Radio®
THE RADIO TECHNOLOGY LEADER
June 2008
RadioMagOnline.com

NAB Show

A Review

2008 PICK HIT

CODECS

The Session Initiation Protocol

FIELD REPORT

KLZ Audiofile & Audio Compass 1.0

A Penton Media Publication

E² Ethernet Audio Done Right

MEET THE SQUARE

The Wheatstone E² (E SQUARE) gives you the convenience of Ethernet audio without all the IP hassle. It just *knows*. The built-in Setup Wizard lets you configure an entire system with just your browser and a laptop. Unplug it when you're done and there's no PC between you and system reliability.

SQUAREs are **totally scalable**: use one as a standalone 8x8 studio or transmitter site router, with browser access from anywhere. Plug two together and have a standalone digital snake. Add a fanfree mix engine and build yourself a studio using analog and digital I/O SQUAREs.

All the power is *in* the SQUARE. Distributed intelligence replicates all configuration data to every unit. Profanity delay and silence detection are done *in* the SQUARE. Even virtual mixing (w/automation protocol) —it's *in* there; all with real front panel meters, 32 character status indicators and SNMP capability.

88E DIGITAL ENGINE: Just plug an E-SERIES control surface or GLASS E computer interface into this engine and get all the mixes, mic and signal processing you need. Fanfree, so it can stay in the studio where it belongs.

Because the E² system doesn't rely on a third party GUI, tech support is straightforward (and 24/7). Likewise, system operation doesn't require external PCs for continued full functionality. Best of all, 1 Gigabyte protocol eliminates the latency and channel capacity restrictions associated with older technology.

E-SQUARE is Ethernet audio done RIGHT!

88D I/O: 8 digital inputs and outputs. You can headphone monitor and meter any of the SQUARE's inputs or outputs in real time. The 32 character display gives you all the information you need about your audio and system configuration. And because you can operate in either 8-channel stereo or 16-channel mono mode, 16 channels of metering are provided.

88A I/O: 8 analog inputs and outputs. You can bring a new SQUARE up in seconds and of course use the front panel encoder for your X-Y control. Front panel status LEDs give you continuous link, status, and bit rate information as well as confirmation of any GPIO activation.

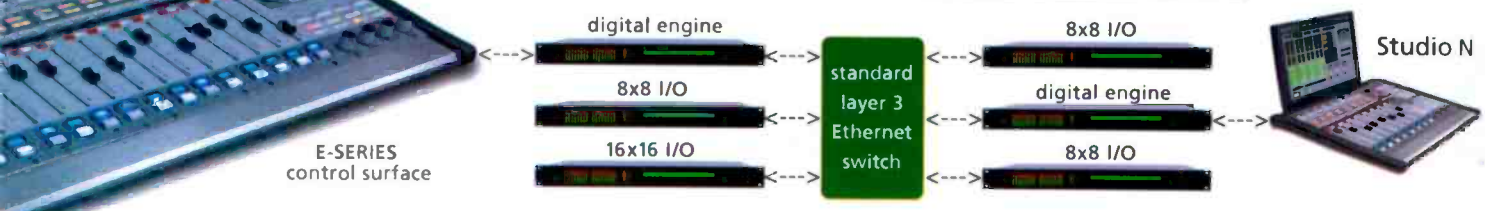
88AD I/O: 4 analog plus 4 digital inputs and outputs—perfect for small studios or standalone routing.

88 I/O CONNECTIONS: E² has both DB-25s for punchblock interface and RJ-45s for point-to-point interface. All SQUAREs have 12 individually configurable opto-isolated logic ports that can be either inputs or outputs.

Studio 1

E-SERIES control surface

STUDIOS DONE EASY!



www.wheatstone.com

Wheatstone

Quality. Convenience. Comfort.

Audio-Technica's line of broadcast quality headphones provide exceptional clarity and sonic accuracy with high power handling. The closed-back cushioned earcup design creates and oustanding seal for maximum isolation while keeping distortion low. Units are collapsable, making portability and storage easy. Adjustable cushioned headbands and lightweight design allows for maximum comfort.

"...the most exciting (headphones) to come along in years..."
Frank Filipetti — GRAMMY®-winning mixer & producer

"A-T has raised the bar once again..."
George Massenburg — GRAMMY®-winning engineer & producer

ATH-M40
Precision Studiophones

ATH-M30
Closed-back Dynamic
Stereo Monitor Headphones

ATH-M50
Professional Studio Monitor Headphones

Serving broadcasters for over 30 years - Call your sales professional for the best price in broadcast gear.

audio-technica.
always listening.

FULL COMPASS
PRO AUDIO | VIDEO | AV | LIGHTING
FULLCOMPASS.COM | 800.356.5844

CONTENTS

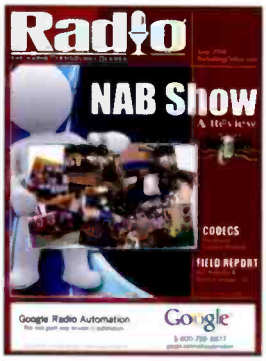
14

36

50

ON THE COVER

Coverage of the 2008 NAB Show in Las Vegas takes the stage in this issue. Check out Pick Hits, more new products and photos from the convention! Cover design by Michael J. Knust.



Features

Columns

Departments

Thousands

of people across America use Tieline codecs for remote broadcasts every day.

"The broadcast was wonderful - Tieline's wireless 3G provided all the benefits of a remote pickup unit with bidirectional audio paths, and a communications circuit."

Marcus Xenakis,
Director of Engineering and IT,
Clear Channel Radio in Philadelphia

Watch a live wireless video demo right now
www.tieline.com/videos

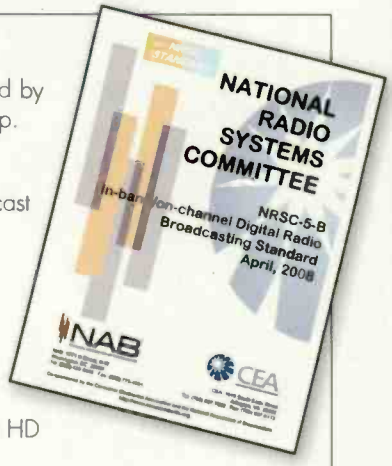
Tieline®
www.tieline.com

800-950-0750

CONTENTS ONLINE

Currents Online

Selected headlines from the past month.



NRSC-5 Update Published

NRSC-5-B, the In-band/on-channel Digital Radio Broadcasting Standard, was adopted by the Digital Radio Broadcast Subcommittee at the April 12, 2008, meeting of the group.

SBE Launches SBE Internships Online

The site offers students interested in broadcast engineering a way to search for broadcast engineering internships.

Elettronika Signs HD Radio License Agreement

The company is part of a slowly growing list of international manufacturers entering agreements to manufacture the digital radio equipment.

Samsung Releases HD Radio Module

The new module provides a low-power consumption and small physical size for use in HD Radio products.

Airshift Updates Website

The company has also released evaluation versions of its Airshift Studio 2.1 and Airtime 2.0 software for Windows, Mac and Linux.

Debut Broadcasting Names Sutton as Corporate Chief

Bill Sutton's appointment is part of Debut's Super-Regional Cluster strategy.

Mexico Authorizes HD Radio Within 320km of U.S. Border

The move was made so that Mexican stations in that region can transmit at the same technological level as other Mexican stations.

Site Features

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.

Engineer's Notebook

The collection of tips and tricks continues to grow. There's room for more, so share your ideas today.

Advertiser Links

Want to know more about an advertiser? Access Web links to the advertisers in the June issue.

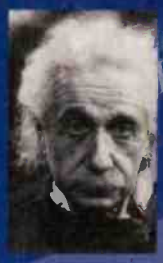
Industry Links

We have a list of schools, museums, associations and other sites that relate to radio broadcasting.

Industry Events

The *Radio* magazine Industry Events section lists upcoming conventions and conferences. Be sure to send us news of your upcoming event.

It doesn't take a genius to know that being off the air will cost you...



STACO ENERGY PRODUCTS CO.

Your tailored power solutions provider

Protect Your Revenue Stream with Tailored Power Quality Solutions from Staco Energy Products

For over ten years broadcasters have relied on Staco voltage regulators to keep their digital transmitters up and running. Now that proven reliability is available to protect your in-studio assets too!

Visit our web site—www.stacoenergy.com— to see our line-up of Uninterruptible Power Supplies, Harmonic Filters, and other power quality products and services. Talk to us about your application requirements—and we'll tailor a solution to keep you on the air—without breaking the bank.

UniStar P Series®

6, 8, and 10kVA on-line double conversion true sine wave UPS

- Systems are parallelable up to four (4) systems for either redundancy or capacity
- Tower and 19 inch rack configurations

Features:

- Simple hardwire i/o conect ons (6, 8, & 10 kVA units)
- User friendly control panel
- Precision power conditioning
- Smart battery management
- Remote communications and monitoring
- Optional external battery packs for extended runtime

FIRSTLINE®

10, 15, and 20kVA on-line double conversion true sine wave UPS

- 208, 220 or 480Vac operation at 60Hz

FIRSTLINE® OC

The most comprehensive and flexible power distribution solution available.

- Jp to 96 protected branch circuit breakers.
- Three interlocked switches for true wraparound bypass.

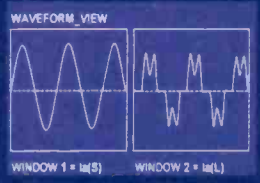
StacoSine®

Active harmonic Filter

- Available from 208-480Vac (600Vac consult factory)
- Wall mount and free standing models
- 50/60Hz

Features

- Parallelab e up to six (6) systems for added capacity or redundancy
- Full-funct on spectrum analyzer standard on all models
- Digital Signal Processor (DSP) controlled for extremely fast and accurate filtering
- Available in NEMA 3R and NEMA 12 style enclosures (consult factory)



Waveform after correction

Waveform before correction

Visit our web site:
www.stacoenergy.com

70 Years of Excellence
STACO ENERGY
1937 . 2007

ISO Certified 9001 : 2000

Staco Energy Products Co.
US Toll Free: 866-261-1191
Phone: 937-253-1191
e-mail: sales@StacoEnergy.com
www.StacoEnergy.com

Power Quality Solutions Tailored To Protect *Your* Revenue Stream

The next step in EAS

Between terrorism and natural disasters, attention to public warning has never been greater. The term public warning means different things to different people, but you're hard pressed to meet anyone who does not support the general idea of having an effective way to reach the masses when a crisis occurs.

The FCC has an open rulemaking to update one aspect of public warning: the Emergency Alert System (EAS). The current EAS has been in use for more than 15 years, and by itself, it is an improvement over the EBS, but it still has shortcomings.

EAS from a government perspective was a way to transmit a message from the president to the public. States, regions and cities have adapted the system to fill other needs. Some have done it well. Some have not done it at all. The government has also not given its full support of EAS.

Now that the FCC has opened the topic for discussion, the SBE, NAB, National Alliance of State Broadcast Associations (NASBA) and FEMA are working to decide where to go to develop the next generation of EAS.

In May, the Homeland Security Emergency Communications, Preparedness and Response Subcommittee, of the House Committee on Homeland Security, held a hearing for an update on FEMA's progress on updating the public warning system. Also in May, the FCC held a summit to discuss the current state and future of EAS. Both events highlighted past and current shortcomings. Both presented ideas on the future of EAS. Neither has shown where EAS is really going.

One element that will be included in an EAS update is the Common Alerting Protocol (CAP), as the FCC order mandates. Simply put, CAP provides a better way to encode data about an emergency for dissemination to the public. CAP can include images and more descriptive text to better inform recipients about a plan of action.

With all this said, I keep hearing that it's too soon to tell what the next generation of EAS will look like. In some ways, I understand that. There are lots of ideas being shared and solutions to current problems being proposed, but there are not yet any firm goals being presented to accomplish this improved EAS.

One important point to keep in mind is that EAS is part of public warning. EAS is not the only form of public warning. Broadcasters should focus on their own role in public warning and let others determine how the other aspects will function and interact. This is one area where I see progress being thwarted. The grand plan is good to keep in mind, but broadcasters must focus on their own piece of the project.

Many broadcast engineers seem to have taken personal ownership of EAS. This is ironic, because most broadcast licensees have not. Many licensees see EAS as a requirement. They understand their responsibility to the public, but they want to provide warnings with the minimum intrusion to their business operations. If the engineers push a system through without the licensees taking an interest, any proposed improvement will still be met with resistance.

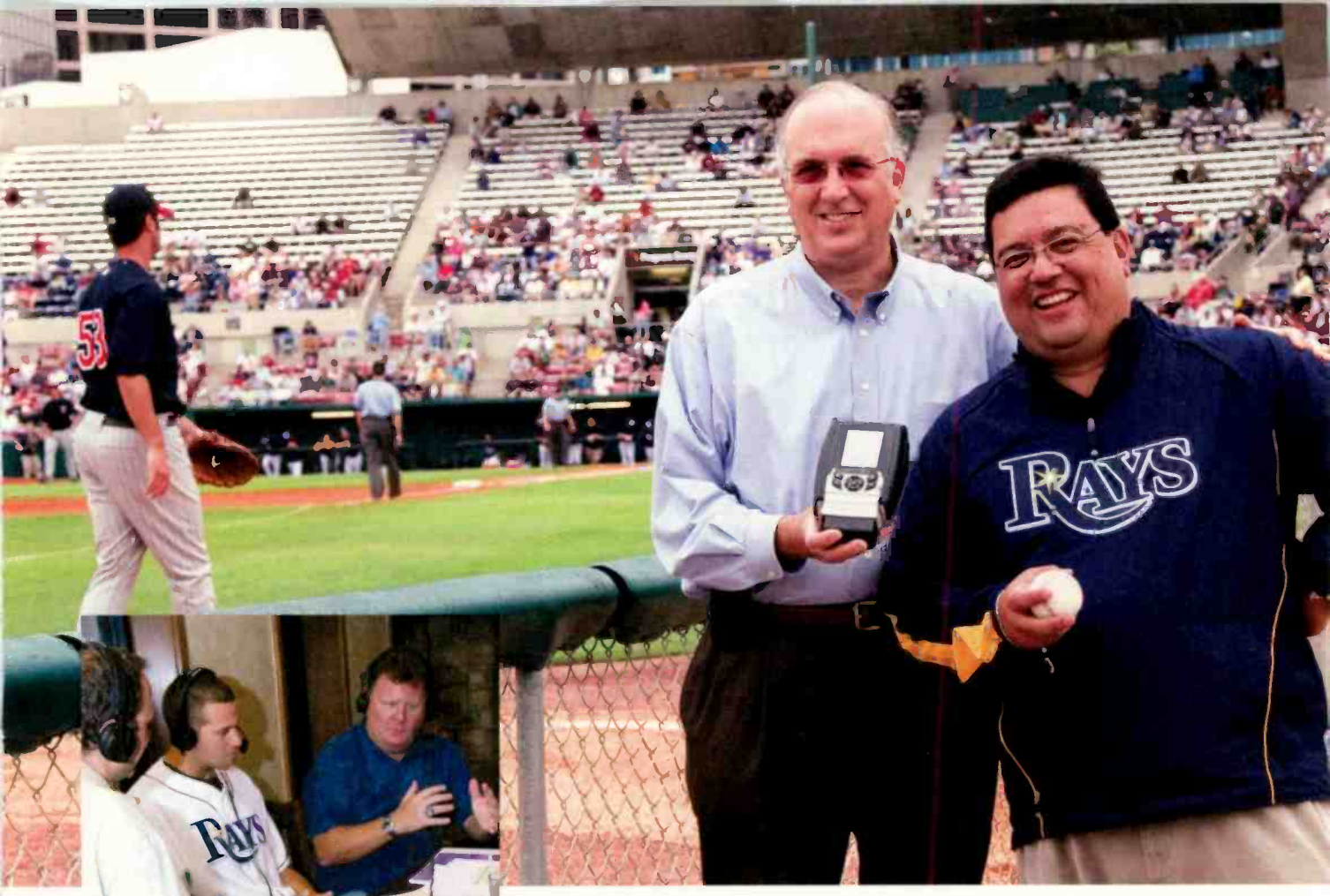
For the owners, this hands-off approach will yield a system they don't like. Many engineers argue that because the engineer has to make it work in the end, the engineers should design the system. This automatically puts the engineering side against the owners and managers.

Not to oversimplify, but if the owners don't care, then why should the engineers?

With the NAB and NASBA involved, there is a conduit to the owners. I have not seen any activity from the owners through these groups yet. It is my hope that the NAB's and NASBA's efforts will be recognized and acted upon. This will result in an improved EAS, not just a replacement.

Chris Scherer

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



*Above: Rays broadcasters **Andy Freed** (left) and **Dave Wills** (right) interview Rays' star third base prospect **Evan Langoria** on the "The Hot Stove Radio Show."*

*Top: **Larry McCabe**, Tampa Bay Rays Senior Director of Broadcasting and **Rich Herrera**, broadcaster and Director of Radio Operations are shown on the field during spring training.*

Impossible Remote?
Nah...You've Got ACCESS!

Tampa Bay Rays' Real-World Super Hero Saves the Day!

Fans of the Tampa Bay Rays baseball team are intimately familiar with Dave Wills and Andy Freed, play-by-play announcers and hosts of "The Hot Stove Radio Show." Offering the inside track on all things Rays, the show kicked off its 2008 season with the "Countdown to Opening Day" series. While at a remote from a well-known sports bar, ACCESS showed its true worth. Two minutes before the broadcast, the ISDN line that was supposed to be used for the broadcast failed to connect. Luckily, they had the ACCESS running on Wi-Fi provided by the restaurant. The broadcast got on the air and was flawless for the entire one hour show.

ACCESS delivers mono or stereo over DSL, Cable, Wi-Fi, 3G cellular, satellite, POTS (yep, ACCESS is a full featured POTS codec and works seamlessly with Matrix, Vector and Bluebox)—plus some services you may not have even heard of. Given the challenges of the public Internet, it's no small boast to say that ACCESS will perform in real time over most available IP connections.

Contact Comrex today and find out how ACCESS can help you become a Real-World Super Hero — wherever you are!

NEW from COMREX:

BRICTS TRAVERSAL SERVER & **AAC-ELD** Software from Fraunhofer IIS

Two new options to enhance your ACCESS:

BRIC Traversal Server makes IP connections a snap by automatically syncing with your buddy list.

The **AAC-ELD** option offers exceptionally high quality, low latency audio. Contact Comrex for more info!

Put Comrex On The Line.

COMREX

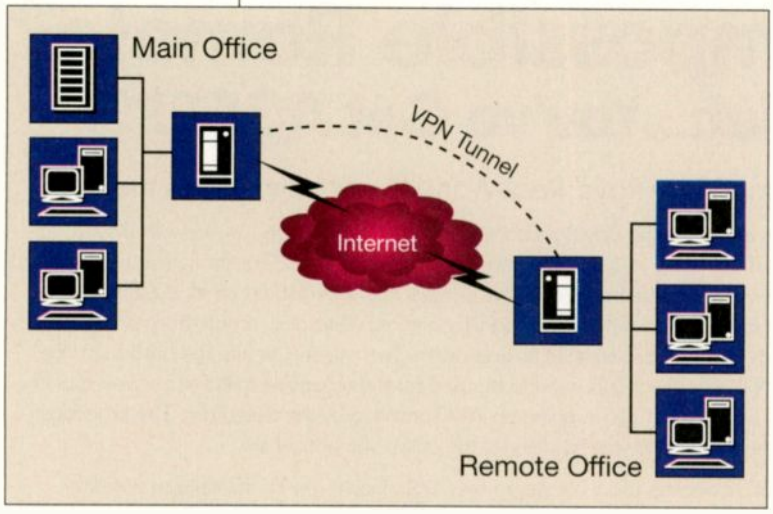
19 Pine Road, Devens, MA 01434 USA Tel: 978-784-1776 • Fax: 978-784-1717 • Toll Free: 800-237-1776 • www.comrex.com • e-mail: info@comrex.com

Applications for IP tunneling

By Kevin McNamara, CNE

The problem: You need to provide full network access to your crew working at a remote location. Not just the kind of access that allows e-mail or to grab some files from the server, but direct access to the automation, news systems, remote audio feed and call screening. Sure, most of these can be provided through more traditional routes, but wouldn't it be easier to just give the remote users a secure direct connection to the station network? The answer to this is in IP tunneling. A connection established through the IP tunnel is similar to plugging a PC into the network connection at the station. Pretty nice, huh? IP tunnels can operate through any type of wired or wireless network. The document that specifies how IP tunneling works is called RFC2003.

The most common application for IP tunneling is the virtual private network (VPN), which many engineers use regularly to access the company networks when not in the office. Also, if you need to get around a company firewall or feel the need to do some anonymous Web surfing, this is your answer.



VPN can be used to create a secure connection between remote and static locations.

The best part of this is that IP tunneling can be implemented for virtually no cost with the many freeware programs that can be downloaded off the Net. In fact, most operating systems already have the necessary software included.

Virtual private networks

The VPN provides a private and secure connection between a remote user and a network over a public network. VPNs can be created through a standard Internet connection or, in some cases, a private WAN. A VPN is designed to work exclusively over IP; however, it will transport other protocols such as NetBEUI and IPX. In reality, the concept behind the VPN has been around for several years, known as IP tunneling. The principle behind IP tunneling is fairly simple: Data is encapsulated within IP packets and can be secured using data encryption and authentication methods.

Originally, the VPN was based on either *Point-to-Point Tunneling Protocol* (PPTP) developed by Microsoft for PC-to-LAN connections or *Layer 2 Forwarding* protocol (L2F) developed by Cisco to support LAN-to-LAN communications. Currently, the features of both protocols are combined into a standard known as *Layer 2 Tunneling Protocol* (L2TP). L2TP supports multiple simultaneous tunnel connections. Other VPN protocols include *IP Security* (IPSec), a technology developed for firewalls and designed to support the secure transmission of only IP packets; and SOCKS5, which provides a higher level of control, but requires special software running on an independent server and at the client PC location.

IP tunneling

There are essentially three protocols that can deliver IP tunneling.

L2TP was created from the best of two previous specifications from Microsoft's Point-to-Point Protocol (PPP) and Cisco's Layer 2 Forwarding (L2F) protocol. It has a deceiving name since it mimics a network (2) layer, but actually works at the Session (5) Layer. It works by encapsulating the full L2TP packet and header information and transports it over a User Datagram Protocol (UDP) as opposed to the Transport Control Protocol (TCP). It is one of the more common protocols due to the popularity of Cisco products found in most corporate networks. Chances are if you have VPN access, you're using the Cisco VPN client software to gain access.

You might recall one of the major differences between UDP and TCP is the fact that UDP is considered an unreliable protocol, which means the packets are broadcast without confirmation that they were received at the other end. TCP is considered reliable since the packets are confirmed they are received or the source resends until completed successfully.

Security is also an issue with L2TP, so it is typically combined with IPSec to achieve adequate encryption; this is also known as L2TP/IPSec.

In order to execute a L2TP session, two endpoints must be established: the L2TP Access Concentrator (LAC) and the L2TP Network Server (LNS).

L2TP defines four tunneling modes:

- Voluntary – Initiated by the user
- Compulsory tunnel (incoming call) – Typically used for most corporate remote VPN connections
- Compulsory tunnel (remote dial) – Initiated from the server
- L2TP multi-hop connection – Used for routing L2TP connections between multiple LNS and clients

PPTP has been essentially replaced by L2TP and IPSec, but is worthy of mention because PPTP clients are found in all current versions of Microsoft operating systems.

PPTP works by encapsulating the PPP packet with the Generic Routing Encapsulation (GRE) protocol. Security can be provided through Microsoft's Point-to-Point Encryption (MPPE) for VPN applications.

IPSec consists of protocols that define a method to secure IP packets through encryption and decryption. IPSec operates at the network layer (2) in one of two modes – transport and tunneling.

In transport mode only the data portion of the stream is encoded; the routing and control information is left intact. This mode is preferred for host-to-host connections.

In tunneling mode, the entire data packet is encapsulated. This is used for creating a VPN to connect networks or client computers to a network.

IPSec also provides an integrity check, which ensures that no data packets are added, removed or modified. Public encryption keys are used to validate security information.

Implementing IP tunnels

Setting up an IP tunnel is a fairly easy and inexpensive task with the myriad of free software found on the Web, but you may already have the proper software included with your operating system. Current Microsoft, Apple and Linux versions should include (or have available for download) the necessary modules that will permit the creation of an IP tunnel. A simple search on the Web will provide a wealth of information that will allow you to load and configure the host and client side of the tunnel. In my search I found a very informative Web page from SeattleWireless.net that describes it well.

On the network server end, the host software could be loaded on your server, but I would recommend dedicating a separate network connected PC to act as the access point for the IP tunneling processing. This will also make it easier to set security levels for users accessing the network. This is an ideal application for an older machine running Linux.

If you have to bypass a company firewall, freeware programs such as IP Tunnel v1.0 from Feneris Solutions make the job easy and intuitive.

I think you can see the possibilities. IP tunneling goes beyond traditional office applications. It will permit a wide range of applications including expanded remote capabilities, setting up emergency back-up solutions any place you need to create a reliable, secure connection.

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

Resources

RFC2003 standard
www.ietf.org/rfc/rfc2003.txt

SeattleWireless.net article
www.seattlewireless.net/IpTunnel

Feneris Solutions
www.feneris.com

FCC rejects
NCE TV-6 waiver requests

By Harry Martin

The FCC is now dismissing applications submitted in the October 2007 NCE filing window (or just before the window opened) that depend on waiting out the elimination of analog channel 6 TV stations next February in connection with the DTV transition. The FCC's rules governing noncommercial educational stations require a special interference showing vis-à-vis nearby TV-6 stations due to the proximity of channel 6 (82-88MHz) to NCE-reserved band frequencies (88.5-91.9MHz). The issue arose when some NCE applicants, unable to meet interference standards imposed by the rules, instead asked for waivers based on the demise of analog TV-6.

An NCE station in Louisiana filed a minor change application in September 2007, seeking to improve facilities and gain cut-off protection from applications it anticipated would be filed during NCE window. The application acknowledged that its proposed change would not satisfy channel 6 protection requirements under the rules, but instead included a letter from its engineer to the nearby channel 6 station stating that the FM station would not begin operations until Channel 6 changed frequencies in connection with the DTV transition.

The Media Bureau determined the application was an impermissible contingent application and a rule waiver would not be in the public interest. Other similarly-situated applications have been dismissed on the same grounds.

The Louisiana station's approach to the channel 6 problem was not unreasonable. Congress has mandated that full-service analog TV operations must cease no later than Feb. 17, 2009, and, as part of the transition process, all but a few channel 6 stations will abandon that frequency and operate digitally on another channel. Moreover, given the facts that most of the NCE modification applications filed prior to and during the October window still have not been acted on (and the ones that are approved will have three years to build), actual interference to TV-6 stations is not an issue.

The FCC sees this differently. The agency ruled in the Louisiana case that acceptance of applications, whether for minor changes or new stations, where the applicants seek to take advantage of the abandonment next February of analog channel 6 operations, is fundamentally unfair. "Accepting this application – or any application that relies on a similar contingent consent agreement from a potentially impacted channel 6 station – could foreclose filing opportunities of other potential applicants and licensees that desire to file new station and modification applications based on the forthcoming vacation of analog channel 6 allotments but have deferred such filings based on the recognition that it is not presently possible to file rule-compliant proposals." The Commission noted that permitting such contingent applications filed in the October NCE window for new NCE stations would likely skew the fair distribution analysis in mutually exclusive groups. This would occur by allowing a noncompliant applicant to propose far more area and population coverage than competing applicants who tailored their coverage to the requirements of the TV-6 interference rule.

Martin is a past president of the Federal Communications Bar Association and a member of Fletcher, Heald & Hildreth, Arlington, VA. E-mail martin@fhhlaw.com.

Dateline

August 1 is the deadline for submission of biennial ownership reports by radio stations in Illinois and Wisconsin.

On August 1 radio stations with more than 10 full-time employees located in Illinois and Wisconsin must electronically file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC.

Also on or before August 1 radio stations licensed in the following states must place their annual EEO Reports in their public files: California, Illinois, North Carolina, South Carolina and Wisconsin.

expect MORE

NX50 AUI NV40

COOL STUFF AWARD
Radio World
2008

Radio

50kW AM

Advanced User Interface

44kW FM
Solid State

more **Engineers**
more **Innovation**
more **Award Winning Products**

nautel
902.823.2233
www.nautel.com/expectmore

The 2008 NAB Show

A Review

After months of planning, the 2008 NAB Show has come and gone. This year, the convention carried a reformatted name as the NAB Show. The tagline Where Content Comes to Life was also added, which stresses the focus on content creation that is a significant part of the Central and South Hall exhibits.

The North Hall included the radio/audio exhibits once again, which has become familiar territory for radio attendees. While the technology on display covered a wide range, digital radio was again the predominant theme. This covers not only the transmission aspect of HD Radio, but the digital elements of audio processing and routing, and data management and distribution. IP audio was also omnipresent. The technical sessions echoed these ideas as well.

Because of the size of the convention, it's likely you did not make it to every corner of the exhibits. That's where Radio magazine can help. Through our product wrap-up you can catch up on some of the items you missed. We also previewed a great number of products in our March and April issues, as well as in the NAB Insider e-mail newsletter. These are all available online at RadioMagOnline.com.

You'll also find the best summary of product introductions in the Radio magazine Pick Hits. First presented in 1985, the Pick Hits are the top 15 new products at the convention as chosen by a panel of radio broadcast engineers. We also tell you who the panelists are and give you the rules they followed to determine their choices. No other convention award does that, which shows the integrity of the Pick Hits.

And for a taste of the sights from the 2008 NAB Shows, look for selections from the Radio magazine Photo Blog, too.

We'll include more new products from the convention in upcoming issues of Radio magazine, including our annual Product Source, which is published in September.

2008 PICK HIT

Vector impedance analyzer
Array Solutions

Power Aim 120: The Power Aim 120 features high-resolution plots of all selected parameters, including R, X, SWR, reflection coefficient, return loss, load impedance magnitude and load impedance phase angle. A VSWR sideband ratio tool will quickly calculate the sideband VSWR ratio. Fast and accurate measurements allow for quick tune-ups and documentation via real-time PC data plotting over large ranges of frequency and impedance. Variable scaling of the frequency range and the parameter magnitude limits for clear data collection and read-outs both during a test session and afterward in off-line analysis. Fast sweeps and easy multiple plot and data point measurement saving for self-documentation and export to Microsoft Excel for further plotting and analysis. Data curve averaging and smoothing capabilities are available to reduce test measurement noise. A scan overlay feature provides rapid detection of system changes and the effects of adjustments, and a recycle mode offers continuous scan updates during adjustments.

Judges' Comments

Performs all the function of a network analyzer at a fraction of the cost.

It covers the AM and FM bands, so it's even more useful.

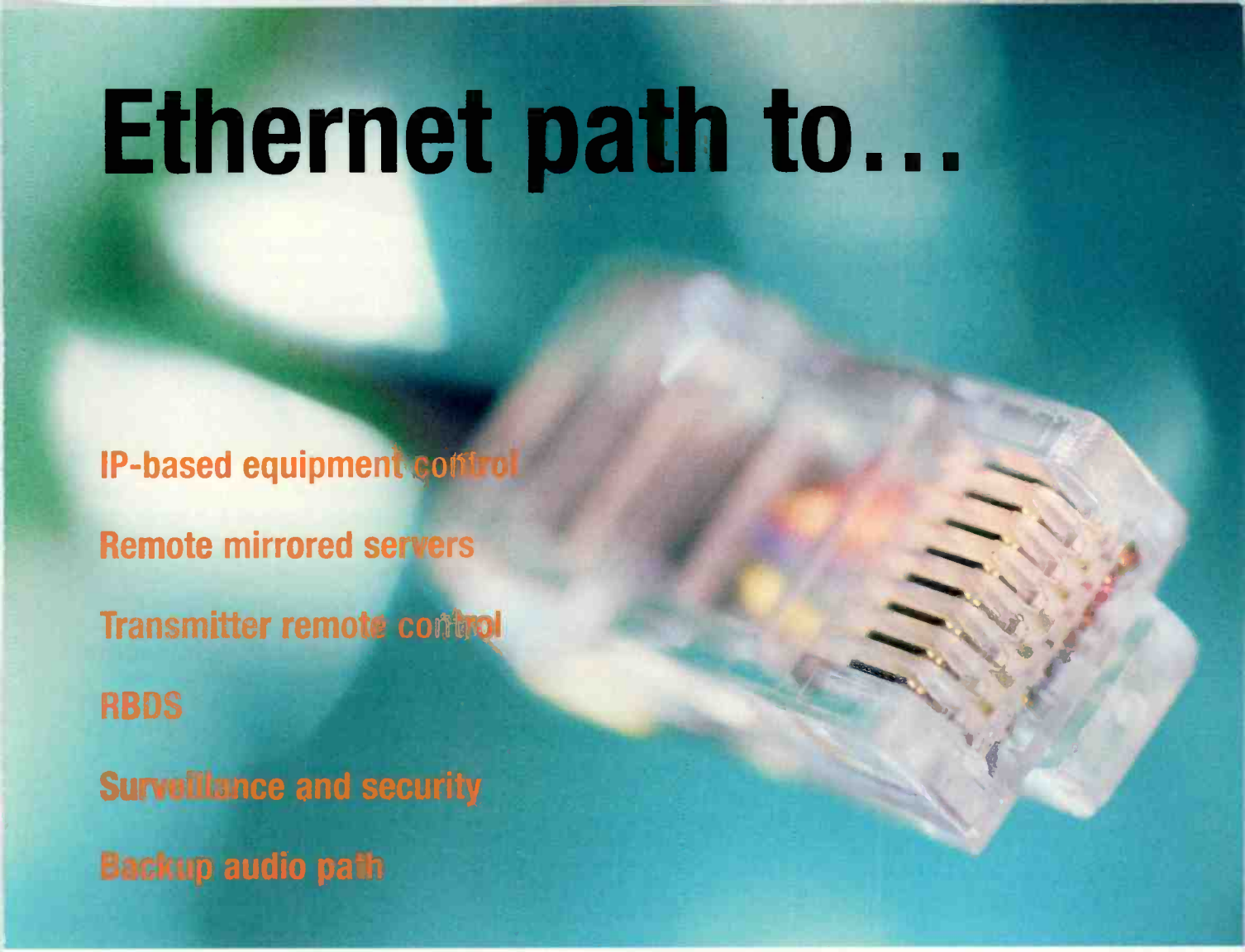
972-203-2008; www.arraysolutions.com
info@arraysolutions.com

Stats:

Registered attendance: 105,259
International attendance: 28,310 (record high)
News media attendance: 1,296

The 2009 NAB Show will be held April 17-23, 2009 in Las Vegas.

Ethernet path to...



IP-based equipment control

Remote mirrored servers

Transmitter remote control

RBDS

Surveillance and security

Backup audio path

...the transmitter site.

Innovative IP-based applications save money, save time and protect valuable station assets. But how to get IP connections at remote transmitter sites?

LanLink HS-900 provides IP Ethernet and RS-232 data where no wires or cables exist. And without licenses, leases or new antennas.

Ask the digital STL experts today.

Moseley

Dave Chancey 805.968.9621 Bill Gould 978.373.6303

www.moseleysb.com

The 2008 NAB Show
Pick Hits

Licensed RF STL
Radio Systems

IP-Connect/IPC 100: IP-Connect offers broadcasters new options for Ethernet-based, bi-directional, multichannel audio and broadband data connectivity for mission-critical transmission applications. IP-Connect's IPC-100 data link is the first in a new series of programmable, scalable and spectrally efficient 11, 18 and 23GHz band radios. These units are fully configurable due to their single-chip ASIC modem featuring integrated FEC with selectable coding rates allowing transport data rates from 8 to 32 T1s, 2xDS3, 50 to 250Mb/s Ethernet, or up to 2xSTM1 + 2xT1. Mixed data rates and formats can also be supported allowing the IPC-100 to act as a transparent data pipe for any network facility. Due to the IPC-100's frequency and bandwidth agility it offers licensed applications for program audio last-mile studio-to-transmitter links in the 18GHz band. Hardware configuration is implemented on the IDU/ODU design. Deployment of the IP-Connect IPC-100 is made via a single-run coax connection from the indoor unit to the outdoor unit/microwave antenna.

Judges' Comments

Licensing use for 18GHz makes this practical for long-time use.

Lots of IP and data capacity, and the modems are configurable.

856-467-8000; www.radiosystems.com; sales@radiosystems.com

Pick Hits Judges

Bud Aiello
Director of Engineering Technology
NPR – Washington, DC

Rodney Belizaire, CBRE
Chief Engineer
WQXR/NYT Radio, *New York Times*
New York, NY

Roswell Clark, CSRE CBNT MCSE
DTO, Cox Radio Tampa – Tampa, FL

Mike Cooney, CBRE
VP of Engineering, CTO
Beasley – Naples, FL

Scott Mason, CPBE
Director of Engineering
CBS Radio – Los Angeles, CA

Marshall Rice
Director of Engineering
Bonneville International – St. Louis, MO

Milford Smith
VP
Greater Media – Boston, MA

Martin Stabbert, CPBE
Director of Corporate Engineering
Citadel Broadcasting – Reno, NV

Dave Supplee
Regional Engineer
Cumulus – Harrisburg, PA

Barry Thomas, CPBE CBNT
VP of Engineering
Lincoln Financial Media – Atlanta, GA

All-in-one FM transmitter
Audemat/Ecreso

Digiplexer246/Next FM: The Digiplexer246/Next FM is the first all-in-one FM transmitter that includes digital audio processors, a stereo encoder plus additional innovative features such as an RDS encoder, embedded audio backup, I/O remote control and TCP/IP connectivity. Ecreso's engineers have partnered with the Sound4 audio gurus to incorporate a high quality audio processor that is based on a powerful DSP hardware platform. The Digiplexer246/Next FM operates at a sampling frequency of 192kHz for the main audio processing and 1.5MHz for the final limiter.

Judges' Comments

The built-in 80GB hard drive will fill lots of needs.

With everything built-in, it's a Swiss Army knife of transmitter devices.

305-249-3110; www.audemat.com; contact@audemat.com

Ethernet audio system
Wheatstone

E2: The E2 System is designed to interface with Wheatstone's existing line of E-Series control surfaces including the new Evolution 4 control surface. The flexible E2 system is comprised of linkable units or squares that communicate with one another via a single CAT-5E/6 cable connected to standard layer 3 Ethernet switches. The E2 Digital Engine handles all of the mixes from the E-Series surfaces while housing the DSP power and managing the distribution of PGM, AUX, and mix-minus buses throughout the system. 12 Universal Logic ports are encased in the single rack unit which is equipped with front-panel access to real-time control features such as IP setting, up time, network traffic and logic status. Web/PC software user interfaces provide remote access and control.

Judges' Comments

It's another IP audio device, but it adds features and options that were not available before.

Splitting a stereo input into two mono inputs is a more efficient use of resources.

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

Test and Monitor AES Audio On the Go

ATI DIGITAL AUDIO Portable Digital Audio Monitor Model DM500

The **DM500** is both a Digital Audio Monitor and a Digital-to-Analog converter in a portable carry case. It accepts AES/EBU and S/PDIF digital audio formats from 27 through 96 kHz sample rates via XLR, BNC and RCA connectors. A 24-bit D/A converter feeds a powerful stereo headphone monitor amplifier, balanced analog line outputs and a stereo LED meter.

The DM500's display tells you everything you need to know about your digital audio signal including input level, sample rate, validity and errors. The stereo level meter can be switched to indicate either headroom below 0dBFS (the digital maximum output of the D/A) or the analog output level with 0dB midscale equal to +4dBm output. Analog display ballistics are PPM for optimum indication of audio peaks.

The DM500 is ideal for digital signal troubleshooting on the go, but is equally at home on the bench or in your rack. Audio loop-thru connectors let you insert the DM500 into your digital signal path, with switchable input termination also provided. The included battery clip keeps you going in the field, or you can use an available external 24VDC power supply for 24/7 operation.

If you work with digital audio, you need the DM500. To order yours, contact ATI or your authorized ATI Distributor.

DM500 Features and Benefits

- Displays level, sample rates to 96 kHz and digital faults
- Accepts AES3 and S/PDIF digital audio on XLR, BNC or RCA connectors
- Loop-thru outputs for in-line monitoring; switchable input termination
- Carry case with strap and battery power
- 24-bit D/A converter with headphone jack and balanced audio output
- Desktop and rack mounting with AC power available

www.atiaudio.com

Audio Technologies Inc. Toll Free 800-922-8001 ■ sales@atiaudio.com

The 2008 NAB Show Pick Hits

Multi-stream networked audio processor
Omnia Audio

Omnia.8X: With algorithms modeled after the Omnia.3net, this processor provides eight discrete three-band stereo audio processors in a single, networked box. Its architecture works ahead of any bit-reduced audio coder to reduce artifacts and improve the sound audio destined for HD Radio, Internet and satellite broadcasting. Use it to process headphone feeds where off-air monitoring is not possible; as multiband level control for remote codecs or on-air telephone systems; to process and send multiple audio streams from a single studio complex to multiple transmitter sites; or on-demand for in-studio musical performances or commercial production applications. The processor uses the Livewire standard over Ethernet.

216-241-3343; www.omniaaudio.com
info@omniaaudio.com

Judges' Comments

I can use this for multiple in-house headphone processing or online stream processing.

The configuration of variable-band processing makes this a flexible tool.

IN-STU power measurement
Bird Technologies Group

Transmitter Power Monitor: Bird Electronics' Transmitter Power Monitor's DB-9 output provides a linear DC voltage output from 0 to 4V allowing for a wide variety of interface options. Its in-line calibration capability allows for greater accuracy in a single application (with an accurate power reference) and the integrated non-directional coupler allows for spectral analysis of the signal in minimal space requirements. The TPM features coupling ports and accurate power measurement combined in the same unit. The TPM can be calibrated in-line and on site. This characteristic helps minimize downtime and optimize on-air time. In addition, a simplified interface allows for a high level of customization and integration.

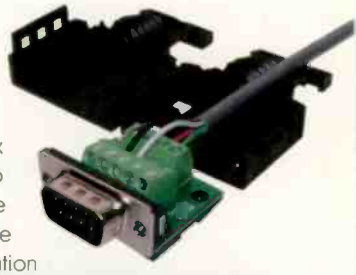
Judges' Comments

It costs less and has greater flexibility than previous monitoring sections.

The field calibration option is ideal for accurate readings.

866-695-4569; www.bird-technologies.com; sales@bird-technologies.com

Panel mounts
BTX



Max Blox: BTX's solderless connectors, the patent pending Max Blox EZ Termination System, feature rugged design allowing installers to terminate an HD15 or a DB-9 with just a screwdriver, and mount it in a panel, plate or Max Blox hood in a fraction of the time it would take to solder. When used with the Max Blox hood, these connectors simply slide, snap and lock without the use of tools. Optimized for use in any A/V application where VGA or RS-232 controls are used, the connectors are manufactured with genuine Phoenix Contact terminal blocks. The system accommodates wire diameters, from 0.120" to 0.500".

Judges' Comments

A DB connector to Phoenix is nice, but being able to add a real hood and strain relief is perfect.

I could keep a handful of these around for quick installations.

800-666-0996; www.btx.com; info@bi-tronics.com

2008 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 2008 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 2008 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.

rubicon

"WE HAVE TO BE EVERYWHERE AT ONCE. SAS MAKES IT HAPPEN."

"At Westwood One, thousands of radio stations count on us for a vast range of audio content—from music, to talk, to sports, to the latest news from CBS, NBC and CNN. We manage multiple studios in New York, LA, and DC. It's a big job. We have to be everywhere at once. That's why we work with SAS.

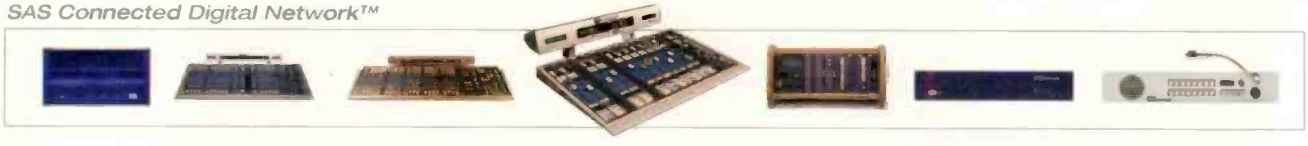
"SAS gives us a system that easily handles our complex audio and control demands, a system that integrates seamlessly with our computer content and satellite delivery systems. Their hardware is absolutely dependable, intuitive for our talent, and modular and scalable to handle our needs—for portable systems for the political conventions on up to core routing for our New York distribution and uplink facility.

"They are ready to develop products based on our needs and those of our partners, at a price that's fair and equitable. With SAS, no job has been too small or too big. Plus, their customer service has always been great and very reachable.

"We see that SAS faces the future with confidence, applying the right technology for the job of delivering content across multiple formats: terrestrial radio, satellite, IP, and web streaming.

"SAS lets us be everywhere at once. And stay that way."

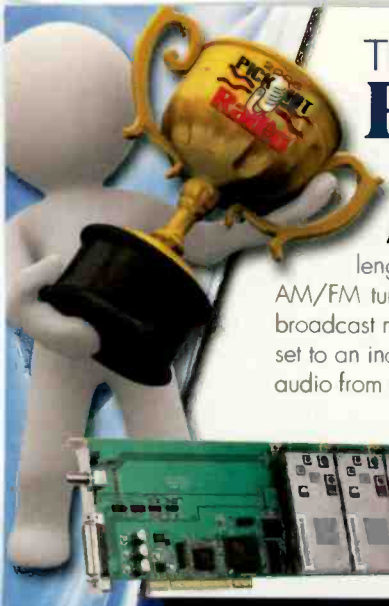
SAS Connected Digital Network™



1.818.840.6749 · radio@sasaudio.com · www.sasaudio.com

SAS SIERRA AUTOMATED SYSTEMS

Engineering great radio.®



The 2008 NAB Show Pick Hits

HD-Radio tuner card
Audio Science

ASI8914: The ASI8914 is a universal, full-length PCI card that contains four HD-Radio/AM/FM tuners and is designed for use in HD Radio broadcast monitoring and auditing. Each tuner may be set to an independent analog or HD Radio station. The audio from each tuner is presented to the computer host as a mono or stereo record stream accessed through a 32-bit PCI bus master interface. An F connector feeds RF signal from an external antenna to all tuners on the ASI8914. An HD50 connector makes available the mono or stereo line level audio of each tuner output. Recording formats include PCM, MPEG-1 layer2 and MP3. Each tuner can also decode and stream Program Associated Data and RDS/RDBS data for analog FM. HD Radio multicast is supported, allowing the audio and PAD stream to be switched between the Main Program Service and Secondary Program Services under software control.

Judges' Comments

The tuner card concept is good, but now it has HD Radio.

Lots of receivers in a tiny space; I need that.

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

AM reference receiver and modulation monitor
Inovonics

Model 525: The 525 is a frequency-agile, wideband AM-broadcast receiver that utilizes a highly linear phase-locked detector to provide accurate off-air measurements of AM carrier modulation. An important feature of this new monitor is the ability to resolve the amplitude-modulation component of the station's carrier during IBOC hybrid digital broadcast operation. Positive and negative carrier modulation is shown simultaneously on a high-resolution LCD display. This can be switched to provide a read-out of received signal strength and asynchronous noise as well, two parameters that can influence the modulation reading. Measurement response is flat to 10kHz, although a menu-controlled low-pass filter in the audio-monitor output provides a cutoff that can be programmed between 10kHz and 2kHz in 1kHz steps. This allows the user to preview the sonic compromises imposed by pre-transmission audio filtering and to simulate the response of consumer radios.

Judges' Comments

It's an analog monitor, but it works in the presence of IBOC signals.

The list of features is amazing.

FM transmitter
Nautel

NV40: The NV40 offers the highest single-cabinet power output of any FM transmitter available with a maximum analog power output of 44kW. For the first time, an HD Radio ready solid-state FM transmitter has been introduced that challenges the cost efficiency of tube-type HD Radio transmitters. It offers three modes of operation: Digital, hybrid and analog. The NV40 has an integral digital exciter that supports adaptive pre-correction, and offers a plug-in upgrade to the HD Radio Exgine. Nautel designed the product to occupy a footprint as much as 60 percent less than comparable solid-state and tube transmitters, provides advanced instrumentation and management tools, and optionally offers Nautel's new HD Power Boost technology for more IBOC power. The NV40's maximum power outputs are 44kW in analog mode, 32kW in hybrid mode and 12kW in digital mode.

Judges' Comments

It's about half the footprint of just about anything else.

It's hitting an affordable price point as well.

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

Stand-alone metadata appliance
Enco Systems

RAMA: RAMA meets metadata distribution needs in a small box. The completely solid-state disk-less hardware is noise-free and measures 7"x2"x4 1/2". Configuration and control are done through an easy-to-use browser interface. With two network connections it bridges the gap between the outside world and an automation network. Padapult is at the heart of RAMA and allows users to create and distribute now playing information along with compelling messagecasting content by sending real-time text data to an RBDS encoder, HD Radio Importers, a website and other destinations – up to 10 total. RAMA is the first metadata delivery appliance for radio stations and networks, distributing network PAD/PSD data to affiliates on a real-time or store and forward basis. RAMA is also a remotely administered metadata tool allowing configuration of local stations' data feeds from any location.

Judges' Comments

It's a metadata DA; we need that to feed multiple destinations.

Now we can actually feed some of our other streams with data.

800-362-6797; www.enco.com; sales@enco.com

MUSICAM USA

The World Leader in IP Codecs

Suprima

IP DUAL AUDIO CODEC

- Includes LAN, ISDN U & S/T, and X.21 interfaces standard
- Auto backup to ISDN from IP or X.21
- Built-in Web Browser for control and monitor from remote locations
- Comes fully loaded with every available algorithm included

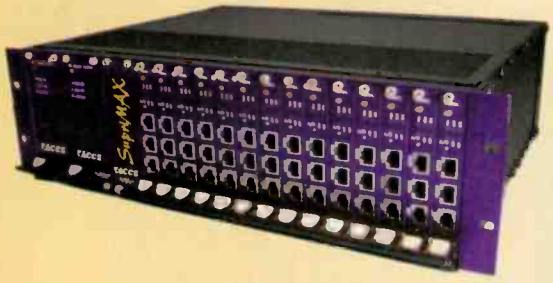
RoadWarrior

PORTABLE IP & ISDN CODEC

- Based on Suprima: Includes many of the same features
- 4-channel input mixer with line/mic levels and phantom power
- Lightweight & rugged design

SupriMAX

UP TO 14 IP AUDIO CODECS IN A 3U RACK



SupriMAX-1U

UP TO 4 IP AUDIO CODECS IN A 1U RACK

- ISDN/X.21 modules available for automatic back-up
- Each module is hot-swappable
- Redundant Power Supplies
- Fully loaded with every available algorithm included
- No additional components or options are required to meet your needs

CCS

MUSICAM USA

670 North Beers Street, Bldg. #4
Holmdel, NJ 07733 USA
732-739-5600
732-739-1818 fax
email: sales@musicamusa.com
web: www.musicamusa.com

The 2008 NAB Show Pick Hits

Remote power controller
Burk Technology

Plus-X AC-8: The Plus-X AC-8 provides independent management of equipment connected to 120V outlets, allowing remote rebooting of servers, PCs and more. Broadcasters can also remotely manage HVAC, lighting and other appliances. The product connects directly to the Burk ARC Plus remote control via Ethernet, or to any remote control (including the GSC3000 and ARC-16) using general-purpose inputs. A built-in Web server allows stand-alone remote connectivity.

Judges' Comments

It can stand alone, via the Web or work with any remote control.

Plenty of outlets for anything I would need.

800-255-8090; www.burk.com
sales@burk.com

Portable digital audio monitor
ATI Group

DM500: The DM500 is both a digital audio monitor and a D-to-A converter in a portable form factor. This unit features 96kHz digital inputs, a powerful headphone monitor amplifier, a weather-protected carrying case and alternate mounting configurations. It is designed by Day Sequerra in conjunction with ATI engineers. It comes with a battery clip and portable carry case with shoulder strap and weather protection. Other models are available for desktop or rack mounting, and the unit accepts external ac power supplies for 24/7 operation.

Judges' Comments

Lots of diagnostic power in a small package.

It has more capability than the previous test units I have seen.

800-922-8001; www.atiaudio.com
sales@atiaudio.com

USB broadcast console
Henry Engineering

Six Mix: Six Mix is a 10-input, 6-channel broadcast console that's about the size of a laptop computer. The most important feature is its integral USB digital audio interface. Connect a USB cable to any PC or laptop, and it's ready to record, edit and play digital audio. This makes Six Mix ideal for use with radio automation, digital production, news editing, webcasting, or as a self-contained emergency studio. Other features include a cue bus with cue speaker, monitor system with mic-on muting, a mix-minus output, and guest headphone facilities with full talkback.

Judges' Comments

Good set of features for use at remotes or a news desk.

The broadcast-friendly features make it easy for radio operators to use and understand.

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

PDM
25-Seven Systems

Program Delay Manager: 25-Seven Systems' Program Delay Manager (PDM) is available in both IP audio and standard digital/analog I/O configurations. PDM offers full protection against unwanted broadcast content while providing excellent audio performance and 25-Seven's unique PD Alert system. PD Alert enables the program director and/or other key personnel to receive e-mail notification that program material was blocked from airing, including an audio file containing the content deleted by Program Delay Manager. PD Alert eliminates second-guessing about what was and was not aired during the incident.

Judges' Comments

The e-mail notifications are a great feature.

Setup and configuration are easy and flexible.

888-257-2578; www.25-seven.com
info@25-seven.com

The 2008 NAB Show New Products

Stereo Profanity Delay
Sonifex

RB-PD2: The Redbox RB-PD2 is a stereo audio profanity delay used for live broadcast programs to prevent unwanted or obscene material from being transmitted. It features both analog and digital I/O and an automatic audio stretch algorithm that allows between two and 55 seconds of delay to be built up live on-air while maintaining the correct pitch. When the program is complete, the audio stretch algorithm seamlessly reduces the delay to zero. The delay can also be acquired while playing a preselected audio file on a Compact Flash memory card, and because playback from a Compact Flash card can be triggered remotely, the RB-PD2 can also be used at transmitter sites to play an emergency audio file via GPI in the event of silence detection.

207-773-2424; www.independentaudio.com; info@independentaudio.com

Microwave frequency searching tool
V-Soft Communications

Microwave Pro: Microwave Pro uses the FCC's ULS database to identify usable microwave frequencies and examine paths over terrain elevation plots while acknowledging interference to and from other microwave links. The program uses terrain-based analysis in conjunction with methodology found in TIA-EIA Telecommunications System Bulletin TSB10-F. When supplied with the parameters for a proposed path, Microwave Pro can quickly load all stations that have a potential interference relationship and calculate Carrier to Interference (C/I) ratios. A list of contact information for paths within the keyhole radius from the proposed path can be generated to be used in the prior notification process. Microwave-Pro also has a built-in link budget system analysis tool that can be used to generate complete link budget report. The wizard-based interface allows the user to enter path information, transmitter power, antenna gains, and other system gains and losses. The program will calculate the EIRP, path loss, fade margin and provide a minimum recommended fade margin.

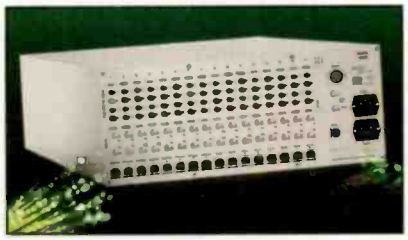
800-743-3684; www.v-soft.com; info@v-soft.com

Digital surround audio processor
Orban

Optimod 8585: Starting with the technology of Orban's Optimod 6300 two-channel processor for digital transmission media, the 8585 incorporates multichannel processing that reflects the latest psychoacoustic research into loudness perception. The 8585 features Optimod-quality two- and five-band audio processing for surround sound broadcasting, netcasting and mastering. Thanks to versatile compression ratio controls and a mastering-quality look-ahead peak limiter, the 8585 is ideal for mastering audio in broadcast productions. The 8585 is built on Orban's flagship hardware platform. This features a GUI displayed on a quarter-VGA active matrix color LCD, making it easy to do all setup and adjustment from the 8585's front panel. A new third-generation CBS Loudness Controller helps retain audiences by controlling both subjective loudness and annoyance. The multichannel and 2.0 processors can operate with separate audio processing parameters like release times.

480-403-8300; www.orban.com; sales@orban.com

Audio router
Klotz Digital



Venice: Designed for complex applications where an enormous number of channels need to be routed and a comprehensive router system is required, Venice offers a capacity of up to 2624x2624 channels. An almost unlimited router size can be achieved by cascading multiple Venice units. It offers full implementation and support of optical and coax MADI standard protocols as well as Klotz Digital's Vadis fibre optic network. The unique Studionet Octo-Bus is also supported as well as the new and future-proof IT standard for audio platforms: Ethernet AV. All principal functions are controlled via LEDs, status display and an Ethernet port, allowing Venice to be fully integrated into Klotz Digital's Vadis control network. In addition to Octo-Bus and Vadis, Venice is compatible to all other Klotz Digital components, such as Routing Control Panels, Vadis D.C.II and Decennium.

678-966-9900; www.klotzdigital.com
sales@klotzdigital.com

Audio and data multiplexer
AEQ

BC-2000 D Multiplexer: The BC-2000 D Multiplexer inserts and extracts digital or analog, mono or stereo audio channels in E1/T1/J1 or Ethernet data transmissions. The audio channels can be linear or compressed. The link capacities that are not used for audio can be employed for data transport. The BC-2000 D Multiplexer is a part of the BC-2000 D router digital audio platform that routes, mixes, processes and distributes audio. Other applications of the multiplexer are: studio to transmitter links (STL) and networks of transmission for radio with different simultaneous centers of production and emission.

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

Master clock time code generator
ESE

ES-160U: This crystal-based master clock/time code generator employs a temperature compensated crystal oscillator (TCXO), which provides the ES-160U with an accuracy of one second per month. Six 0.56" yellow LEDs display real-time while the unit simultaneously generates several types of time code. The ES-160U features ESE, SMPTE/EBU and ASCII time code outputs; one PPS (pulse-per-second) output; 12 or 24 hour display; automatic Daylight Saving Time correction; battery backup; external time sync input; and a 1RU enclosure.

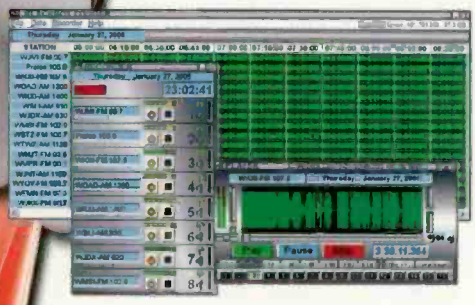
310-322-2136; www.ese-web.com
ESE@ese-web.com

The 2008 NAB Show

New Products

Digital audio logger
Pristine Systems

Blackbox Logger: This is a digital audio logger, monitor and alert system that is designed to meet compliance, proof, audit, programming, management and engineering needs. Up to 16 stereo (or 32 virtual mono) channels of logging are available. Choose from a variety of WAV audio devices, and AM, FM and TV tuner boards. Most popular audio storage formats are supported. Advanced tools provide the program director or consultant with everything needed for quick review or detailed analysis of the entire market. A virtual radio-style player allows switching between multiple stations during playback as though listening to a radio in real-time. Real-time monitoring of audio level and RF signal strength (when equipped with ASI tuner boards) with an extensive alarm system provides quick alerts to help avoid lost air time.



310-831-2234; www.pristinesys.com
sales@pristinesys.com

Radio console
Arrakis

ARC-15B: This powerful, general-purpose console meets the needs for most on-air radio and radio production studio applications. Channels one through five can be internally selected as either mic or stereo line channels. This is ideal for talk studio applications. Channel 15 is an advanced telephone interface to an external hybrid for live callers or an off-line contest call. Channel 14 can be configured with a Windows PC USB interface for use with live on-air, automation and production software. This console includes two stereo program output mixes, 15 input source channels, optional 16x3 out stereo remote select switcher, real VU meters for low fatigue monitoring during a long board shift, headphone system with stereo amp, cue-talkback system with built-in amplifier and speaker, and it provides monitor audio and logic for a studio/announce booth.

970-461-0730; www.arrakis-systems.com
sales@arrakis-systems.com

Modular enclosures and racks
Belden

Broadcast Enclosures: Belden broadcast, A/V enclosures and racks are an extension to its line of IT networking enclosures. Belden enclosures are engineered for maximum flexibility in configuring systems that meet unique application requirements while, at the same time, facilitating cable installation and management. Belden enclosures and racks are well-suited to support infrastructures for structured cabling systems, copper or optical fiber cable and connectivity systems and wireless LAN systems. To assist users in configuring and ordering a system to fit their size, space and component storage requirements, Belden offers a simplified ordering matrix as well as personalized service and support. The new series includes the Belden XSF and XMF Series, and the Belden XME and XMER Series.

800-BELDEN1; www.belden.com; info@belden.com

Intercom system
Clear-Com Systems

Venice: Version 5.0 of the Eclipse Digital Matrix intercom system acts as a central switching unit for communications across a broadcast operation. The system links Clear-Com V-Series panels and Cellcom wireless beltpacks and headsets for access to communication in the studio or in the field with more connectivity options. Working with an E-FIB card, fiber linking between Eclipse intercom matrixes of the Median and Omega classes enables large productions to tie their intercom systems together. Multiple Eclipse systems may then act as one non-blocking matrix using redundant high-capacity fiber, resulting in a large, high-quality, full-duplex communications system for mobile production and studio integration. An AES-6-RJ interface card allows the user to control remote V-Series Panels through AES3 stereo digital audio routers and consoles where the Eclipse intercom is required to talk over audio feeds.

510-496-6666; www.clearcom.com
sales@clearcom.com

Technology Spotlight

The NAB Show is the place to highlight new technology, and Ibiquity and four HD Radio equipment manufacturers took good advantage of the opportunity. As the HD Radio rollout continues, the technology evolves and improves.

One stumbling block for many stations has been the initial equipment costs. With that in mind, the NAB HD Radio Technology Advancement Task Force was charged with finding ways to decrease the hardware costs. Through its research, the task force determined that the HD Radio Exporter was one element that could be manufactured in a less expensive way. This device would also provide the most significant savings for the invested effort.

The HD Radio Exporter combines multicast audio channels and data services with a station's main audio channel into a format suitable for transmission. Until the NAB Show, the Exporter was rack-mount PC running specific software. The units were large and required a long start time when turned on. They were also prone to the typical problems of a PC running 24/7.

The solution was unveiled during the NAB Show at a press conference on April 13. Reducing the size and complexity of the Exporter into a solid-state device with embedded processing has also reduced the cost of the device. Some manufacturers say the total savings could be as much as $10,000. Further, the embedded Exporter includes the GPS receiver functions that were separate of the original Exporters.

The NAB says the project began in 2006. Because the NAB contributed to the development effort, NAB member stations are eligible additional discounts on new embedded Exporter products.

Announced during the 2008 NAB Show, creating the embedded Exporter was a joint effort of the NAB HD Radio Technology Advancement Task Force and Ibiquity, and included the participation of Broadcast Electronics, Continental, Harris and Nautel.

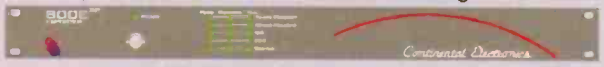
Broadcast Electronics XPI 10ESP

Can encode Arbitron Portable People Meter measurement of main and multicast channels.

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

Continental Electronics 800Exp

Can be paired with a Continental 802EX FM digital exciter using Continental's dedicated Exporter to Exgine network processor.



800-733-5011; www.contelec.com; sales@contelec.com

Nautel Exporter Plus

The system tolerates ac failures so an external UPS is not required.

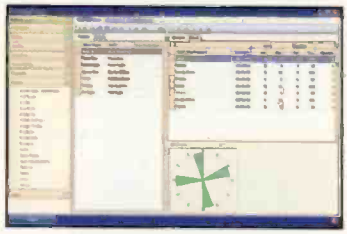
207-947-8200; www.nautel.com; info@nautel.com

Harris HDE-200

Has options for profanity delay, diversity delay and an Arbitron Portable People Meter encoding.

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

Traffic and business system
RCS



Aquira: Aquira is scalable from a single station to multi-station or multi-location broadcast groups. With a modern user interface, a user can open multiple logs at the same time and drag and drop spots from one log to another. Its report writing gives the user the power to create custom reports and save them with an easy-to-use Report Builder Tool. With Flexible Rate management, the user can maintain special control over each station. Powerful accounting functions generate a single invoice or send a group of invoices from a customized list at the click of a button.

914-428-4600; www.rcsworks.com
info@rcsworks.com

Portable recorder
Edirol

R-44: This compact, four-channel, solid-state field recorder uses SD or large capacity SDHC cards as the storage media. Capture up to four channels of uncompressed audio with selectable bit depths (16- or 24-bit) and sampling frequencies (44.1kHz/48kHz/88.2kHz/96kHz/192kHz). Onboard effects include limiter, low-cut filter, 3-band EQ, 6-band GEQ, Enhancer and de-esser. Weighing in at just less than 3 lbs, including batteries, the R-44 is very portable. Recording and monitoring without external devices is possible with built-in microphones and speakers.

360-594-4273; www.edirol.com
sales@edirol.com

SixMix does real radio on your laptop!

10 inputs, built-in USB, and real radio features!

only $1195!

www.henryeng.com

626.355.3656

We Build Solutions

HENRY ENGINEERING

New Products

Double coated-DTRS tapes
HHB

DA60DC and DA113DC: These double-coated DTRS tapes provide DTRS users with the latest metal particle tape formulation. First, a non-magnetic layer beneath the recording layer contains a lubricant that appreciably smoothes tape movement. Second, the tape substrate itself is designed to minimize friction during high-speed shuttling. Finally, the binder is specially formulated to minimize the shedding of the metal particle recording layer, even after repeated use over many years. Approved by Tascam for all DTRS recording applications, both the 60- and 113-minute tapes are packaged in professional library cases and come with labeling formatted specifically for professional audio use.

860-434-9190; www.hhb.co.uk; sales@hhbusa.com

Professional RBDS/RDS encoder
Deva Broadcast

Smart Gen 4.0: A full-function RDS encoder that conforms to European and U.S. standards for FM datacasting, this encoder transmits data in either block or safe scrolling modes and includes the TA function for traffic message priority override. It supports all service IDs and offers simultaneous scrolling-PS and Radio Text messaging. Two-way addressability includes a front-panel USB port for fast and easy static register programming of station and format IDs, and for entering default scrolling or static text. In full-dynamic operation, station automation communicates with direct RS-232 serial connection. Screen-entry Windows software makes programming the Smart Gen 4.0 simple. It operates with any FM exciter and stereo generator. A dedicated 19kHz sync source is not required, and a failsafe relay bypass is built in. It connects directly to all popular radio automation systems to scroll song titles and advertising.

+359 56 820027; www.devabroadcast.com
sales@devabroadcast.com

Audio toolbox
Broadcast Devices

ATB-300: The ATB-300 includes all of the long-asked-for functions in one convenient single rack unit box with simple, front-panel programmable functions a facility needs every day. Network feeds that are unbalanced, over/under driven, phase flipped, channel reversed, or incorrect mode can now all be fixed with the touch of a few buttons. The ATB-300 accepts analog and digital inputs to manipulate audio in the analog or digital domain quickly without the need to go off to the console first. There are countless other jobs the ATB-300 can do as a switcher, router and basic audio processing device. It allows switching between any two channels, mixing two or more channels together, turning channels on and off to create a mixer on the fly and switches to programmed sequence of channels upon failure of active channel with look back.

914-737-5032; www.broadcast-devices.com; sales@broadcast-devices.com

Facility supervision
Sealevel

RMS-1000: The RMS-1000 delivers IP-based communication, extensive I/O connectivity and fanless operation. The system is ideal for broadcast monitoring, security applications, IT infrastructure management and facility supervision applications. The RMS-1000 with optional Audemat Script Easy software provides an intuitive graphical user interface that requires no software programming skills. Users simply drag and drop logic functions to define condition parameters. The software automatically generates monitoring and control scripts that deliver status reports and alerts. Script Easy includes an embedded Web server that enables configuration and status monitoring from any Internet connection. Alarms can be sent via e-mail, SNMP and Voice/DTMF interface.

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

Audio processor
Vorsis

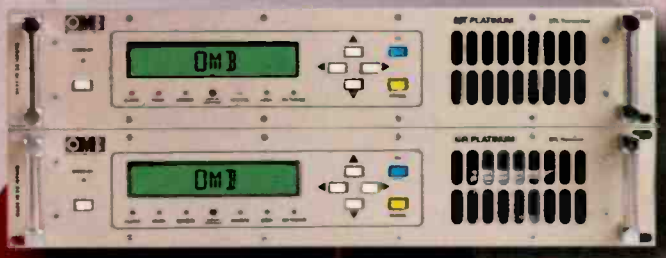
FM10-HD: The successor to the FM5, the FM10-HD offers a five-band AGC followed by a 10-band limiter. The FM signal chain includes pre-emphasis and peak control as well as a reference-grade stereo generator. The HD signal chain includes its own specialized peak controller tailored for the codec utilized in FM HD Radio broadcasting. Features include: High-pass filter may operate in stereo or M/S modes; automatic audio source failover on analog and digital audio inputs; separate audio input gains for analog and digital inputs; four-band parametric equalizer; five-band linear phase crossover with adjustable crossover points; exclusive five-band Vorsis Multiband Dynamics Controller; precision 10-band final limiter with distortion masked clipper, FM output simultaneously available as AES3 and analog; reference-grade multiplex encoder with selectable composite clipper; multiplex filter; and twin composite outputs.

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

OMB
BROADCAST

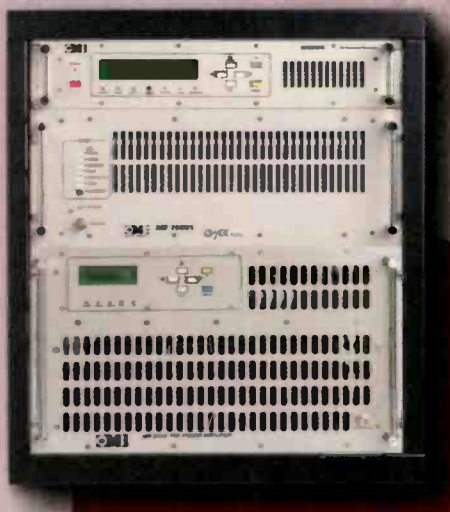
FM TRANSMITTERS

All transmitter powers with the best quality price ratio



MT/MR PLATINUM >1GHz

is a high-performance Studio-to-Transmitter Link. It is made up of the 5W MT transmitter externally synthesized in 10MHz sub-bands with a step of 100KHz, and the MR double conversion receiver, that is externally synthesized, too. The MT is microprocessor controlled, and includes LCD display for the visualization of the most relevant transmission parameters (frequency (6-digit), forward and reflected power, modulation level), balanced Mono, Stereo (MPX). The MR receiver has the same visualization system as the transmitter. It includes balanced Mono and Stereo (MPX) outputs. Furthermore, the MT/MR Platinum STL includes a jumper in order to get a proper operation with digital signals.



EM 2000

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

EM 10000

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

www.omb.com

Visit Us at NAB Booth #C3024

OMB AMERICA

factory and laboratories
phone. (305) 477-0973
(305) 477-0974
fax. (305) 477-0611
3100 NW 72nd. Ave. Unit 112
MIAMI, Florida 33122 USA

OMB EUROPA

departamento comercial
teléfono. 902-187878
fax. 902-187878
Avda. San Antonio, 41
CUARTE DE HUERVA
50410 Zaragoza, ESPAÑA

From september in:

fábrica y laboratorio
teléfono. 902-187878
fax. 902-187878
Pol. Ind. Centrovía C/Paraguay, 6
LA MUELA
50196 Zaragoza, ESPAÑA

The 2008 NAB Show
Photo Blog

1. Stephen Turner talks business for Audio Science.
2. Pam Medley explains some of Lectrosonic's wireless options.
3. The Aphex Model 230 was set up with several mics to show the processor's capabilities.
4. Bright ideas in LED tower lighting are all about at TWR Lighting.
5. Tim Koza explains Henry Engineering's compact USB console.
6. Evan Scott Smith presents Beyerdynamic headphones and wireless systems.
7. Tom Pittenger describes the Inovonics Model 525-AM.
8. Richard Daar and Tom Zarecki of Jetcast discuss radio streaming options with clients.

NEW

full featured, professional consoles at amazing prices from ARRAKIS

ARC-15

only...

$3,495

ARC-10

ARC-10U unbalanced $1,599

ARC-10BP balanced $2,495

If you thought that you couldn't afford a new console,

then you can think again !

- Two stereo Program output buses with mono mixdowns
- 10 or 15 Input channels (optional 16 x 3 stereo remote selector)
  - 1-5 high performance mic channels (optional 48V pwr)
  - One Phone hybrid input channel for Live or Off-line
- Cue speaker with amp & Headphone amp for 8 ohms (or Hi-Z)
- Logic for source control or Talk studio / announce booth

www.arrakis-systems.com

970-461-0730

The 2008 NAB Show
Photo Blog

1. Lots of exhibitors were ready to go on Sunday afternoon, including Translantech Sound.
2. Ibiquity had a huge assortment of HD Radio receivers on display.
3. Ernie Belanger puts finishing touches on the Armstrong Transmitter logo.
4. Gustavo Robles shows the codecs at AEQ.
5. Jim Armstrong shows off features of the Axia Element.
6. It's all about monitoring at the Audemat booth.
7. JK Audio displayed its line of compact audio interfaces.

See more photos of the 2008 NAB Show on the Web at radiomagonline.com/nab_photoblog

COMPLETE MICROPHONE TO ANTENNA TECHNICAL SERVICES

BALSYS
TECHNOLOGY GROUP, INC.
RADIO BROADCAST TECHNICAL SERVICES

Complete Systems Integration
Studio and RF Systems Installation, Test, & Documentation

HD Radio Transmission
Factory Authorized By Several Manufacturers For HD Installation & Certification

Plug & Play Transmitter Buildings
Solid Reinforced Concrete Shelters With All Equipment Installed, Tested, & Documented - Ready For Simplified Site Build

BALSYS
WOOD ARTS, INC.

Custom Broadcast Studio Furniture
High Quality, Distinctive, & Rugged Studio Furnishings - Designed & Fabricated For The Specific Studio & Application

SYSTEMS STORE.com

SystemsStore
Your Online Source for Cable, Connectors, Punchblocks, Racks, Wire Management, Test Equipment, Tools, & Problem Solvers To Complete Any Technical Installation.

BALSYS COMPANIES • 890 Carter Road #150 - 160, Winter Garden, FL 34787 USA
T: 407.656.3719 • F: 407-656-5474 • www.Balsys.com • www.SystemsStore.com

Building the New Guild

The Ralph Guild Radio Studio inside the Paley Center is brought up to date

By Allen J. Singer

Anyone who loves pre-recorded entertainment will appreciate a visit to the world of broadcasting from yesterday and today at the Paley Center for Media.

More than 140,000 programs are available at the Paley Center. Visitors daily tune into radio broadcasts from the 1920s, watch news from the 1950s, and view classic television that spans from The Honeymooners to The Simpsons. Educational programs that explore and celebrate the creativity and innovations of those who shaped media can be experienced in the Paley Center's theaters and screening rooms.

In 1975 broadcast pioneer and CBS mogul William S. Paley founded the Museum of Broadcasting at 1 East 53rd St. in Manhattan. His intention was to collect and preserve historic broadcast programming that reflected American culture and make it accessible to the public. Programs were chosen that demonstrated artistic achievement, social impact or historical significance. The name changed to the Museum of Television and Radio in 1990 and the institute moved to 25 West 52nd St. In 2007 it became the Paley Center for Media to reflect the ongoing changes in the media landscape. The collection has since continued to expand and the center has grown into a cultural destination.

Outside the Paley Center for Media
Photo by Norman McGrath

Omnia 6EXI is:

AND EVERYTHING IN BETWEEN

Omnia
A Telos Company

Building the New Guild

Productions

The Paley Center is located inside a 16-story building in midtown Manhattan and is a one-stop shopping experience for everything broadcast-related. Educational shows and classic TV are presented in the Mark Goodson Theater on the second floor, the Annenberg Foundation Screening and Education Room, and two smaller screening rooms. To keep things fresh, the productions change daily. There may be compilations like *Funny Women of Television* or episodes of *The Muppet Show*, *The Simpsons* and the *Carol Burnett Show*. Historic footage, such as the Frost/Nixon interviews also regularly appear on the screens.

Live bands perform in the Concourse Theater on the lower level in front of an audience of 200. Some events are recorded, and Web surfers can view them on Yahoo TV and the Paley Center homepage. The Goodson Theater seats 90 and is ideal for small shows. WFAN's Mike and the Mad Dog afternoon sports show broadcast live from the Goodson Theater in December, 2007. The extra space was needed for television cameras.

On the fifth floor is the Ralph Guild Radio Listening Room. In here, visitors wearing private headsets can hear audio clips and radio programs. Selector boxes are used to choose from five programmed channels featuring different series that highlight the diverse themes of the collection. *A Toast to Dean Martin*, *Salute to Sonheim* and *Black Radio: Telling It Like It Was* are three of the many programs that can currently be heard.

Ian Larkin engineering a session at the Ralph Guild Studio.

In 1992 a unique radio studio was built inside the Ralph Guild Listening Room. It was funded by award-winning radio veteran and then Chairman of the Board Ralph C. Guild. Visiting broadcasters now had the ability to conduct remote broadcasts and out-of-town interviews from the Center via ISDN. Since then, the studio has played host to music groups, U.S. presidents and hundreds of radio personalities. Some are regular clients, but many are one-time-only events.

The Ralph Guild Studio at the Paley Center for Media provides the necessary facilities for in-house production and program origination for visiting radio stations.

New equipment

The studio was a resounding success. But a decade later, the early-1990s equipment was worn out. Technology had changed. With new equipment, the studio could better serve the radio stations that relied on it for broadcasting. And maybe sound a whole lot better, too.

All the old stuff had to go: the mixing console, Tascam DA-30 DAT machine, and Telos One and Zephyr. Making things worse, the mic picked up the room's air conditioning noise. Sound insulation for the ceiling was needed. Some of the building's exhaust fans were old or inadequate and had to be replaced.

In 2007 plans were enacted to redesign the equipment layout and improve sound quality without knocking down any walls. Doug Warner, Paley Center director of engineering, took the helm as project manager. Daking Plus donated the audio equipment and chipped in to help.

The process took only three months and installation was

Building the New Guild

The standard L furniture configuration with a rear countertop provides easy access to all the equipment.

a breeze. That August, the ribbon was cut on the rebuilt Ralph Guild Radio Studio. The doors were open to radio hosts from across the region and around the world.

Staff and visitors find the new furniture comfortable and the equipment easy to use. The real magic, though, is created behind the scenes. The goal was to bring the studio up to date given the needs of the Paley Center. A new Sierra Automated Systems Rubicon SL-16 audio console takes the place of the old board. RJ-21 and CAT 5 cables are terminated on SAS/Krone blocks, which made installation easy. Because SAS does not offer a mic preamp for that console, a Daking Mic-Pre IV preamp has been integrated into the system. It takes just one rack-space and delivers four channels of high-performance, Class A preamplification. Geoff Daking and David Thibodeau of Daking Plus arranged for the Rubicon's RS-485 protocol, MIDI and USB to digitally control the Mic-Pre IV. The front panel of the Rubicon console easily loads any of the Mic-Pre IV settings with a simple click of a button.

Four Heil Sound PR 40 dynamic broadcast microphones surround the interview table. Each mic uses a Heil Sound microphone stand, because its footprint is smaller. The producer uses a Heil Sound mic, and another is at the console for self-engineered broadcasts. The PR 40 was chosen for its flat frequency response and articulation with a midrange rise at 5kHz.

The previous world panels were incapable of handling the different audio formats available today. Using Studio Hub products, four new interface panels were built. Analog sends and receives are available in XLR, RCA, 1/4", and 1/8" as well as S/PDIF and AES. All analog signals are balanced and level-matched. The S/PDIF signals are converted to and from AES3. Now the studio can easily accommodate the many different types of professionals that visit the Paley Center.

The output signal is sent into a Telos Zephyr Xstream codec for ISDN transmission to networks like Air America, National Public Radio, and on radio stations from as far away as California and Washington State.

Audio editing

Audio is edited in the Ralph Guild Studio using Digidesign Pro Tools. A Heil PR 40 mic and stand, Telos phone hybrids, CD players and 360 Systems Digicart machines have also been installed.

New York City is one of the country's two locations for the Paley Center for Media. The other is on the West Coast. In Beverly Hills, at 465 Beverly Drive, near Rodeo Drive is the Los Angeles branch of the Paley Center. It opened in 1996 in the new Leonard H. Goldenson building, and features a duplicate of the collection found in New York. The building is two stories high and has a screening room and art gallery, the Bud Yorkin Balcony encircling the second floor, Stanley E. Hubbard Library and adjacent Console Center, John H. Mitchell Theater, Ahmanson Radio Listening Room, and just like its New York cousin, the Ralph Guild Radio Studio. There are plans to upgrade this studio and outfit it with video equipment and move it streetside with a window facing the sidewalk.

At a time when radio has gone corporate and television has turned to reality, the Paley Center for Media will be there to remind us that radio and television will always be an American art form, and thus deserves preservation.

Singer is a freelance writer and former radio engineer based in Cincinnati.

Equipment List

Sierra Automated Systems Rubicon SL-16
360 Systems Digicart
Daking Mic-Pre IV
Denon DN-C680
Digidesign Pro Tools
Genelec 8030A
Heil Sound PR 40
Krone blocks
Radio Sytem Studio Hub+
Rane PEQ 55
Tascam DA-30, 122 MKII
TC Electronic M-One XL
Telos 2x12, One, Zephyr Xstream

TECHtips

www.RadioMagOnline.com

Tips, tricks, hints and more

By John Landry, CSRE

Big hands, big button

Live studio operations still rely on people pushing buttons, and more often than not the buttons and switches on today's equipment do not hold up well to repeated pushing (or sometimes pounding).

Industrial machine buttons can be used for stop, start, next event, delay dump and other functions buttons in a studio. McMaster-Carr number 7557K85 is a SPST contact switch rated at 10 amps, which mates to several available buttons including a 2.76" diameter mushroom (McMaster-Carr number 7544K61). Both parts of the switch can be replaced. This system is used by a well-known cable TV financial talk-show host to fire sound and video effects. These switches are the only ones that will handle his pounding without failure.

Want something even bigger? We also found the FAK switch from Klockner-Moeller. Listed as a palm or foot switch, the red or black cap, which can also be illuminated, measures 3.7" across.

The Klockner-Moeller FAK.

Thanks for the idea

Justin Kaiser wrote to us regarding the mic flag idea we ran in Tech Tips in the May issue. He had four old mic flags that, as he says, were, really skuzzy. He wanted nice flags for his studio but didn't want to spend the money to have them made.

Kaiser said, "Your simple quick fix was amazing. I took a razor to the old logos, cleaned them with Naptha, painted them with a high-end plastic paint that supposedly sticks to everything (these flags were very yellow from smoke and age. I couldn't find the 4" clear labels, so I picked up the 1" x $2^5/_8$" labels and used two per flag."

His total cost was about $20. Kaiser says he has found lots of uses for Naptha now, too.

The results of Justin Kaiser's efforts.

Free tools you can use

Shortly after the PC came onto the scene, there began a steady stream of free software for the broadcast engineer. Much of it is still available, and updated to run with contemporary operating systems. Some are available at RadioMagOnline.com in the Engineer's Notebook. Many more can be found through online searches.

Here are some of the more useful programs I have found.

E-Slide – From Continental Electronics, this utility includes FM contour calculator, satellite acquisition, STL design, H-pad calculators and others.

Starguide Relay Logger – a relay logging program that can save hours of troubleshooting time with automated programs.

toolbox.exe – A compilation of 20 different calculating routines for everything from FM power to shunt capacitance of tee networks.

Endec Remote – A Windows utility for controlling a Sage Endec unit remotely.

Some to look for with online searches:

wnettime.zip – Don't have a timeserver on your network? Run this.

abrterm.zip – A utility for remotely controlling a Comstream ABR-200/220 series satellite receiver.

easwatch.zip – A program for logging EAS activity, which can save lots of time and effort reconciling logs at the end of the month.

For the adventurous types, a GNU/Linux broadcast automation system (for playout, logging and editing) is available free from the Rivendell project at www.rivendellaudio.org.

Landry is an audio maintenance engineer at CBS Radio/ Westwood One, New York.

Do you have a tech tip? Send it to us at radio@RadioMagOnline.com

Top tips wanted

Earlier this year, we asked for submissions for Tech Tips. The best tip selected would receive a copy of the *Pocket Ref* by Thomas J. Glover. We chose the mic boom flying spring fix submitted by Kirk Chestnut at Entercom Kansas City. That tip appeared in the March 2008 issue.

Keep sending those tips to us. If we use yours, you could earn SBE recertification for it.

Austincredible!

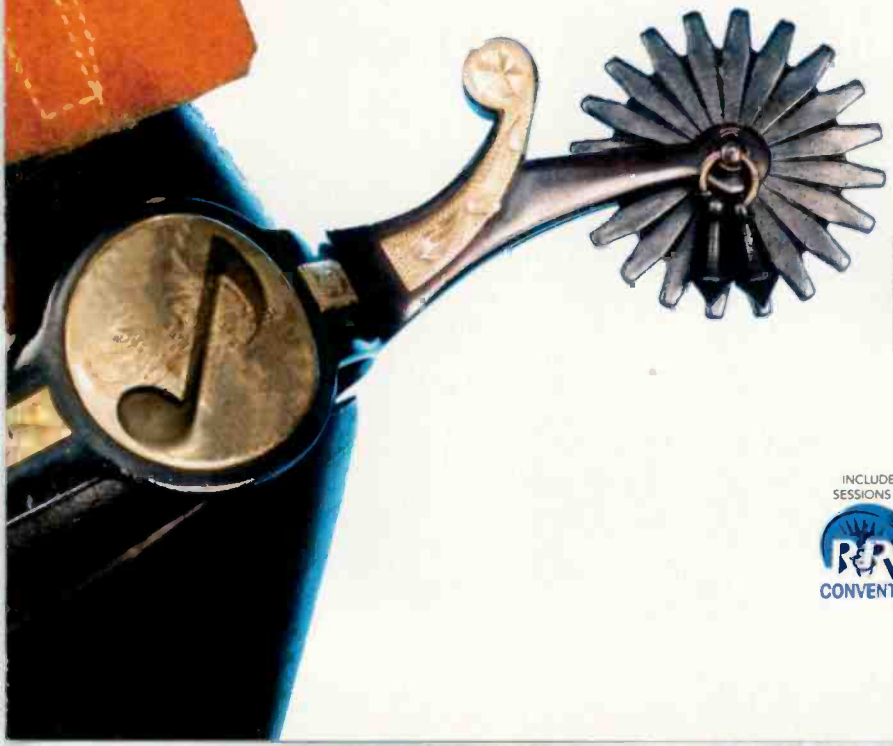
Radio's Best Information and Innovations = One Incredible Investment

Learn something new this September at The NAB Radio Show® and benefit from:

- Results-oriented insight and ideas to implement the moment you get home
- Strategies to secure your station's success, regardless of market size

This year's event features sessions devoted to new technologies, such as streaming, video and on-demand audio to enhance your station's reach, brand and revenue. Additionally, The NAB Radio Show delivers expert-led sessions addressing the hottest industry topics, such as: thriving in a multi-platform world; using new technologies to generate new revenue streams; managing in a challenging environment; developing talent; and cultivating the next generation of listeners.

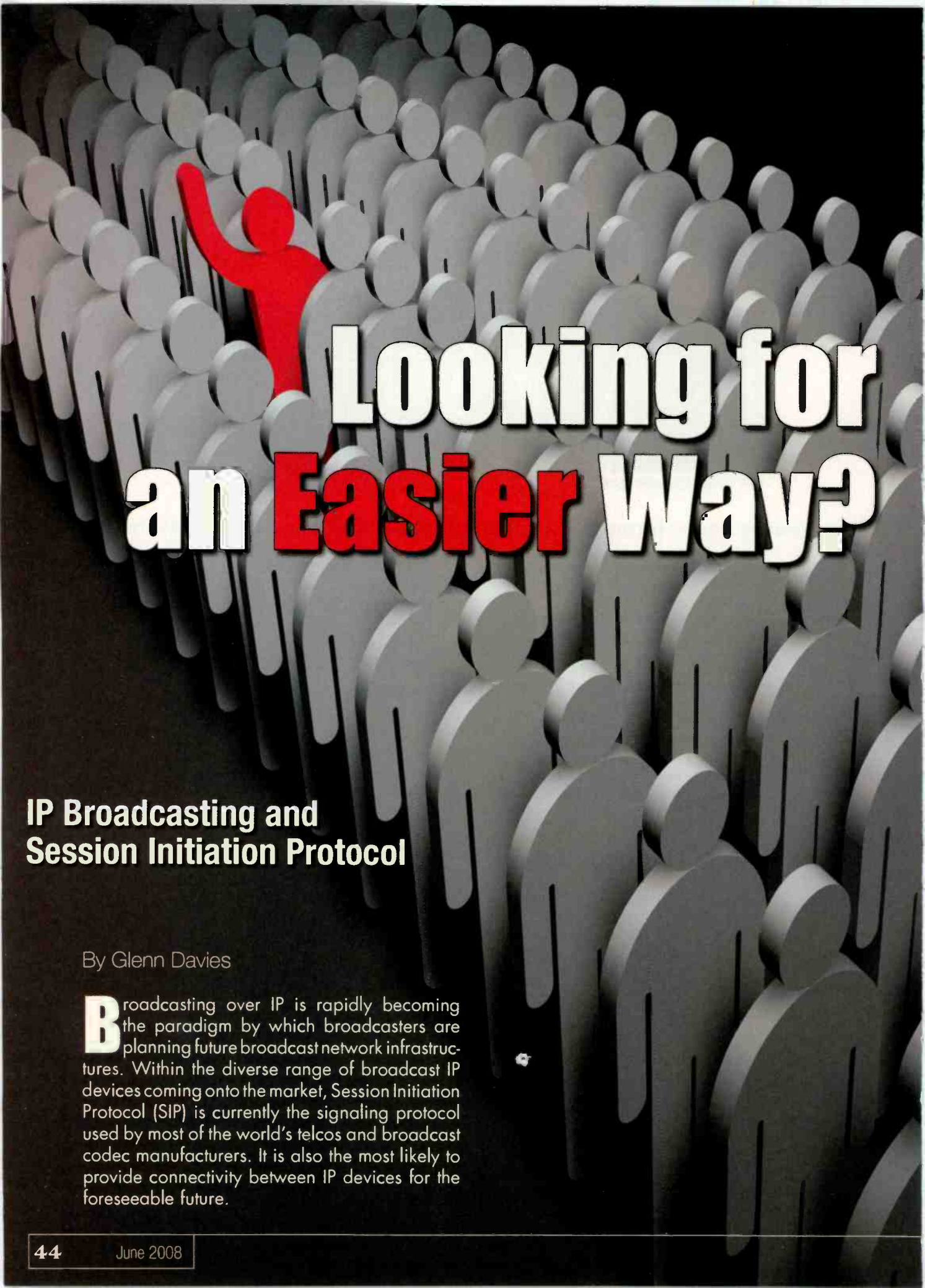
When it comes to return on investment, The NAB Radio Show delivers high-value information, networking opportunities and an exhibit hall packed with new innovations for HD implementation. Register today and you'll soon say, "Austincredible!"



THE NAB RADIO SHOW®

INCLUDES SESSIONS AT:
R&R CONVENTION

September 17–19, 2008
Austin Convention Center
Austin, Texas
www.nabradioshow.com



Looking for an Easier Way?

IP Broadcasting and Session Initiation Protocol

By Glenn Davies

Broadcasting over IP is rapidly becoming the paradigm by which broadcasters are planning future broadcast network infrastructures. Within the diverse range of broadcast IP devices coming onto the market, Session Initiation Protocol (SIP) is currently the signaling protocol used by most of the world's telcos and broadcast codec manufacturers. It is also the most likely to provide connectivity between IP devices for the foreseeable future.

If Space Is Truly The Final Frontier, We're Your Enterprise...

Designed for Quality, Function, and Beauty

pictured: Modulux Premium

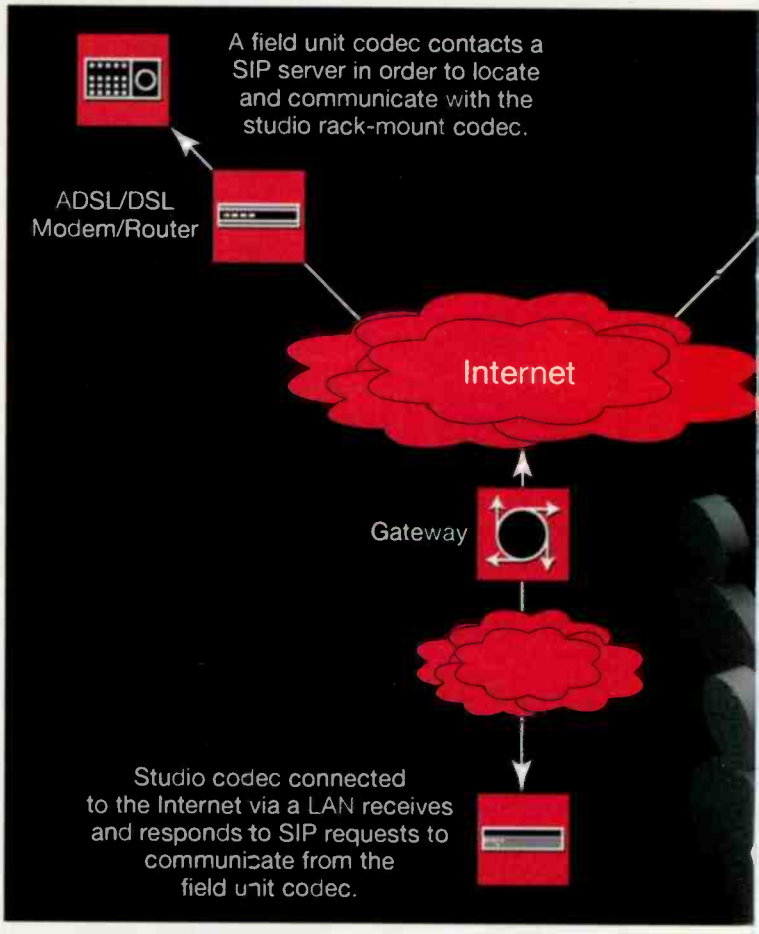
- In Stock for Quick Delivery
- Precision Manufactured by Award Winning Craftsmen ("Cool Stuff")
- "White Glove" Delivery Available
- Turnkey System Integration
- Known for Quality and Service since 1984

GRAHAMSTUDIOS

Broadcast Furniture...System Integration...Automation

www.graham-studios.com • Toll Free 866.481.6696

Looking for an Easier Way?



The functional signal flow of two SIP-enabled codecs connecting via the Internet.

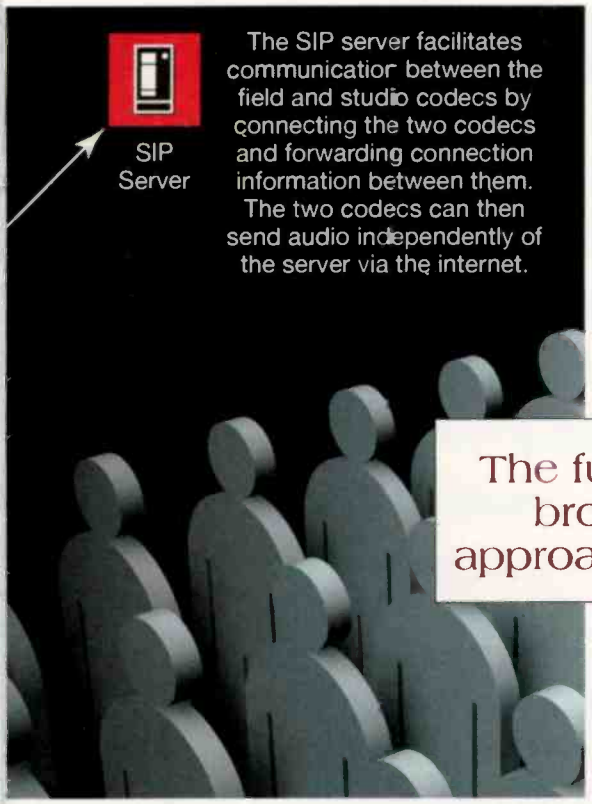
To understand the context in which SIP is developing as a signaling protocol, it is useful to know some background about SIP, its history and how it is currently used in broadcast products.

What is SIP?

Session Initiation Protocol (SIP) is an open standard application layer signaling protocol used to facilitate connections over IP networks and the Internet. SIP can work with a myriad of other protocols to establish connections between all sorts of different devices, and it is capable of supporting audio, video and instant messaging technologies, without regard for the particular device or the media content delivered. Historically, it has been widely used in VoIP applications. It has also been used for multimedia distribution and multimedia conferencing and can be used to create two-party, multiparty or multicast sessions. More recently, its ability to create and manage connections over the Internet has led to its integration into an increasing number of broadcast audio and video products that stream data packets in broadcast applications.

There are two distinct parts to a call when dialing and broadcasting over IP. SIP is used in the initial stage for call setup. The second stage is when data transference occurs, and this is left to the other protocols used by a device (i.e. using UDP to send audio data). SIP only defines the way in which a communication session between devices should be managed. It does not define the type of communication session established.

Broadcast audio codecs can use SIP to make peer-to-peer connections between two codecs. In this scenario, IP addresses are



used to dial between two codecs and then SIP uses Session Description Protocol (SDP) to negotiate the features used during a call. This may include the bit-rate of the connection and the algorithm.

One of the challenges in broadcasting audio over the Internet is creating reliable connections that support remote broadcasting from different locations. In the past, broadcasters have used IP addresses as a method of connection but this has been complicated for two reasons. Dynamically assigned IP addresses often change and are therefore not reliable for dialing. In addition, private IP addresses, such as those assigned over private LANs, cannot be dialed directly by a device outside a private LAN. This principle is very similar to dialing a phone's extension number

The future of SIP technology development for broadcasting is being driven by different approaches required for broadcast applications.

within a PABX system. Extension numbers within these systems cannot be dialed directly from outside the PABX.

To solve this requires either the programming of a static public IP address into a device like a codec, or the use of Network Address Translation (NAT) and port forwarding to avoid firewall connection issues.

Establishing a SIP connection

By Chriss Scherer, editor

For two codecs to successfully communicate via SIP through a SIP server, information must be exchanged between the two devices. Codecs manufactured by members of the Audio-via-IP Experts Group are SIP compliant. These manufacturers include AETA, Mayah, Oban/CRL and Tieline.

When one codec attempts to communicate with another via SIP, the two units begin the negotiation process shown in the figure.

Codec 1 first suggests an audio encoding algorithm, sampling rate and coding rate, such as MPEG Layer 2 at 48kHz and 384kb/s. Codec 1 can also suggest an alternate encoding method, such as MPEG layer 3 at 44.1kHz and 256kb/s. Codec 2 is unable to use Layer 2 audio, so it selects the alternative (Layer 3) by responding with those settings. Codec 1 acknowledges the chosen algorithm by transmitting an ACK signal. The two devices are then connected via the Layer 3 option.

It is common for a device to offer several options of encoding to ensure that a connection can be established. The SDP portion of the SIP message carries this information, and the choices are offered in an order of priority for the receiving codec to choose.

SIP can be used to work around this problem by using a SIP server (registrar) to act as a gateway between public and private IP networks. The first step is to connect each SIP-compliant device to a SIP registrar which assigns SIP addresses (similar to an e-mail address) to a device. Once two devices are SIP-registered they can find each other by connecting to SIP servers and exchanging connection information. This process is displayed in Figure 1 (page 46).

When a SIP call is initiated, a SIP server establishes a device's location, determines its availability and negotiates the features to be used during a call. Audio is then streamed according to those parameters.

Using SIP in broadcast audio applications

In essence, the future of SIP technology development for broadcasting is being driven by the different approaches required for broadcast applications. Tieline Technology saw the potential of SIP several years ago and has been working on broadcast IP methods using SIP since 2005.

The partners in the Audio-via-IP Experts Group, which includes Tieline, Aeta, Mayah and Orban, see SIP as the future of IP connectivity in broadcasting. The group has been working recently with the EBU to test and develop EBU-approved standards for broadcasting over IP using SIP.

Central to this is the development of common standards of connectivity between manufacturers. From an interoperability perspective, audio codecs using SIP that are EBU compliant should all be able to connect to each other more easily than in the past. Recent interoperability testing by Tieline and eight other European codec manufacturers found they were all able to connect over IP using SIP. These tests used peer-to-peer connections that don't use SIP servers.

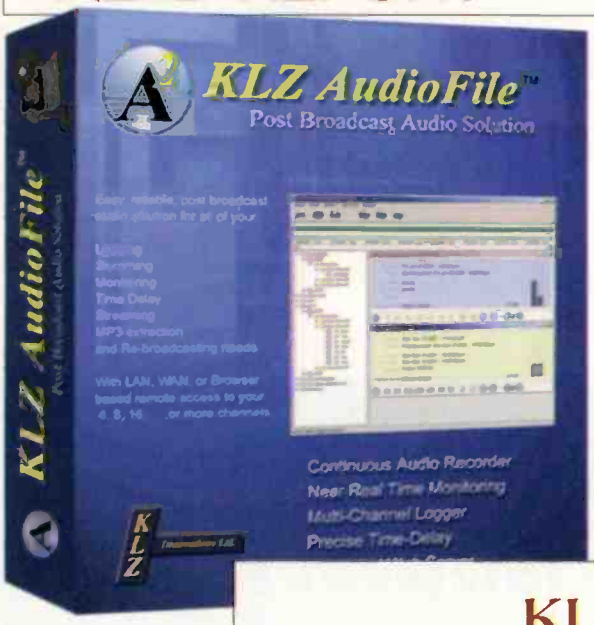
On the other hand, SIP-compatible audio codecs registered to SIP servers can simply dial and connect to other codecs and VoIP devices without knowing their IP address. This hugely simplifies remote broadcasting over IP and is particularly useful when broadcast locations are constantly changing.

One current issue is that most current SIP servers are configured for VoIP traffic and provide low quality audio using G.711 or GSM algorithms. For broadcast codecs to take advantage of SIP server connectivity, the SIP server should support higher quality algorithms such as MPEG, AAC and other proprietary ones. This requires a broadcaster to use a more compatible SIP server or transversal server to negotiate higher quality connections.

Broadcasters will also face some other challenges with SIP, including how to deal with Telcos who block SIP traffic. This is done to stop SIP traffic competing with other phone network products and is accomplished by blocking port 5060, which SIP uses to communicate between devices.

Negotiating these challenges will not happen overnight, but, given the flexibility and promise that SIP has displayed, broadcasters will continue to work with the various stakeholders to develop SIP functionality in years to come.

Davies is a technical correspondent for Tieline Technology, Indianapolis.



KLZ Innovations Audiofile

By Terry Kelly

Just over two years ago I was looking for a new, versatile and easy-to-use audio logger for our radio stations. I wanted to extract audio files in MP3 format that could be edited by our producers and announcers, and I needed a skimmer that allowed audio downloads from the logger, selectable to the second. I also needed to note alarm conditions, periods of silence and any logger failures. In our case, Canadian broadcast rules require all stations to keep 90 days of program logs.

At a broadcast engineering conference I approached KLZ Innovations with the concept of the logger I was looking for. Three months later the company released an audio logger called Audiofile. It was bullet proof. Even in the beta issue I was originally sent I could not break it or make it fail. I have been using the final release version for more than two years now and have never had any issues.

Installation

I installed the software at my radio stations in eastern Ontario, Canada. The system is available in 4-, 6- and 8-channel configurations. It provides skimming, which the PDs and announcers use extensively to download audio cuts from their shows. It has a built-in streaming server to monitor the audio over the network and Internet. There is a very good Audiofile player used to listen to and download audio cuts. The silence detection and alarms are built into the software to monitor off-air conditions.

One of the best features of the logger is that the software runs on a computer in my rack room, and the sever runs as a service, which make it difficult to be accidentally disabled or shut down.

I can also record audio on separate channels at different sample rates and store the audio for different lengths of time. For example, my air feeds are sampled at 128kb/s low sample rate and the audio is logged for 90 days. This fulfills my CRTC requirement. My main program feed is logged at a high sample rate of 320kb/s, but I only keep this for 30 days. This higher-quality archive is used by the production department to extract elements for promos and other station needs. When an audio element is downloaded to the desktop for use by producers and announcers for editing, it does not affect the original recorded material. The original is kept safe.

Software

When we installed the software, followed the step-by-step documentation that outlines the process, including all the setup information. I installed the client software on the users' computers and then demonstrated how to locate, play and download audio cuts. Most users understood the operation and were using the system right away.

The client software looks like a traditional computer audio player. The player can be set up with or without a password. There is a green bar across the top of the player that represents the recorded audio. The bar represents a scalable timeline of recorded audio. Users can click on the bar to find specific times within the audio file.

We pay KLZ an annual fee for support. The telephone support is superb, and KLZ can trouble-

Performance at a glance

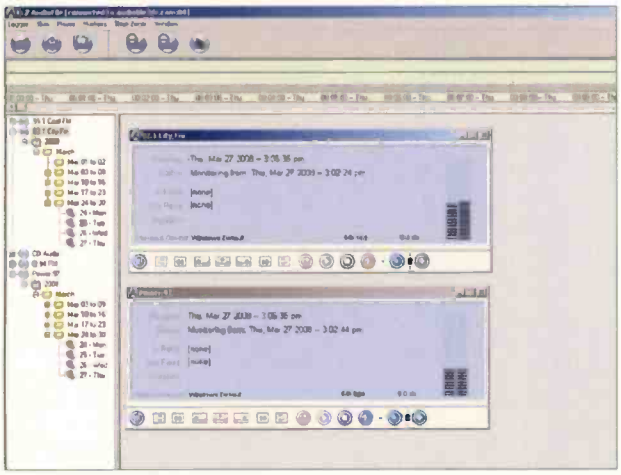
Audio and GPI delay system

Mic skimmer

Audio logger

Silence detector

MP3 streamer and extractor



The control interface shows a file directory tree and the recorder control panels for the various feeds.

shoot my server remotely. Documentation for users is contained in a manual, that explains in depth how to use the player to download/listen to audio from the logger. The developers are always there to support any issues and answer any questions I have ever had.

KLZ Innovations

P 800-334-9640
W www.klz.com
E sales@klz.com

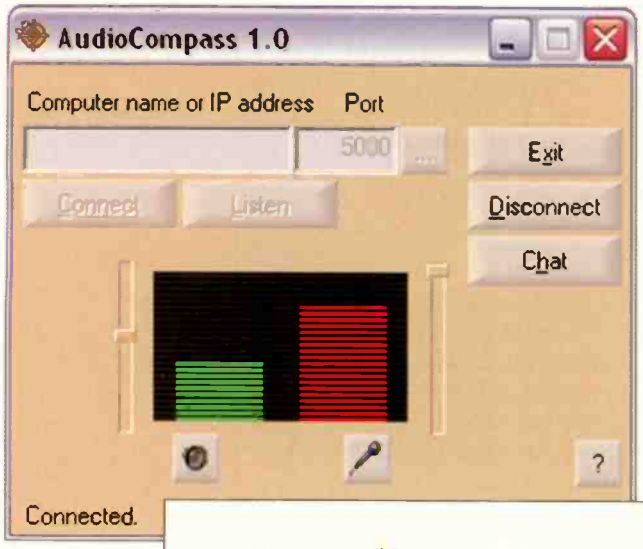
Overall, I'm pleased with the reliability and ease-of-use of the KLZ Audiofile. It's not only fulfilled our legal obligation, but provided a useful tool that has benefited engineering, programming and production.

Kelly is chief engineer of CHUM Radio Kingston Brockville and Peterborough.

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

These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of *Radio* magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by *Radio* magazine.



Audio Compass 1.0

By Todd Feinburg

ISDN is a cumbersome technology for broadcasters. While it works fine for permanent remote broadcast sites, it can be difficult and slow to use as a casual remote platform. Adding to ISDN's problems is the harsh reality that phone companies are eager to do away with the technology. The Internet represents the obvious alternative to copper wire, but it has always presented issues regarding delay. No longer.

A new software application called Audio Compass makes remote radio broadcasts easy. Now we can produce shows wherever there's high-speed connectivity and a PC. Audio Compass is a simple software application that turns your PC into an audio codec. A fully functional trial version lasts for 30 days.

Goodbye ISDN

I moved to a new home recently and discovered that Verizon wouldn't install ISDN for me. Too far from the central office, they advised. Verizon is getting out of the ISDN business during the first half of 2008 – no new installs, and no support for existing ones. I needed a solution.

I spoke to my friend Howard Monroe, owner of WVLY in Wheeling, WV, who I recalled had mentioned that he used Skype, a VoIP service, for remotes. It worked fine, but I had my doubts about it for my purposes. I have a syndicated talk show with several FM talk stations carrying my weekend program, and I couldn't imagine how Skype could provide adequate quality for a three-hour program.

Howard, feeling challenged, located Audio Compass, a just-launched application that allows the transfer of low-delay, crystal-clear audio over the Internet from one location to another, or even several destinations at a time. It encodes audio on the fly using UDP to transfer datagrams via the public Internet, then decodes it at the receiving end for instant playback. It's broadcast quality and peer-to-peer (no server in the middle). You make contact by typing in the destination IP address and the two sides are instantly connected.

Performance at a glance

- Low-delay audio connection
- 8kHz to 44kHz sampling rates
- Bidirectional connectins
- Auto reconnect
- Optional buffer for challenging connections
- Multiple encoding algorithms

An instant success

Audio Compass allows me to do my talk show from home once again. But this is the first edition, and it isn't without its quirks.

Because it operates in the Windows environment, there are Windows issues to deal with. Most important has been the need to leave all the computer's processing power available for the broadcast.

If poor connectivity is a problem, it is possible to adjust how much bandwidth the software uses. I've been quite comfortable using it at 32kHz rather than the maximum 44kHz, and the sound quality is great. But software developer Sam Bushman says the quality remains fine going down to 22kHz or lower.

Delay can be adjusted to protect against dropped bits of data. This is a great option if the software is used to send audio in one direction, but is a compromise if used for two-way talk. For example, Howard now uses Audio Compass to send his air signal to the transmitter, so there's no reason not to add some extra delay to give the packets more time to get to the transmitter side.

The program creates a very stable connection, disconnecting only once during a broadcast in the

two months I've been using it. But thanks to an automatic reconnect command, the impact was not of great consequence.

Reconfiguration

Configuration options are written into the properties of the program shortcut, effectively hiding the software's flexibility from the innocent user. The concept is that an engineer can set it up, and a host can't mess it up. This has some advantages, but also some disadvantages. What happens when you're on remote, there's no engineer around, and you need to reconfigure to adjust to a slow Internet connection, for example?

Also, the program configuration must be identical at both ends or things might not work. This makes it harder to make quick changes, requiring that someone savvy is on both ends of the broadcast. It would be better, I think, to make one end the boss, so if changes need to be made on the fly, they automatically affect both sides.

Audio Compass is the first of a new generation of broadcast codecs that will be entirely PC-based and operate over the Internet rather than telephone lines, digital or analog. A new version of the software will be out soon, and some options will be added to deal with some of the challenges.

Audio Compass provides a solid option to ISDN, with flexibility that ISDN could never offer. It's a no-brainer when you want to be able to remotely broadcast, and is a fine alternative for doing live radio shows from permanent remote locations.

While you may be satisfied with the remote technologies you're using, the cost of entry is so small that I'd recommend getting Audio Compass now so you can explore its powers. With ISDN on the road to extinction, Audio Compass has arrived just in time.

Audio Compass

P 801-756-9133
W www.audiocompass.com
E sales@audiocompass.com

Felnburg hosts a nationally syndicated weekend talk show and consults on Internet-based radio technologies.

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

These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of *Radio* magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by *Radio* magazine.

by Erin Shipps, associate editor

Handheld spectrum analyzer
Agilent Technologies

N9340B: The New N9340B Handheld Spectrum Analyzer with bright display and powerful new features boosts field test productivity, saves time and reduces the cost of maintenance. The N9340B covers a frequency range from 100kHz to 3GHz and is designed for field tests such as interference analysis, spectrum monitoring and on-site repair. Operation in diverse conditions is possible with the new 6.5" TFT color screen and back-lit keys, indoors or out. Other new features include: spectrogram, spectrum emission mask, USB Power Sensors support, and AM/FM and ASK/FSK modulation analysis. It also offers remote control over USB and LAN for remote operations.

800-829-4444; www.agilent.com

Two-channel recorder
Nagra

Nagra LB: Compact and versatile, the Nagra LB is a two-track recorder. It is a 16/24-bit device with an Ethernet connection and Bluetooth communication. Sampling frequencies of up to 192kHz are available depending on the application desired. This portable recorder can record and edit the material in the field and return it to the studio over the GSM network by means of the Bluetooth communication with a mobile phone. It can be connected directly to the Internet through its Ethernet port. Files can be immediately transferred over IP, representing an easy way of putting music and other recordings onto the Web. The microphone inputs are fitted with a special integrated vortex filter to virtually eliminate wind noise. They are equipped with linkable audio limiters, +48V phantom powering and independent sensitivity selection switches. An AES digital input can also be fed to a dedicated XLR connector.

615-726-5191; www.nagraaudio.com
mail@nagra.com

Streaming Services
Stream On

Streaming services: This streaming service uses an Ogg Vorbis encoder to produce higher quality audio at lower bit-rates. Combined with the Stream On audio player, listeners can enjoy Ogg-quality audio within their Web browsers. Plug audio into the streaming appliance and Stream On configures and maintains the stream. There are no encoder licensing costs, viruses or maintenance required. The audio player program is independent, requiring no media player.

951-801-2309; www.streamon.fm; services@streamonfiber.com

Multifunction changeover
Axel Technology

Merlin: The Merlin is designed to provide sophisticated changeover of audio signals, such as stereo pairs and even FM multiplex and video composite signals. Incoming signals are constantly monitored and if a fault is detected on the signal applied to a set input, it will switch to a stand-by source. Up to seven internal relays can be associated to the audio switching for further alarm signalling, external signal routing, starting CD players, etc. The delay times before switching and before returning to the normal state are easily set by trimmers and jumpers. The Merlin features both XLR balanced and RCA audio inputs for an easier connection to either professional or consumer equipment. Each pair of RCA inputs can be also reverted to unbalanced foldback outputs. The balanced XLR output stage incorporates high-current line drivers capable to always deliver optimal signals even down long cable runs and with low load impedance.

+39 051 736555; www.axeltechnology.com

NEW NEW

Digilink automation from ARRAKIS

If you thought that you couldn't afford new Automation, then you should think again !

The BEST Automation system for Radio costs only a few dollars per month... COMPLETE !!!

NEW **Xtreme-PC**
$50/month
(PC required)

NEW **Xtreme-ARC**
$75/month
(PC & ARC-10 console required)

Xtreme-Bridge
$100/month
(PC required. Bridge included)

NEW... Xtreme-PC is software for off-the-shelf Windows PCs that is ideal for hard disk audio, live or automated, broadcast or internet Radio. The NEW... Xtreme-ARC software turns the ARC-10 console (which has a built in USB audio channel with logic) into an integrated console-PC workstation. Turn the console channel on-off to start-stop the PC play list and record directly from the console to the PC over digital USB. And for those stations using multiple sources & satellite networks, the Xtreme-Bridge uses Arrakis 'Bridge' hardware to control up to 16 sources plus logic. Best of all, each of the three models includes the product plus training, support, & upgrades for less than the monthly cost of most cell phone programs. Go to the Arrakis website for more information about these exciting products and order today !!!

www.arrakis-systems.com/zrrx-1.html 970-461-0730

Ipod mixer and recorder
Belkin

Tune Studio: Belkin's Tune Studio for Ipod is the first four-channel audio mixer that records directly to an Ipod. This mixer allows the input of up to four different instruments or audio sources, and records the audio at 44kHz quality onto an Ipod for instant playback.

310-898-1100; www.belkin.com
sales@belkin.com

Digital audio distribution
Destiny Media Technologies

My Player MPE: Accessible through any Web browser, My Play MPE is an innovative way for independent record labels and artists to deliver their releases over the Internet directly to radio station program directors, music directors and others with speed and security. My Play MPE places control in the hands of users by allowing independent record labels to instantly post songs for consideration for radio station airplay through a self-serve automated system.

www.destiny-software.com

Always-on analyzer
Fluke

Optiview Series III workgroup analyzer: This new always-on Workgroup Analyzer identifies every device, application and connection on the network. It addresses the issue of maintaining network performance even as new technologies and new services require infrastructure changes at central and remote locations. Located centrally, multiple users can access the workgroup analyzer at the same time. Alternatively, the workgroup analyzer can act as a virtual network engineer. By sending a unit to remote locations when needed and analyzing the data centrally, organizations can save the time and money that would be spent sending an expert to the problem site.

800-44-FLUKE; www.fluke.com; fluke-info@fluke.com

Mono interface
Rapcohorizon

LTI Blox: A scaled down, compact, mono audio version of the Rapcohorizon LTI-1 stereo interface, the LTI Blox accepts stereo 3.5mm audio from portable audio devices and provides a single mono balanced XLR output for input into professional mixing consoles. Featuring a 3.5mm connector on a three-foot cable, the LTI Blox has volume control and balanced XLR outputs.

573-651-6500; www.rapcohorizon.com
info@rapcohorizon.com

Combined media optic transport system
Fiberplex

Light Viper Shadow: The Shadow is designed for live sound and broadcast production, fixed media installations and remote recording applications. The 2.5GHz system will handle a variety of media, including audio, intercom, Ethernet, RS-422/232/485 control, composite video and TTL data. With optional component modules, DMX lighting control, MIDI, CANBUS and other control data can also be handled. The Shadow's modular components may be used independently or in combination to achieve a virtually unlimited variety of system designs for transporting various media data over a fiber optic network.

301-604-0100; www.fiberplex.com

Real-time noise reduction
ATC

Auto Audio Denoizer: The Auto Audio Denoizer performs real-time, on-the-fly automatic noise reduction. It will preserve the main signal characteristics of audio even while substantial noise removal is applied. It incorporates sophisticated tracking algorithms, enabling live recordings to filter out noise automatically. Based on a proprietary, patent-pending ATC Labs algorithm that employs state-of-the-art signal processing and psychoacoustic modeling techniques to perceptually weigh the audio and noise components, the ATC Labs Auto Audio Denoizer ensures that even under poor signal-to-noise ratio conditions, there is no compromise or distortion of the original audio source during noise removal. A free trial version can be downloaded.

702-307-2700; www.lasvegasproaudio.com/atcstmo.html
sales@lasvegasproaudio.com

Digital microphone packages
Zaxcom

Broadcaster IFB and ENG: Zaxcom's Broadcaster IFB package includes four TRX900AA transceivers with integrated IFB functionality, one IFB100 transmitter, one RX4900 single-rack receiver unit with four receivers and other accessories required to support the wireless transmission of broadcast-quality audio, 2.4GHz IFB signals and RF remote control. The ENG Package is comprised of one TRX900AA with internal recording and IFB support, one STA100 stereo adaptor, one stereo receiver and one IFB100 transmitter.

973-835-5000; www.zaxcom.com
info@zaxcom.com

Dual Input FM Antenna
ERI-Electronics Research

Lynx Series II: The LYNX Series FM Antenna is a field proven method of implementing simulcast FM IBOC operations. It combines the analog and IBOC signals in the antenna array, which is the most power efficient combining method. The new design features improved isolation of greater than 40dB, and improved input match for both the analog and digital signals. This improved isolation is part of ERI's continuing program to improve product performance and is particularly significant as the FCC considers the NAB's request to increase allowable power levels for the FM IBOC signal.

812-925-6000; www.ERIinc.com; sales@ERIinc.com

Digital radio console
Studer

On Air 2500: The Studer On Air 2500 is a totally self-contained system and builds upon the operational concepts of its predecessor, the On Air 2000. With the On Air 2500, the control surface, I/O breakout, DSP core and power supply are all integrated within a single compact chassis. The console's fader strips each include a graphical OLED (organic LED) screen, which contains a channel label, level and gain reduction meter and parameter readouts, adjustable via a rotary encoder and two push buttons below the display. OLED screens have a much wider viewing angle than LCDs, and have much higher definition, so operators can immediately see information much more clearly. The large TFT color touch screen uses Studer's patented Touch'n'Action system, where only the most important functions have hardware control elements in the channel strip making the consoles' operation very simple and stress-free.

818-920-3212; www.studer.ch
sales@studer.ch; kholmes@harman.com

Color label printer
Primera Technology

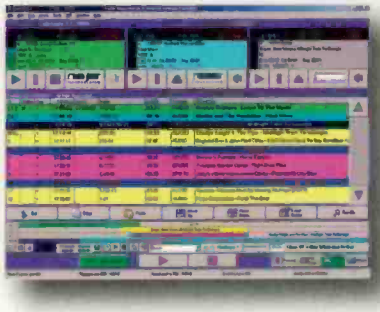
LX400: LX400 color label printers include one dye-based color ink cartridge, Nice Label SE Primera Edition design software, printer drivers, starter roll of 4" x 3" Tuff-Coat High-Gloss Inkjet Label Stock, USB 2.0 cable and instructions. Labels can include full-color photos, illustrations, graphics, text and bar codes. Depending upon the quantity printed, the price per label will be significantly less than labels printed on flexo or offset.

800-797-2772; www.primera.com
sales@primera.com

Broadcast Software

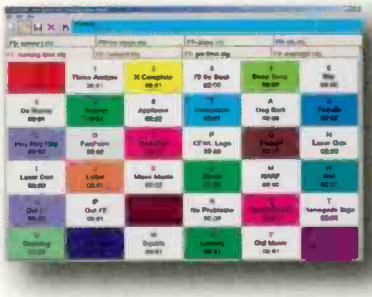
1-888-274-8721
www.bsiusa.com

Radio Automation



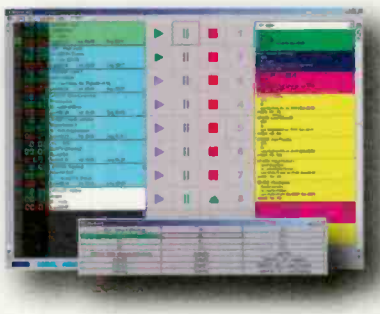
Simian - radio automation and digital play out system

Instant Audio



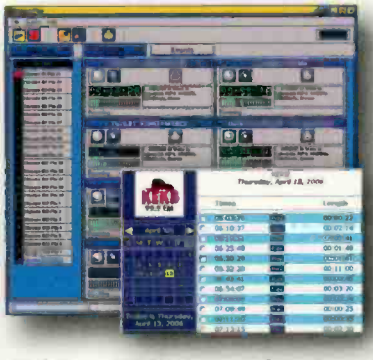
Stinger- instant acess to 288 'rapid fire' audio files

Digital Cart Player



WaveCart - the original on-screen cart machine

Audio Logging

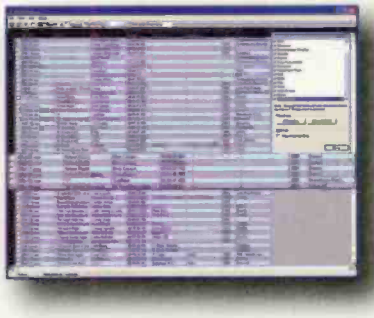


SkimmerPlus - professional audio logging and skimming

Full PC Systems

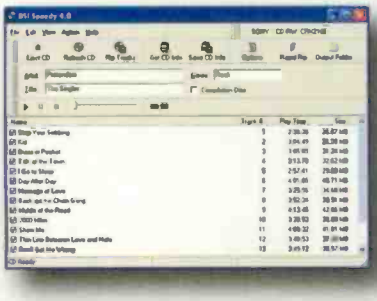
Complete PC systems - with hardware and music

Music Library



MusicStore - thousands of ready to play (tagged) songs

CD Ripping



Speedy- professional CD to PC ripping and file tagging

Sound Cards

AudioScience - built for broadcast, pro sound cards

Remote Control

Trigger & Relay Devices - for GPI/O & remote control

Broadcast Software International
503 E. 11th Avenue
Eugene, OR 97401 USA
Direct: 541-338-8588
Fax: 541-338-8656
www.bsiusa.com sales@bsiusa.com

BSI

NEW PRODUCTS

Power conditioner
Furman Sound

Merit X Series: The Merit X Series is an upgrade to Furman's existing Merit line, which provides convenient, rack-mountable power conditioning products. The M-8x provides eight filtered and protected rear-panel outlets with a front-panel convenience outlet, and a Protection OK indicator light. The M-8Lx adds pull-out light tubes (with dimmer knob) for discreet rack illumination, while the M-8Dx provides light tubes as well as a laboratory-grade, front-panel digital voltmeter to monitor incoming voltage. The Merit X Series features better protection with a higher joule rating, increased noise filtration for a lower noise floor and a more robust chassis, with wall-wart outlet spacing on the rear panel to accommodate bulky power transformers.

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

Automatic mixing controller
Dan Dugan Sound Design

Model E-1: The Model E-1 automatic mixing controller helps professional audio mixers handle multiple live mics without having to continually ride their individual faders. This eight-channel signal processor patches into the input insert points of an audio mixing console. It detects which mics are being used and makes fast, transparent cross-fades, freeing the mixer to focus on balance and sound quality instead of being chained to the faders. The Model E-1's voice-controlled crossfades track unscripted dialogue perfectly, eliminating cueing mistakes and late fade-ups while avoiding the choppy and distracting effects common to noise gates. Without the need for gating, a natural low-level room ambience is maintained.

415-821-9776; www.dandugan.com
dan@dandugan.com

Dampening compound
Pinta Acoustic/Sonex

Prospec Decibel Drop: Prospec Decibel Drop, a high-performance viscoelastic damping compound, decreases the sound traveling to adjacent rooms. It is easy to install between layers of drywall, plywood or sub flooring in new and retrofit applications. This product offers exceptional damping properties and performance in low frequencies. It can be used on walls, floors and ceilings in new construction or retrofit applications. It is Class 1 fire rated.

800-662-0032; www.pinta-acoustic.com; sales@pinta-acoustic.com

Audio level controller
Audessence

ALPS-1: The ALPS-1 provides control of perceived loudness, dynamic range and peak level. The design is suitable for all situations where some combination of these three must be powerfully yet unobtrusively controlled. A truly versatile design, it is ideal for codec protection, satellite feeds, transmitter protection and remote broadcast site operations. The ALPS-1 brings consistency to all program streams without erasing musical dynamics, ends listener annoyance from over-loud segments such as commercials and shouting DJs, improves audibility and clarity of program, eliminates overload distortion and damage forever, eliminates the inconvenience of unauthorized tampering with front-panel controls and maintains program path reliability.

+44 1444 880 444; www.audessence.com

IP ecosystem
Digigram

IQOYA: Digigram's IQOYA series of IP audio hardware equipment and software solutions includes Call, Link, Serv, VCall, VMote, and VCast. Call is a two-channel IP audio contribution codec with SIP; Link is a two-channel IP audio distribution codec; Serv is a multi-channel versatile IP audio server; VCall is a soft IP audio contribution coded with SIP; VMote is an IP audio remote contribution with SIP; VCast is an intranet IP audio distribution software suite. More than just a point-to-point transport solution, IQOYA devices and software constitute the elements of a highly flexible and manageable professional IP audio infrastructure for contribution, delivery and distribution. An agile IP audio infrastructure allows broadcasters to adapt to quickly changing program content needs. IQOYA products are based on FluidIP, a N/ACIP-compliant IP audio codec engine developed by Digigram. This provides interoperability with third-party IP codec devices, while adding unrivalled robustness, QoS optimization, stream integrity and audio quality.

703-875-9100
www.digigram.com
input@digigram.com

GALLERY

CLASSIFIEDS

FOR SALE

Radio
THE RADIO TECHNOLOGY LEADER

www.RadioMagOnline.com • radio@penton.com

Editor – Chriss Scherer, CPBE CBNT, *chriss.scherer@penton.com*
Technical Editor, RF – John Battison, P.E., *batcom@ohio.net*
Associate Editor – Erin Shipps, *erin.shipps@penton.com*
Senior Art Director – Michael J. Knust, *mike.knust@penton.com*
Art Director – Robin Metheny, *robin.metheny@penton.com*
Sr. Online Audience Development Manager – Brad Erpelding, *brad.erpelding@penton.com*
Online Audience Development Manager – Zach Smoot, *zach.smoot@penton.com*

Technical Consultants
Harry C. Martin, *Legal*
Kevin McNamara, CNE, *Computers and Networks*
Mark Krieger, CBT, *IBOC and Contract Engineering*
Russ Berger, *Broadcast Acoustics*
Donald L. Markley, P.E., *Transmission Facilities*

Division VP & Group Publisher – Jonathan Chalon, *jonathan.chalon@penton.com*
Marketing Director – Kirby Asplund, *kirby.asplund@penton.com*
Marketing Coordinator – Crystal Shires, *crystal.shires@penton.com*
Vice President of Production – Lisa Parks, *lisa.parks@penton.com*
Senior Director of Production – Curt Pordes, *curt.pordes@penton.com*
Group Production Mgr. – Melissa Langstaff, *melissa.langstaff@penton.com*
Production Coordinator – Steven Kapp, *steven.kapp@penton.com*
Classified Ad Coordinator – Me'issa Scheffler, *melissa.scheffler@penton.com*
VP Audience Marketing – Jerry Okabe, *jerry.okabe@penton.com*
Audience Marketing Dir. – Barbara Kummer, *barbara.kummer@penton.com*
Audience Marketing Mgr. – JoAnn DeSmet, *joann.desmet@penton.com*

MEMBER ORGANIZATIONS
Sustaining Member of:
- Acoustical Society of America
- Audio Engineering Society
- Society of Broadcast Engineers

Member: American Business Media, The Missouri Association of Publishers

A PENTON MEDIA PUBLICATION

Penton Media

Penton Media, Inc.
249 West 17th Street
New York, NY 10011

Chief Executive Officer – John French, *john.french@penton.com*
Chief Revenue Officer – Darrell Denny, *darrell.denny@penton.com*

SUBSCRIPTIONS: Free and controlled circulation to qualified subscribers. Non-qualified persons may subscribe at the following rates (Prices subject to change): USA and Canada, 1 year, $66.00, 2 years, $116.00, 3 years, $165.00. Outside the USA and Canada, 1 year, $83.00, 2 years, $149.00, 3 years, $215.00 surface mail (1 year, $127.00, 2 years, $237.00, 3 years, $347.00 airmail delivery) For subscriber services or to order single copies, write to Radio magazine, 2104 Harvell Circle, Bellevue, NE 68005 USA; call 866-505-7173 or 402-505-7173; or visit RadioMagOnline.com.

POSTMASTER: Send address changes to Radio, P.O. Box 2100, Skokie, IL 60076-7800 USA.

ARCHIVES & MICROFORM: This magazine is available for research and retrieval of selected archived articles from leading electronic databases and online search services, including Factiva, LexisNexis, and Proquest. For microform availability, contact National Archive Publishing Company at 800-521-0600 or 734-761-4700, or search the Serials in Microform listings at napubco.com.

REPRINTS: Contact FosteReprints to purchase quality custom reprints or e-prints of articles appearing in this publication at 866-436-8366 (219-879-8366 outside the U.S. and Canada). Instant reprints and permissions may be purchased directly from our website; look for the RSiCopyright tag appended to the end of each article.

PHOTOCOPIES: Authorization to photocopy articles for internal corporate, personal, or instructional use may be obtained from the Copyright Clearance Center (CCC) at 978-750-8400. Obtain further information at copyright.com.

PRIVACY POLICY: Your privacy is a priority to us. For a detailed policy statement about privacy and information dissemination practices related to Penton Media, Inc. products, please visit our website at pentan.com.

EDITORIAL and BUSINESS OFFICE: Penton Media, Inc. 9800 Metcalf, Overland Park, KS, 66212; 913-341-1300; RadioMagOnline.com, penton.com.

List Rental Services - Curvin Lovejoy
Curvin Lovejoy
Phone: 845-732-7262
Fax: 845-620-1885
curvin.lovejoy@walterkarl.infousa.com

Editorial Reprints
Penton Reprints
Phone: 888-858-8851
Website: www.pentonreprints.com
E-mail: reprints@pentonreprints.com

Sales Offices

National Sales Director
Steven Bell
Phone: 913-967-7221; Fax: 913-514-6848
E-mail: steven.bell@penton.com

Europe/UK
Richard Woolley
Phone: +44 1295 278 407
Fax: +44 1295 278 408
E-mail: richardwoolley@btclick.com

Classified Advertising
Joyce Nolan
Phone: 610-701-9993; Fax: 610-701-0580
E-mail: joyce.nolan@penton.com

Online Sales & Marketing
Angie Gates
Phone: 913-967-7516; Fax: 913-514-7516
E-mail: angie.gates@penton.com

Contributor Pro-file

Meet the professionals who write for *Radio* magazine. This month: Field Report, page 52

Todd Feinburg Host of the* Todd Feinburg Show, *WRKO Boston

Todd Feinburg hosts the nationally syndicated *Todd Feinburg Show*, which launched in 2003. Feinburg has spent the last five years at WRKO in Boston. Before entering talk radio, he worked as a newsman, music announcer and helicopter traffic reporter. He also co-owns fine dining Italian restaurants in the Boston suburbs with his wife. Feinburg also consults on the implementation of Internet-based broadcast tools.

Radio
THE RADIO TECHNOLOGY LEADER

Written by radio professionals
Written for radio professionals

Radio, Volume 14, Number 6, ISSN 1542-0620 is published monthly and mailed free to qualified recipients by Penton Media, Inc. 9800 Metcalf, Overland Park, KS 66212-2216 (www.penton.com). Periodicals postage paid at Shawnee Mission, KS, and additional mailing offices. Canadian Post Publications Mail Agreement No. 40612608. Canada return address: Bleuchip International, P.O. Box 25542, London, ON N6C 6B2. Additional resources, including subscription request forms and an editorial calendar are available online at www.RadioMagOnline.com. To order single copies call 866-505-7173 or 402-505-7173.

POSTMASTER: Send address changes to Radio, P.O. Box 2100, Skokie, IL 60076-7800 USA.

ADVERTISER INDEX

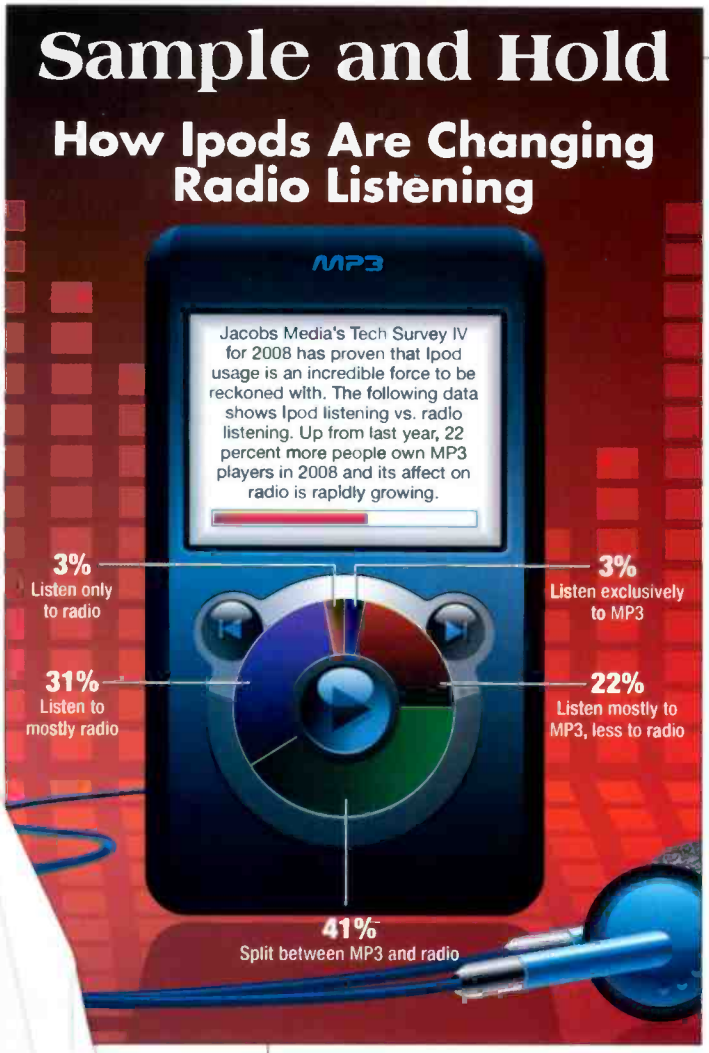
This index is a service to readers. Every effort is made to ensure accuracy, but *Radio* magazine cannot assume responsibility for errors or omissions.

by Erin Shipps, associate editor

That was then

These photos were sent to us by Steve Dresser, chief operator at KMPH-TV 26, Fresno, CA. Dresser's current employer owned KFRE 940 Fresno for a few years in the 1990s. The first photo is the KFRE transmitter room in the early 1950s. The 50kW General Electric BT-25-A that went on the air in 1949 can be seen. It shows the four-tower system phasor cabinet that is still in use and the transmitter control desk. Like many AM radio stations in the 1930s, 940 Fresno started as a 250W station on a different frequency. Over time it evolved into the only 50kW AM station from Bakersfield, CA, to Stockton, CA. Current call letters on 940 are KWRU. The station is on the air with a Harris DX-50 50kW transmitter with a Harris MW-50 50kW transmitter as a backup.

Dresser also sent us two photos of WPTR 1540 Albany, NY's, "Golden Studios." AM 1540 first signed on the air in 1948 with 10kW of power. In 1953, the station gained network affiliation with ABC and increased to 50kW. After a fire in 1964 damaged the inside of the studio building, a new 10,000-square-foot broadcast facility was constructed at the transmitter site, and programming originated from what became known as the Golden Studios until 2005 when the building was demolished. Programming now originates from new digital facilities inside the transmitter building. WPTR calls are now on 96.7 FM in Albany and 1540 is still on the air but with different calls.



Source: Jacobs Media, Tech Survey IV, 2008

E² Ethernet Audio Done Right

MEET THE SQUARE

The Wheatstone E² (E SQUARE) gives you the convenience of Ethernet audio without all the IP hassle. It just *knows*. The built-in Setup Wizard lets you configure an entire system with just your browser and a laptop. Unplug it when you're done and there's no PC between you and system reliability.

SQUAREs are totally scalable: use one as a standalone 8x8 studio or transmitter site router, with browser access from anywhere. Plug two together and have a standalone digital snake. Add a fanfree mix engine and build yourself a studio using analog and digital I/O SQUAREs.

All the power is *in* the SQUARE. Distributed intelligence replicates all configuration data to every unit. Profanity delay and silence detection are done *in* the SQUARE. Even virtual mixing (w/automation protocol) —it's *in* there; all with real front panel meters, 32 character status indicators and SNMP capability.

88D I/O: 8 digital inputs and outputs. You can headphone monitor and meter any of the SQUARE's inputs or outputs in real time. The 32 character display gives you all the information you need about your audio and system configuration. And because you can operate in either 8-channel stereo or 16-channel mono mode, 16 channels of metering are provided.

88E DIGITAL ENGINE: Just plug an E-SERIES control surface or GLASS E computer interface into this engine and get all the mixes, mic and signal processing you need. Fanfree, so it can stay in the studio where it belongs.

88A I/O: 8 analog inputs and outputs. You can bring a new SQUARE up in seconds and of course use the front panel encoder for your X-Y control. Front panel status LEDs give you continuous link, status, and bit rate information as well as confirmation of any GPIO activation.

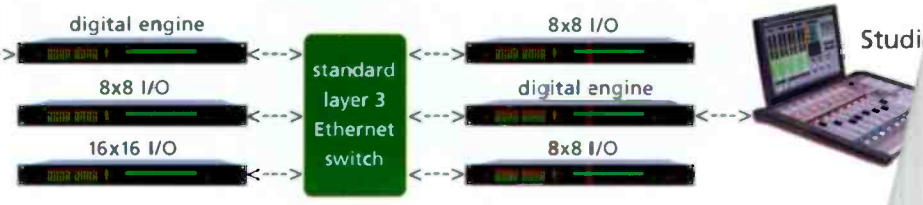
88AD I/O: 4 analog plus 4 digital inputs and outputs—perfect for small studios or standalone routing.

88 I/O CONNECTIONS: E² has both DB-25s for punchblock interface and RJ-45s for point-to-point interface. All SQUAREs have 12 individually configurable opto-isolated logic ports that can be either inputs or outputs.

Because the E² system doesn't rely on a third party GUI, tech support is straightforward (and 24/7). Likewise, system operation doesn't require external PCs for continued full functionality. Best of all, 1 Gigabyte protocol eliminates the latency and channel capacity restrictions associated with older technology.

E-SQUARE is Ethernet audio done RIGHT!

STUDIOS DONE EASY!



www.wheatstone.com

Wheatstone

AIR WARRIOR

A modern air warrior needs all of the power and control he can muster to bring to the battle. **When it's you against the other guy, the VORSIS AP-2000 has it ALL.**

NOT AN ACE YET? The AP-2000 comes preloaded with over 70 presets tuned to do battle. Try a test flight with the latest VORSIS 31-band digital processor—and join the broadcast elite!

Wes Davis
Jim Hibbard
Owen Martin
Chip Morgan
Matt Lightner
Jim Loupas
Bruce Roberts
Floyd Turner

VORSIS®

AP-2000
DIGITAL SPECTRAL PROCESSOR

www.vorsis.com