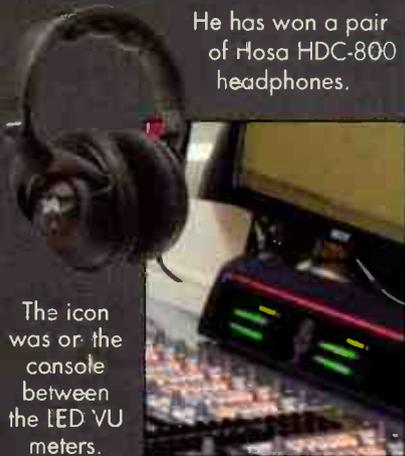
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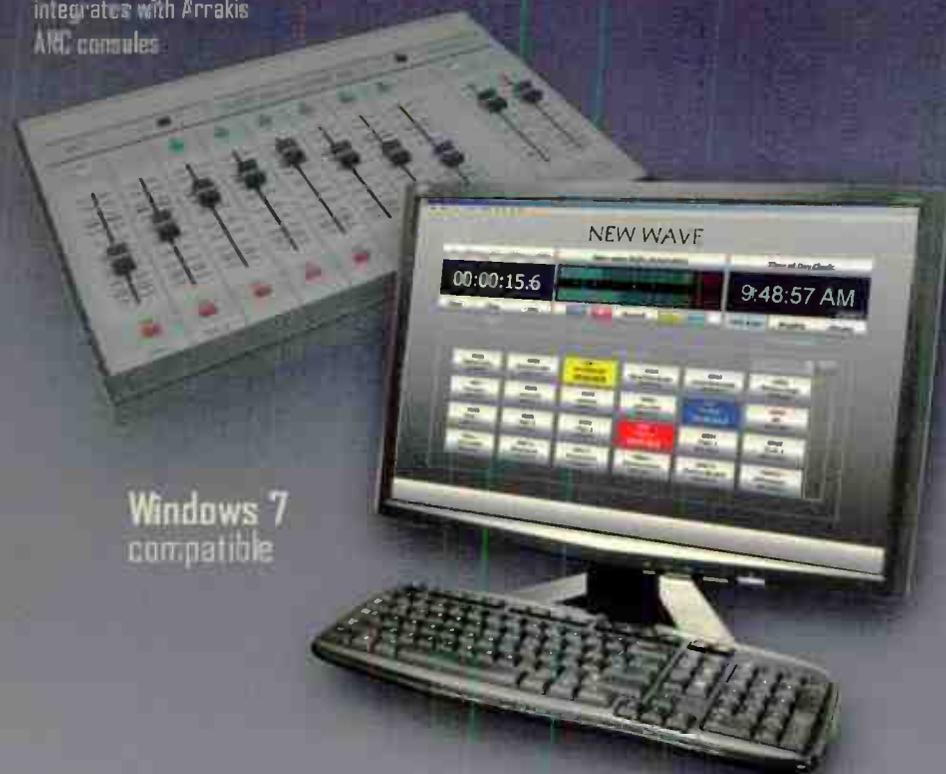
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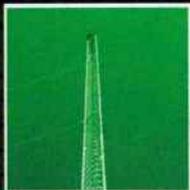
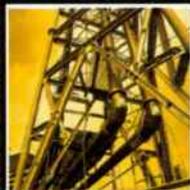
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Views from the convention as seen through our reporters' lenses.



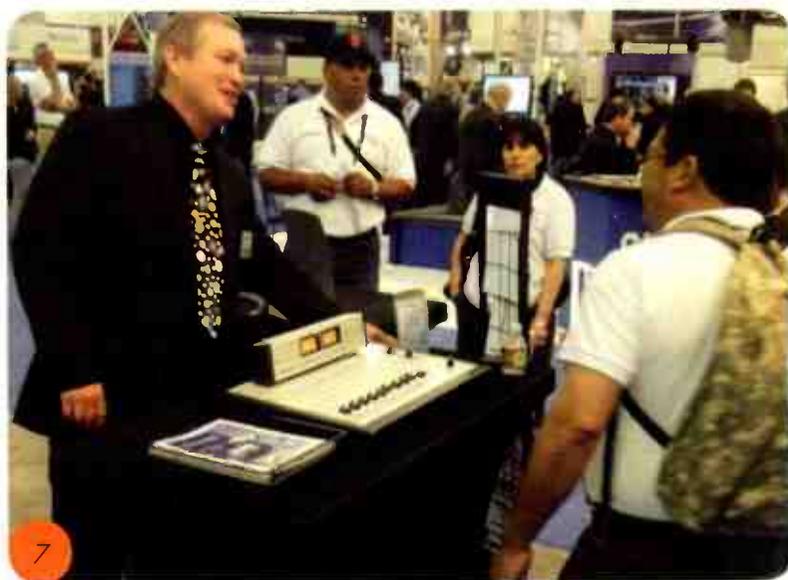
1. OMT demonstrates the features of its iMediaTouch automation system.
2. Zetta is the new automation system from RCS.
3. NPR Labs received an NAB Technology Innovation Award. Mike Starling (left) accepts from NAB President and CEO Gordon Smith.



See more of the *Radio* magazine Photo Blog at RadioMagOnline.com.



4. Transmission line as art and identity, as show in the SPX booth.
5. The Society of Broadcast Engineers held its annual membership meeting on Tuesday afternoon.
6. The Audioarts IP-12 is one of the new offerings from Wheatstone.
7. Getting the scoop on the Arrakis ARC-10 console.





8. Omnirax discusses furniture options and layouts.

9. Radio Systems shows the new Platform console surface in the Broadcast Electronics booth.

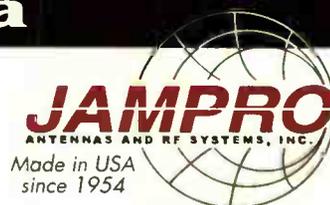
10. Yellowtec, in the BGS booth, added accessories to Mika support products.

11. The Mobile Broadcast Lab made a big impact for Orban.

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Colorado Consolidation

Colorado State University-Pueblo combines media efforts, building a new studio for KTSC 89.5



By Sam Lovato

KTSC 89.5 recently celebrated its 40th year of operation serving southern Colorado. Within a four-decade span the station has transformed from a 10W experiment into a Pueblo radio staple. Listeners over the years have enjoyed a multitude of programming alterations.

If you dialed up 89.5 in the 1970s, you would have heard an eclectic combination of jazz, rock, classical and blues. The 1980s added an emphasis on contemporary artists and the station's first trials with public affairs, news, sports, and talk content. During the 1990s, KTSC-FM had success reaching audience members with AOR, modern rock and CHR. By the end of the decade the station had

adopted the moniker "Rev 89, the Revolution," and earned the #2 rank in the market with a 7.7 12+ AQH share. In January of 2002 Rev flipped formats to rhythmic/CHR and ratings pushed even higher, they were the #1 rated station in Pueblo two years in a row earning a double-digit 12+ AQH share during the spring of 2003.

By 2004 the station had started to prepare for a major overhaul in studios, production space, and transmission. The Mass Communications Department and Center for New Media (MCCNM) at Colorado State University-Pueblo, which owns and operates KTSC-FM, had also begun the sketching process to consolidate the emphasis areas of the

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major under one roof. Department Chair Jennifer Mullen says, "It became increasingly difficult to provide quality curriculum with faculty, courses, and media labs spread between two buildings at opposite ends of the campus; today's convergent media environment requires integration and we knew the answer was to move the department into the public television station. We have partnered with public television for 30 years anyway, and the move would solidify that relationship, as well as provide a real environment of media integration. The move would energized the students at KTSC-FM who would now be the focal point in the foyer of the building, and no longer relegated to old offices in an outdated facility."

This would ultimately mean moving the department's student media labs, which included the FM, a magazine and an online newspaper across campus. The plan also called for relocating the offices of seven professors, creating a new iMac lab with 22 stations, and building a server/network independent from campus fiber connections that could support the needs of MCCNM students, faculty and staff.

The power upgrade

In 1997, the KTSC-FM license application hiccupped on a question about ERP compliance, so



The Rev 89 main studio is built around an Arrakis ARC-15.

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Master control at the CSU-Pueblo Buell Communications Center.

the department felt compelled to replace the station's transmitter and antenna that had been in service for more than 20 years. The antenna was a Phelps Dodge CFM-LP-4. With the relicense process starting in the fall of 2004, the majority of the year was spent securing funding for and installing a Harris Z5FM 5kW solid-state FM transmitter equipped with the Harris Superciter FM exciter and the ERI LPX-6C-HW low-power circularly polarized FM antenna with 1/2-wavelength spacing.

KTSC-FM was granted relicense in April 2005 and the department shifted its focus on a move to the Buell Communications Center (BCC), which housed the offices of a Rocky Mountain PBS affiliate, a 2,500 square foot TV studio, four production suites, a student PC lab and a couple of classrooms. By 2009 campus administration had approved the move and a facilities facelift to accommodate MCCNM and several new admissions offices that would be housed in BCC as well.

The department allocated roughly \$80,000 to pay for Rev 89's new studios, the iMac lab, software updates, new video cameras and lighting kits, and the server/network. Specifically, the FM rebuild budget came in around \$15,000; MCCNM needed affordability and durability in their choices.

Faculty and staff attended the 2010 NAB Show to finalize decisions about studio furniture and multiple equipment improvements for both audio and video. Ultimately, they settled on Arrakis for the majority of the Rev 89 upgrades. The company's consoles coupled with its Gemini/Digilink automation system had helped transform the station in the 1990s. KTSC-FM Station Manager Mike Atencio noted that Arrakis' proximity to Pueblo was part of the decision.

Chief Engineer Dan Thomas looked at the studio project from several perspectives. First, he wanted reliability and equipment the stu-

dents would probably face in the industry. Second, with the studios moving into a highly visible area they needed to look professional and inviting to prospective students. Lastly, the tight budget and state regulations were an important consideration.

Atencio and Thomas chose the ARC-15 for the main studio and the ARC-10BP for production. KTSC-FM staffers needed at least four microphone channels and 10 source channels in the main studio to handle the station's I/O needs. They considered the PC soundcard channel for audio playback and record a definite plus; the telephone interface and cue system were more than adequate.

The 10-channel production console was ideal because it allowed Rev 89 staffers to connect multiple audio sources to be seen on real VU meters. The console also suited the needs of RMPBS producers building soundtracks or laying down voiceovers, as the production room is shared by both MCCNM and the affiliate.

The Arrakis Balanced U seemed like a fitting choice to support the ARC-15, microphone booms, an audio editor, a couple of PC monitors, and KTSC-FM's various rack mount units. Staffers wanted furniture that could comfortably accommodate three announcers and a board operator. Atencio admits the Balanced U was a bit outside the budget, but after seeing it on the exhibit floor at NAB

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Colorado Consolidation

they were sold.

The department picked the Omnix FRC36MAF to house the production studio equipment. It was an affordable, capable furniture choice considering the surface could double as an inviting video editing suite if needed.

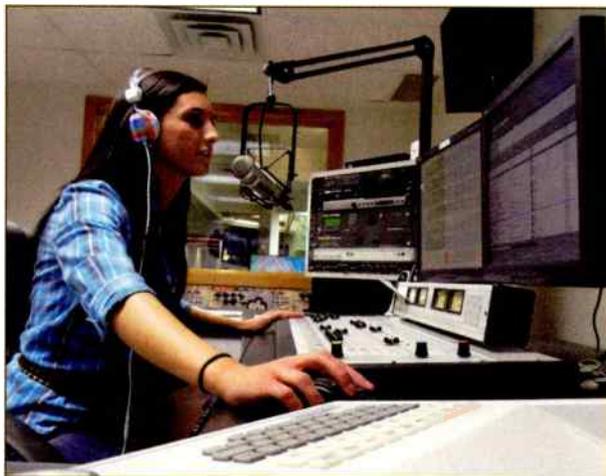
Stay on time

The studio installation took just less than two weeks. The timetable was based on two variables: equipment delivery and the completion of fiber lines to connect the new studio to the transmitter site. Thomas broke the ice on the installation by assembling the Omnix furniture and inserting appropriate production pieces. Next, he pulled together the Balanced U and began building all of the I/O connections for the station's audio sources. With university fiber in place, he locked in the station's Lascomm multimode fiber units. This fiber connection eliminated a pair of old analog audio cables that ran almost 1,000'.

Early on in the planning process, Thomas had communicated to the department that he wanted to get the students involved in the installation. KTSC-FM staffers were already pumped up about the possibility of a new main studio and production room so it didn't take much convincing to get them to lend a hand. Rev 89 Student Station Manager

John Dalton says, "The move went a lot smoother than I expected, the staff was really helpful and excited to get into the new studio." Thomas says that working with the department's student broadcasters, who as he put it, "are the real KTSC-FM soul and sound," was enjoyable. Thomas says the students offered suggestions and help whenever needed, and they learned on the job at the same time.

RMPBS Producer Ken Sciacca was also



Taylor Zinanti broadcasts afternoon drive from the main studio.

looking forward to having new neighbors at the television station considering the Rev 89 move to BCC would create new prospects for collaboration. Shared use of the audio production booth means a better utilization of space and resources. Students can put their production skills to use doing voiceover work for the TV station. RMPBS staffers thought the increase in student presence might also provide

Equipment List

Main Studio

360 Systems SC182 ShortCut
Adobe Audition 2.0
Arrakis Accent Balanced U,
ARC-15
Carvin H400
CSI FM/AM P-FA
DBX 286A
Electro-Voice RE27
Gemini CLX-01
Gentner SPH10
Powergold
Sage EAS Endec, Endec
receiver
Scott Studios SS.32
Tascam CD-RW9075L

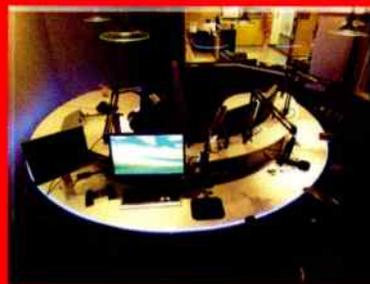
Production Studio

Adobe Audition 2.0
AM/FM stereo receiver
Arrakis ARC-10BP
Carvin H400
DBX 286A
Electro-Voice RE27
Fostex CD200
Omnirax FRC36MAF
RCA STA-3850
Roland DS-50A
Scott Studios SS.32

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Revolution staffer Javier Banuelos edits a promo in the production room.



Chief Engineer Dan Thomas assembling cables on day four of the installation.

more opportunity for majors to get involved with the television production that takes place daily.

The only real issues the team faced during the installation were getting every thing in place to start the work. Thomas says there were some ordering glitches and paperwork involved that slowed them down a bit, but the university staff always came through. He

added, "As a broadcast engineer you always would like to have more new goodies but economies must be obeyed; the overall experience was great fun for me, we're lucky to have an administration that is supportive of the station and staff."

Lovato is an associate professor in the Mass Communications Department at Colorado State University - Pueblo.

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— Mike Atencio, KTSC-FM Rev 98 Station Manager

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Installing a directional antenna

By Doug Irwin, CPBE AMD

Perhaps you've had occasion (or will soon) to put up a directional antenna on a tower—say for example, an antenna for a translator or booster. Many times this type of antenna is an "array" made up of two antenna elements or more. The station's construction permit will specify the bearing angles of the antenna elements, reference to true north. So before the day that the riggers are on the tower, looking down at you expecting an answer, you should consider just how to set this angle in the field.

Fortunately, with a few simple pieces of information, and some geometry, it can all be figured out ahead of time. The key piece of information is the relationship between the tower faces and true north. The tower owner should have that information from drawings when the tower was erected. A land surveyor will have included that information on the drawing. Look at Figure 1 to see what I mean. To

so I'm going to use the line AB as our reference bearing. Once that is clear to you, take a look at Figure 2.

Now in Figure 2 (not scaled by the way) I've depicted a horizontally polarized yagi attached to leg B.

Take a look at these two relationships:

Reference bearing – target bearing = remaining angle

180 – remaining angle = set angle.

Here is a quick example: Let's specify the target bearing (taken from the CP) as 111 degrees. Then, from Figure 2 we have:

$150 - 111 = 39$ and $180 - 39 = 141 =$ set

angle [with respect to tower face AB].

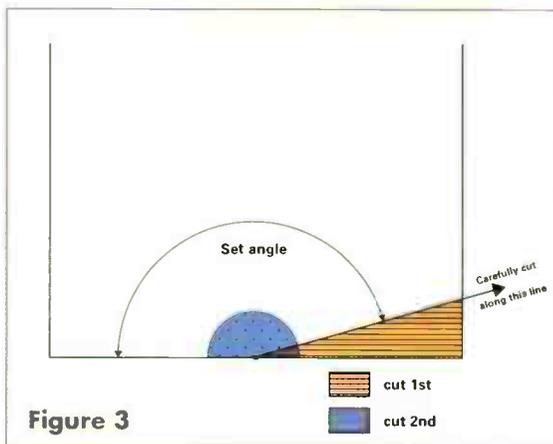
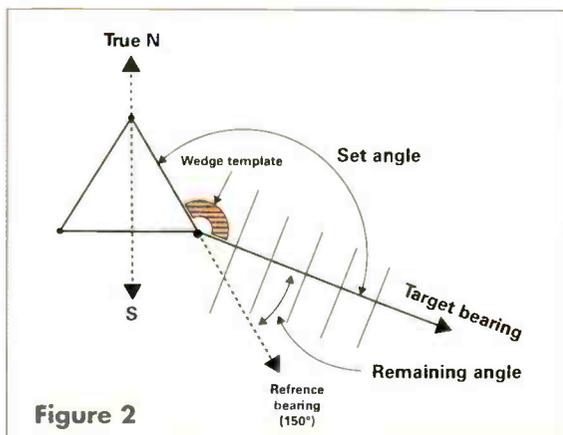
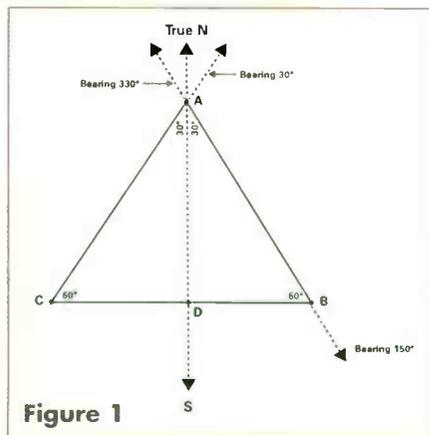
Of course I've made this a simple example by orienting the tower conveniently. Going back to Figure 1, the line AD is at a bearing 180 degrees true (and our reference angle is 150 degrees true). If, from drawings, you found that this angle is rotated clockwise (easterly) then simply add that clockwise rotation in degrees to the reference angle. If the line

AD is rotated counterclockwise (westerly) then subtract that rotation from the reference angle. Once you have your reference angle, use the same two equations above.

So now you have your "set" angle. How do you get your riggers to implement it? Easy, actually. You're going to create your own "wedge" (or pie slice if you prefer) with a piece of cardboard, a protractor, a straight-edge and a sharp knife. Take a look at Figure 3. Using a piece of stiff cardboard, and a protractor, mark the set angle, and then carefully remove the part of the cardboard that corresponds to the "remaining" angle. (You may want to consider cutting a semi-circular portion out of the center as well.)

Give this template to your riggers, and tell them to use it in setting the direction of the boom for the antenna that they're pointing. (Refer to Figure 2 again.)

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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make this example clear, I've set this tower so that the line BC goes directly east to west. Digging up your memories of geometry class, you can then see that the line BA is pointed at a bearing of 330 degrees true. Conversely, the line AB is pointed at a bearing of 150 degrees true. In this example, the antenna will be mounted on leg B,

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Blue Microphones Mikey

By Chris Wygal, CBRE

Imagine for a moment that you're a reporter for a local FM talk station. One day at lunch, you're at a diner on Main St. enjoying a BLT. Suddenly, a transit bus collides with a stopped car right in front of the diner. Then, another car runs into the bus! The next thing you know, there is a major traffic event downtown. As you pick up your iPhone to call 911, you notice it's 12:51, nine minutes until the next news break. The only thing you've got is your cell phone. There *must* be an easy way to file a report with full-bandwidth audio. Incidentally, there is. The Mikey from Blue Microphones snaps onto your iPhone, enabling crystal-clear stereo audio to be recorded

and quickly uploaded to an FTP server. It's very easy to install and understand. The only thing that is hard to understand is that you're preoccupied with audio quality during a disaster like this!

By the way, nobody was injured in the accident. It was just a nasty fender-bender, and your report

bypassed. A three-position sensitivity switch allows for attenuating the microphone depending on source SPLs. Mikey swivels 230 degrees to allow for proper placement. As a handheld mic, tilt it back to emulate the pickup pattern of regular handhelds. If placed on a desk, tilt it forward to face the sound source. Two transducer-type pressure gradient cardioid condenser elements live inside the mic capsule with a frequency range of 35Hz to 20kHz. Mikey's output sample is 16-bit, 44.1kHz.

Put into use

Given the nature of radio, Mikey would most likely find the majority of its use in on-location interview situations. While testing, it was used as a handheld mic and moved back and forth between the two voices. It was also placed on a table between the two voices. Mikey works extraordinarily well as a handheld mic, especially in the area of rejecting handling noise, and of course, overall frequency response. However, the on-table placement was the most interesting. While Mark (our production director) and I chatted back and forth as if conducting an interview, I placed Mikey between us about 2' away. We talked normally and found that off-mic proximity issues were hardly, if at all noticeable. The sensitivity setting was on the middle position and levels were perfect. The stereo nature of the recording also allows for phenomenal capturing of natural sound. The stereo image is reproduced very

Performance at a glance

Simple interface with iPod and iPhone

Stereo cardioid pattern with 35Hz to 20kHz response

BlueFire app for easy recording and file management

3.5mm jack for plugging in external sources

sounded fantastic. Now we can talk at ease about Mikey. It will work on most generations of the iPod Touch, Nano and Classic, and the iPhone 3GS or earlier (an iPhone 3G, was used to test for this article). The mic itself will plug into the port on the bottom of an iPhone or iPod, and it has a handy mini USB plug on the side. This serves as a power port to power the device since Mikey is using the power port. A 3.5mm jack on the top is an input for recording audio from stereo sources, like the output of a CD player, for example. When the 3.5mm jack is active, Mikey's microphones and sensitivity switch are

accurately. Operationally speaking, the easiest part about Mikey is that the iPhone (3G is this case) is immediately recognized by the device. No driver or software installation is necessary. In addition, Mikey is more than just an interview microphone. The stereo configuration makes it very handy for recording music. When placed in front of guitar, a warm, clear and full response is reproduced.

Recording, editing, uploading

Blue FiRe is a downloadable application available for iPods and iPhones that provides an easy-to-use recording and playback interface. Familiar transport features and file management via FTP make recording and sending audio very efficient. As an example, in an environment with Wi-Fi, a 50-second interview was uploaded using Blue FiRe's FTP feature. The file was ready for download within seconds of pushing the stop button. It was stunningly fast. Also within Blue FiRe are the adjustments for mic gain and quality, plus several nifty features like timed recording, level thresholds and indexing (great for marking time in an interview). A level meter is displayed right under a big counter displaying minutes, seconds and frames.

We live in a time when audio recording devices are getting smaller. In addition to recording, other developers have created apps for iPhones that allow for IP-based RPU connectivity. Not only does Mikey complement recording technology, but now full-bandwidth audio can be captured, edited and transmitted live from a cellphone. Blue Microphones has aided the process immensely. Mikey transparently and cleanly captures stereo audio and the quality is tough to match. 🎤

Blue Microphones

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

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IK Multimedia iRig Mic

By Barry Thomas, CPBE CBNT

The Apple iPhone, Android-based and other mobile devices have become ubiquitous tools for field production and on-the-spot radio. Software manufacturers have responded by providing all sorts of production and ingest apps to leverage and improve the tool. Face it: Since almost everybody carries a cellphone now, it makes sense to use it to gather remote audio. These devices present some unique challenges for using a device not specifically designed for the application. One area of improvement is the microphone, for both quality and ergonomic reasons.

A number of adapters are available that allow you to connect some professional microphones to mobile devices. The limitation with adapters is that some mics and headphones work better than others. Only through trial and error do you really know how the device will work. The

Performance at a glance

Quality condenser-electret unidirectional capsule

Rugged, durable metal housing

Simple and easy to use

Dual mini-connector allows real-time monitoring on headphones, speakers, mixers, PAs

Includes free recording app

Can be used with other apps

iRig Mic incorporates the iPhone-compatible mic/headphone adapter with a high-quality cardioid microphone that's proven to work with the iPhone.

Before I received the iRig Mic, I did what many of us do: searched the Web. I found it interesting that most of the reviews and comments about this device were actually about the iPhone App called Vocal Live, not the mic itself. I thought this was curious but, considering the environment of most consumers, not surprising. The hardware itself is fairly simple and straightforward. Most consumers will be interested in the application.

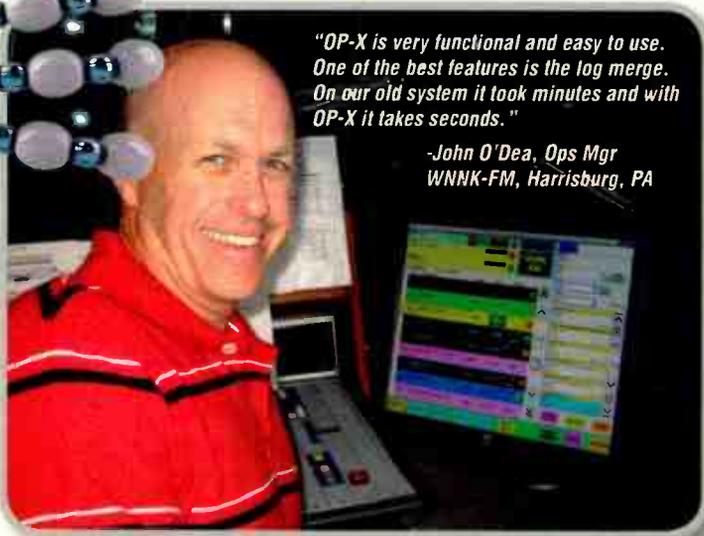
Most readers of *Radio* magazine will use this mic with one of several iPhone/iPod/iPad apps for radio circumstances: RCS iPush, Tieline ReportIt, Enco iDAD for example.

Getting connected

The iRig Mic is a unidirectional electret-condenser mic with the look of the Shure Beta microphones. It has a permanently attached 6' cord with a special 1/8" plug that holds the mic cable and a 1/8" headphone jack. As you might expect the headphone jack extends the regular headphone jack but it allows for real-time monitoring using typical ear buds or high-impedance headphones with a 1/8" plug. It has a three-position mic sensitivity switch on the side. This is one of two accessories of this type made by IK Multimedia. The other is a similar device but it's designed for guitars. Both devices work with the iPhone, current version iPod Touch and iPad.

I found the mic sound to be fairly good, especially considering this price range. It's an electret condenser, like the iPhone on-board mic, but it has better high frequency response and it's unidirectional. The cardioid pattern isn't extremely tight but it's enough to help isolate excessive room noise in normal environments. It performed pretty well in interview and recording tests using a variety of applications. The iRig seemed to have an acceptable amount of gain as well. All of the apps I worked with accepted the mic audio and controlled the headphone level and mix well.

There are a few quirks. The attached cord actually makes things a little complicated. It's designed apparently to connect to an iPhone that's sitting on a desk or music stand (or an iPad using the company's iKlip, iPad stand adapter). The cable is a bit long for a handheld interview mic. One of two things tends to happen in that case: The user



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trips over the cable or, more likely, the cable gets wrapped up in a little ball and hangs awkwardly. Also, since it's a fixed-length cable it's not possible to add cable so the mic can be left on a podium (or near the morning show stunt) leaving the iPhone and app at a safe distance.

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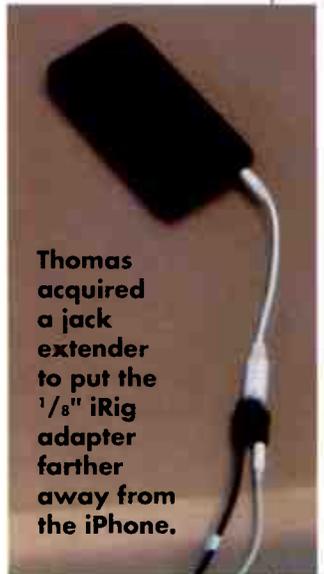
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One feature is the level switch on the side of the mic. It sits where the on-off switch would normally sit and has three positions: I, II, and III. The switch works actually in reverse as you think it might because the icons denote mic sensitivity as opposed to mic gain. What would seem to be the lowest setting is actually the opposite – the most sensitive. I noticed in

one Web review the author assumed his unit had a manufacturing defect. It takes getting used to.

One final quirk was the 1/8" adapter. It's an integrated iPhone plug and headphone splitter/jack. This ends up being a fragile-looking lump of plastic and wires plugged right into the phone. In radio remote and interview applications, I can see this causing a ruined iPhone headphone jack within days. I immediately acquired a jack extender (see photo), which put the rigid adapter a few inches away from the iPhone and made it seem a little less risky.



Thomas acquired a jack extender to put the 1/8" iRig adapter farther away from the iPhone.

The iRig Guitar adapter incorporates this sort of extender so it's interesting that IK Multimedia didn't use the same technique on the iRig Mic. I suspect that, again, IK envisions the use of the iRig mic in desktop situations where the phone sits flat on a surface, not the hustle of radio remote broadcasting.

Quirks notwithstanding, the iRig Mic is a useful tool for getting good quality audio into the iPhone, iPad or iPod Touch. The attached cable design actually makes for a simple experience with fewer components to carry. A reporter could easily have this in a portfolio or briefcase and quickly attach/detach without a much hassle. The quality, directional pattern, and simple operation make this a very good way to improve field production using IOS devices. The price makes it so it's possible to have one or two spares on the shelf for the inevitable catastrophe. It's certainly worth your own evaluation and consideration.

Thomas is vice president of engineering for Lincoln Financial Media, Atlanta.

Editors note: Field Reports are an exclusive Radio magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company.

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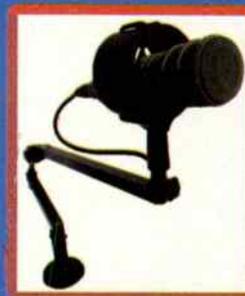
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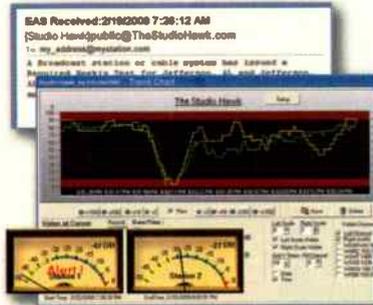


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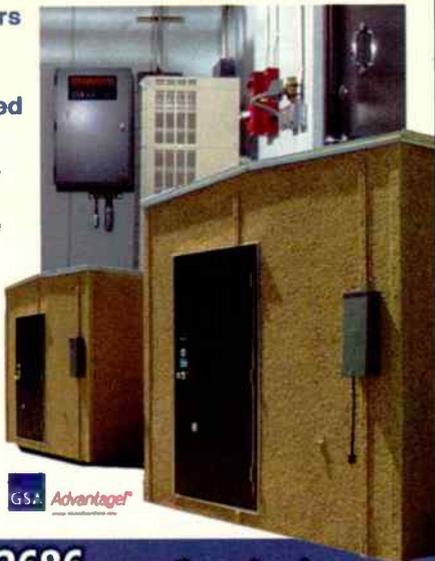
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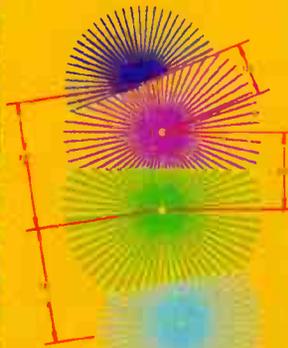
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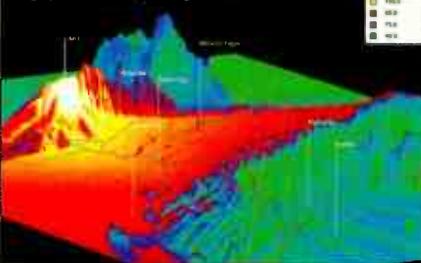
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Contributor Pro-file

Meet the professionals who write for **Radio** magazine.

This month: Facility Showcase, page 50.



Sam Lovato
Associate Professor
Colorado State University - Pueblo

Lovato received his BS from the University of Southern Colorado and his MA from the University of Northern Colorado. Lovato has taught electronic media courses since 1993 and has worked professionally for several radio stations.

He has been the Mass Communications Department's leader in digital audio production and radio station programming strategies, he advises students emphasizing in electronic media.

Lovato has been honored three times by the Broadcast Education Association for excellence in audio production. Sam's academic interests include radio and television programming, social media, FCC regulation, and global communication.

Lovato is the faculty advisor to Colorado State University - Pueblo's award-winning radio station Rev 89. His personal interests include music, collecting, and travel.



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Digital Alert Systems	40	585-765-1155	www.digitalalerts.com
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by Erin Shipps, associate editor

Sample and Hold Radio listenership

Arbitron released cumulative audience estimates for the 56 RADAR-rated networks. RADAR 108 estimates illustrate network radio's continued strong listener base. Compared to the Arbitron estimates

from one year ago, network radio increased its weekly reach among persons aged 12 and older by more than 3.5 million listeners.

Source: Arbitron

Demographic	RADAR 104 (March 2010)		RADAR 108 (March 2011)		Change (000)
	Reach (000)	Reach rating	Reach (000)	Reach rating	
Persons 12+	189,550	73.7	193,143	74.4	3,593
Adults 18+	172,385	74.1	175,487	74.8	3,102
Adults 35+	119,399	73.8	121,038	73.9	1,639
Adults 18-49	102,834	76.1	104,483	77.4	1,649
Adults 25-54	97,086	76.6	98,491	77.6	1,405

Public radio listeners' media usage

The results of a national Web poll survey, conducted in partnership between Jacobs Media and the Public Radio Program Directors Association (PRPD), consisting of more than 21,000 respondents from more than 40 public radio stations across the United States shows an impressive trend of media usage and gadget acquisition from texting to ownership of eReaders and iPad. Some key findings include:

Public radio listeners have to be the best educated on the planet. Eight in 10 have a college degree. And nearly half hold a graduate degree.

More than one-third of PRTS3 respondents now own a smartphone, up 29 percent from last year's study.

Pandora makes its first ever appearance in this study. One-fourth of public radio survey takers listen to Pandora monthly or more.

In the past year, six of every 10 PRTS3 respondents say they have downloaded and listened to a podcast.

Internet radio streaming shows impressive gains. Four in 10 PRTS3 participants listen to streaming audio at least weekly, up 17 percent from last year's survey.

Last year's big headline was about social media. And while momentum has slowed, nearly two-thirds of PRTS3 respondents now have a profile. Facebook and LinkedIn are the big gainers, while MySpace's share has actually decreased.

Texting continues to grow, even among Classical music fans. Among the total sample, more than four in 10 participants text weekly or more.

Finally, HD Radio ownership continues to rise. Overall, 6 percent say they have an HD Radio, up 22 percent from last year. On the other hand, satellite radio has plateaued at 13 percent, similar to PRTS2 levels.



Source: Jacobs Media Public Radio Tech Survey 3

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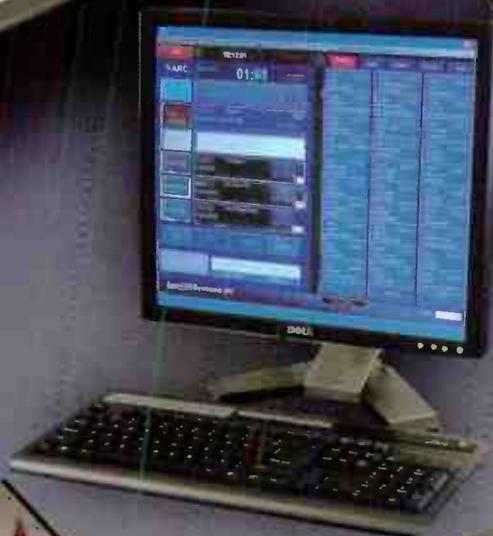
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SOUND:REAL

“With the AirAura, THUNDER sounds more thunderous...”

It's not often that management and engineering are in total agreement. It's even more unusual when the top dog is a CPA who is the GM AND the CFO. That's Richard T. Morena, Principal of Press Communications, LLC. He and George M. Kowal, his Assistant Chief Engineer, see eye to eye (or ear to ear) when it comes to their on-air sound. Press Communications, LLC is located in Arbitron Market #51 and broadcasts on the simulcast 106.3FM/106.5FM (THUNDER 106) from Atlantic City to NYC. That's why they've got a pair of Vorsis AirAura processors taking care of business at THUNDER 106.

“Sure, WE can hear the difference immediately. But when our LISTENERS call to tell us how great we sound, we know we're onto something big. With the AirAura, THUNDER sounds more thunderous and THAT is something that really shakes up our bottom line,” says Richard Morena. “We LIKE that!”



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