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Radio

THE RADIO TECHNOLOGY LEADER

2013 NAB Show

MARCH 2013 RADIOMAGONLINE.COM

NewBay Media

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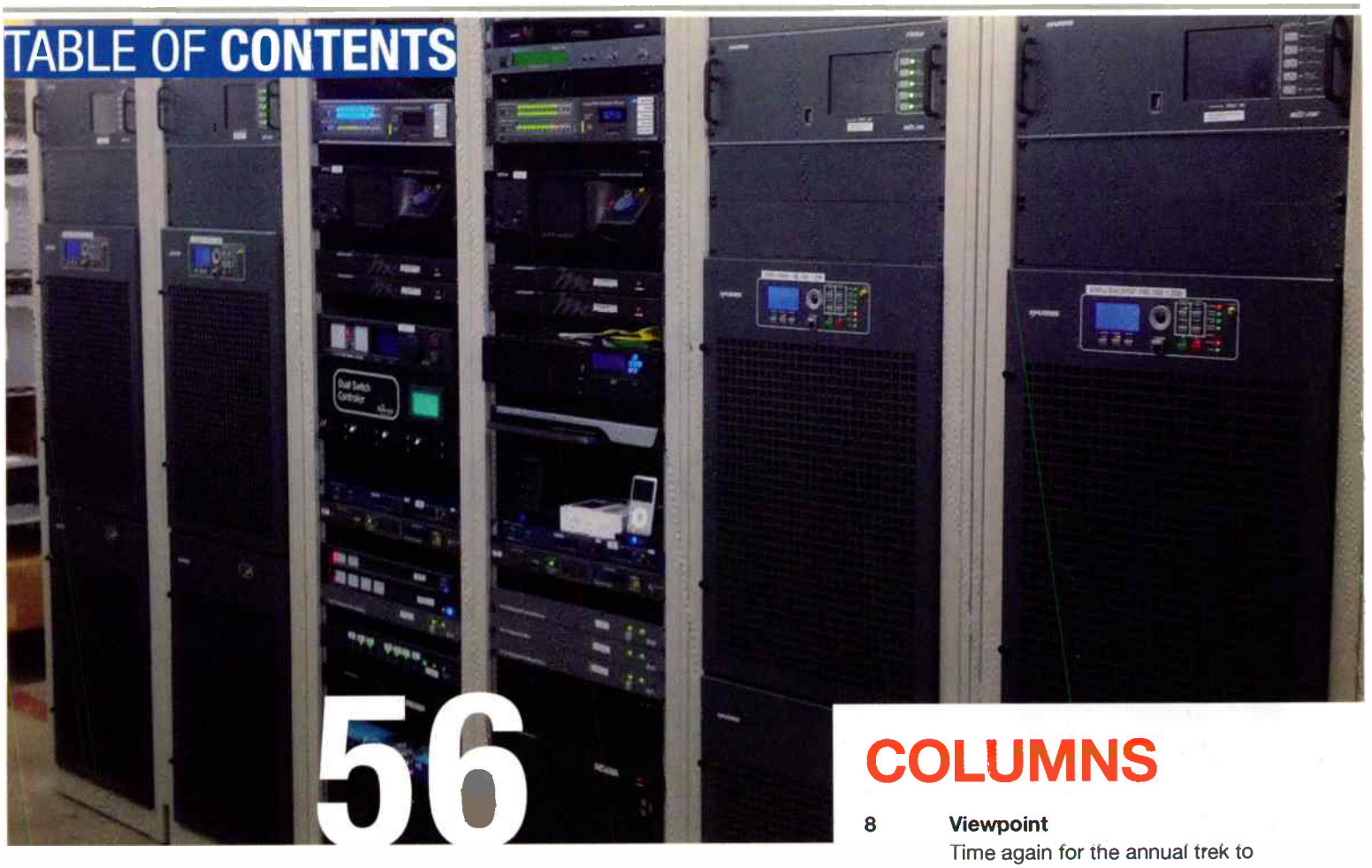

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Radio Revenue Up for Third Straight Year

Radio ended 2012 on a high note with 4Q2012 revenue up 4 percent over 2011 comps, to $4.349 billion. This was the highest growth recorded over the past eight quarters and since the strong rebound gains registered throughout 2010. Full-year spending was up for the third consecutive year and totaled $16.482B (+1 percent). The Radio Advertising Bureau credits the resurgent success of the auto industry and the presidential election as the main impetus for the positive performance.

REVENUE COMPARISONS - 2012 VS. 2011

Revenue	$4Q2012	% Change	$FY 2012	% Change
Spot	3,750	4	14,205	1
Digital	206	11	767	8
Off-Air	393	-1	1,510	1
Grand Total	4,349	4	16,482	1

Revenue in millions. Source: Miller Kaplan Arase

Cisco reported 2012 world mobile Web stats. All data usage specs are up. Check out Sign Off on page 74 for more.

Crown Broadcast will now sell Ecreso Transmitters. As part of the deal, the E Series transmitter will be added to the Crown line.

Don Backus has been appointed eastern region sales manager for Broadcast Electronics. He previously represented Commotion, a Broadcast Electronics company, as vice president of global market development. He will continue his efforts with Commotion.

FCC Chairman Julius Genachowski will sit for a question and answer conversation with NAB Joint Board Chair Paul Karpowicz at the 2013 NAB Show.

CBI Calls for Presentations for 2013 National Student Electronic Media Convention

The CBI board of directors is now accepting session proposals for the second annual National Student Electronic Media Convention, to be held Oct. 31 - Nov. 2, 2013 at the Hyatt Regency San Antonio on the Riverwalk. The convention brings students, advisers and staff from college radio and television stations across the country for three days of informative sessions, exhibitions and special sessions on all aspects of college broadcasting. Past session topics have covered a wide variety of topics, including FCC regulations, webcasting, legal issues, management and leadership, social media and more.

The conference also includes the annual National Student Production Awards to honor the best work in television and radio production from students across the country. "CBI encourages any and all to share their expertise with a crop of students who have an expressed interest in media in order to help them better understand the world beyond college media, improve their current efforts and how they can benefit and contribute to the future of any aspect of electronic media," said CBI Executive Director Will Robedee. "If you think you have something to offer the next generation of broadcasting professionals, we want to hear from you."

Media professionals, students, advisers and legal professionals are invited to submit proposals, and preference is given to proposals with more than one speaker. Sessions proposals are being accepted through Aug. 15, 2013 at www.askcbi.org/sanantonio/sessions-and-programming/.

NPR Labs to Test Emergency Alerts for Deaf and Hard of Hearing

NPR Labs has been awarded a contract from the U.S. Department of Homeland Security (DHS) and the Federal Emergency Management Agency (FEMA) to demonstrate the delivery of emergency alerts to people who are deaf or hard-of-hearing in the Gulf Coast states through local public radio stations and the Public Radio Satellite System (PRSS). This is the first effort to deliver real-time accessibility-targeted emergency messages, such as weather alerts, via radio broadcast texts.

This pilot system is intended to demonstrate that all individuals, including those who are deaf or hard-of-hearing, can rely on battery-powered radios to stay informed in emergencies when electricity, Internet and other communications channels are unavailable.

NAB Show, NewBay Media Create Connect 2 Media & Entertainment

Connect 2 Media & Entertainment (Connect 2 ME) is a new year-round news and information source and online community for media and entertainment professionals. Inspired by the NAB Show and produced in partnership with NewBay Media, publisher of Radio magazine and many other broadcast and technology publications, Connect 2 ME is a socially enabled digital gateway where NAB Show attendees, exhibitors and the media and entertainment community at large can access content via a website, frequent e-newsletters, social media and mobile/tablet editions.

FIND THE MIC AND WIN!

Tell us where you think the mic icon is placed on this issue's cover and you could win a 3-pack of Hosa HMIC-025 mic cables . Send your entry to radio@RadioMagOnline.com by April 10. Be sure to include your guess, name, job title, company name, mailing address and phone number. No purchase necessary. For complete rules, go to RadioMagOnline.com

Announcing the new MOSAIC

Logitek's flagship console is now even better with enhanced styling and functionality.

Updated for use with today's advanced audio streaming and networking technologies, the Mosaic gives you fast, easy access to sources and smooth, consistent operation no matter where it's used.

The Mosaic provides anywhere from four to 24 faders in a durable, attractive tabletop enclosure that can be placed anywhere or moved out of the way when not needed. OLED screens are used throughout the console and have been added to the Softkey module for easier source selection. We've made access to controls more intuitive and have illuminated key controls for use in any type of studio lighting.

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VIEWPOINT

Another Year, Another Convention

A crowd of nearly 100,000 people converge on a town in the middle of the desert…

That's not the setup for a joke or a novel, it's what many broadcasters will do next month. The 2013 NAB Show will draw us together just as it has in previous years to discuss everything broadcasting and electronic media. We'll skip the feeling of déjà vu and the comments of "Didn't we just wrap up the 2012 convention?"

So what's on the agenda this time? Lots of new products, more sessions than ever, several high-profile speakers, and an expanded convention scope. The convention itself extends beyond broadcasting, and I hear comments every year that ponder if the convention is forgetting its broadcast roots. I think broadcasting is still firmly at the center of the event. The allied industries represented in the sessions and on the exhibit floor add to the experience and in many ways can enhance the educational aspect.

As in the new normal, the radio and pro audio areas are in the front of the Central Hall. We who focus on radio find this convenient for the easy access to the South Hall session rooms where the Broadcast Engineering Conference sessions are held, but it's also easy to get to the North Hall meeting rooms. And it's obviously between the other two halls, which reduces some of the distance I have cover to see the exhibits that apply to radio but aren't in the Radio Hall.

What is there to see this year? This issue is full of information to help you find your way at the 2013 NAB Show. We have assembled a collection of new products that will be unveiled this year in our new products coverage. From the mic to the antenna or streaming server, you'll find plenty of new things to see on the exhibit floor.

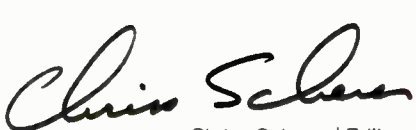
You can plan your stops ahead of the convention with our annual pull-out Radio Hall map, which is included in this issue. This includes an exhibitor index to find who you need to see.

The exhibits are big, but they're not the only focus of the convention. The Broadcast Engineering Conference begins on Saturday with the Society of Broadcast Engineers Ennes Workshop. The theme this year is Alternative Delivery: How to Make it Work. If you usually arrive on Sunday, see if you can get to Las Vegas earlier so you can attend all the Broadcast Engineering Conference sessions.

The remainder of the BEC covers new and emerging technology, HD Radio, regulatory issues, emergency operations, datacasting and and several other topics. The wide range of information is sure to appeal to you in some way. We've created a condensed session timetable for you in our convention preview as well.

But there are some sessions outside the Broadcast Engineering track that may interest engineers. On Monday at 1 p.m. I will moderate a session in the Broadcast Management Conference called Top Radio Technologies You'll See on the Floor. Tom Atkins, Jim Paluzzi and Norm Philips are part of the discussion to highlight new technologies being shown at the exhibit floor.

Ongoing reports show that radio revenues are up, and the economy has positive indicators. It's likely the convention attendance figures will rise again this year. Perhaps I'll see you at the convention.



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

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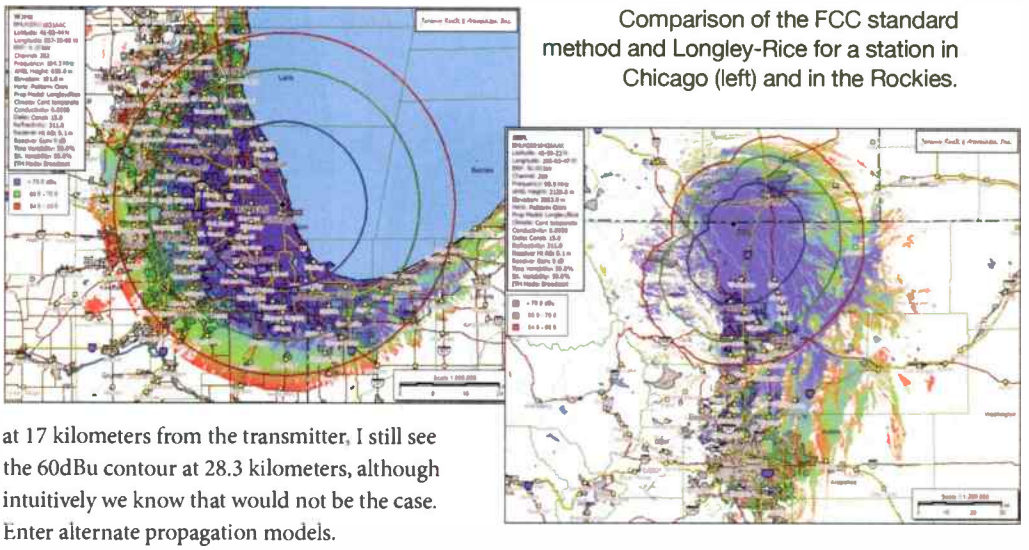
Alternate Propagation Models

by Jeremy Ruck, PE



Comparison of the FCC standard method and Longley-Rice for a station in Chicago (left) and in the Rockies.

Prior to the ubiquity of substantial computing horsepower, we had to more or less rely solely on the Commission's standard contour methodology for prediction of coverage. Don't get me wrong, this method works well in many cases. Indeed, the Commission designed the method to be reasonably accurate over a fairly broad slice of circumstances that exist in the United States. That being said, like anything else, it tends to fall apart at the margins—those situations in which terrain is abnormally smooth or cases where a particular propagation path has some fairly significant undulations. Even in the great flat Midwest, a place I affectionately call home, the standard contour method does not necessarily provide the full picture of what is transpiring.

The limitations in these spheres result from the basic construct of the model. The contour method samples terrain at discrete increments along a given path from 3 to 16 kilometers from the transmitter, and then finds the average of these individual quantities. This average is then applied to either the F(50,50) or F(50,10) curves, depending on whether coverage or interference is sought, resulting in a derivation of the distance to the particular contour. If the variation in the elevations along this path is around 50 meters, plus or minus 25 meters or so, then a reasonable approximation of the field strength is obtained. It is important to remember that the model is statistically based, and as such, really only says that at fifty percent of the locations within the contour at 50 percent, or 10 percent, of the time, the desired field strength will be achieved.

Carrying this a step further consider a generic class A facility. If we assume that the ERP of this facility is 6kW, the center of radiation is at 100 meters above average terrain, and that the terrain is perfectly uniform within the 3-16 kilometer range, then the 60dBu contour will lie at a radius of 28.3 kilometers form the site. But if I were able to construct a substantial concrete wall at 17 kilometers from the transmitter, I still see the 60dBu contour at 28.3 kilometers, although intuitively we know that would not be the case. Enter alternate propagation models.

Although there are several different ways of approaching this problem, I will concentrate on the Longley-Rice model. The Longley-Rice model differs from the FCC contour method in that it predicts the field strength at a given pixel, or cell, instead of deriving an average contour. If, like the FCC staff, you prefer using contours, one can still be constructed using Longley-Rice, but by so doing, the subtleties and wealth of information provided by Longley-Rice is watered down.

RUNNING NUMBERS

Because Longley-Rice calculates the field strength for a given cell, it looks at the terrain along the path as well as localized conditions in the vicinity of the cell. For an accurate prediction, one where localized subtleties are fully considered, a cell size on the order of 100 meters may be desirable. If 360 radials out to 150 kilometers are considered, then more than half a million different locations have to be considered, sampled, and calculated. Even on a robust platform, this takes a reasonable amount of time and consumption of resources. It seems logical that for this reason, as well as the ability Longley-Rice offers to skew results, the Commission, at least in the Audio Division, has historically shied away from permitting widespread use of Longley-Rice.

Once computing power got to the point where most consultants were able to easily run such predictions with regularity, the inevitable happened. Everybody tried using Longley-Rice for most circumstances, which not only overloaded the OET guys, but also resulted in a growing lack of consistency in showings. In 2003, an unpublished letter issued by the Commission reined in the use of Longley-Rice by laying out specific criteria that must be demonstrated for its use. Among these was a demonstration that Longley-Rice demonstrated coverage at least 10 percent larger than the standard method, as well as the necessity of demonstrating that the variation in terrain (delta-h) from the transmitter to the city of license is less than 20 meters or greater than 100 meters. Although unpublished, every consultant has a copy of this letter, which served as the basis for Longley-Rice use for the next several years.

Now under the *Skytower* decision, released in 2010, the Commission has liberalized the use of supplemental methods. Gone is the delta-h requirement. It has been replaced with a simple demonstration that the 70dBu contour distance exceeds the predicted standard distance by at least 10 percent. It is important to note that supplemental showings pertain only to city-grade field strengths, and by extension apply only to prediction of coverage over the

city of license or compliance with the main studio rule. The protected contours for the various classes of FM facilities must still be determined through the use of the standard method.

At some point in the not-too-distant future, the Commission is expected to become better equipped to handle supplemental showings without referral to the OET. What that means for future use of alternate methods is somewhat murky, but the hope is that a standard set of study parameters will be released to the engineering community so everybody winds up on the same page. This will of course reduce the necessity of conflicting interpretations, thereby conserving the limited resources available to the staff.

As I previously mentioned, Longley-Rice lends itself to some fairly wide variations in how the model can be tweaked. For instance, at what height should the receive antenna be considered? The curves were developed with a receive antenna height of 9.1 meters, or 30 feet AGL. Obviously a varying receive heights will yield different field strengths. Similarly, what receive antenna gain should be considered? Is 0dBd appropriate, or is a different value, perhaps more representative of mean antenna gain, a better illustration?

By the same token, how should we address the impacts of localized groundcover? Without delving very deeply into the esoteric mathematics of the model, one can intuitively understand that in a very dense urban environment, the field strength would be expected to be lower due to many more objects "soaking" up the signal. Finally, even the atmospheric conditions in a particular locale will have a bearing on the predicted coverage. Coverage in desert environments such as Phoenix is treated differently than in Chicago, with the latter environment resulting in a larger footprint.

I'll share two coverage examples illustrating a comparison between the FCC standard method and Longley-Rice. The first illustrates the coverage of one of the FM stations in Chicago. The colored shading underneath illustrates the Longley-Rice predicted signal levels, with FCC derived contours overlaid. The second illustration demonstrates coverage for a station in the area of the Rockies. The effect of terrain is quite obvious in this instance.

Within the past several years alternate methods of propagation have grown in popularity. Our friends on the video side of things now rely quite heavily on Longley-Rice in the digital world. While there is little doubt that the use of alternate methods will continue to grow with time, the contour method will likely never disappear entirely. So for the immediate future, alternate methods will continue to be most illustrative for engineers, owners, and programmers, but will probably remain somewhat of a science fair project, and perhaps rightly so, from the vantage point of the Commission.

Ruck is a senior engineer with D.L. Markley and Associates, Peoria, IL.

Equipment Authorization Rules Redux

by Lee Petro

On Feb. 15, the FCC released a Notice of Proposed Rulemaking to adopt new rules for its equipment authorization procedures. The proposed changes are expected to encourage greater efficiency in approving new radio frequency (RF) equipment, while maintaining the existing protections from these devices causing harmful interference.

By way of background, the Commission currently has three different approval procedures for new and modified equipment, depending on the potential for harm. The most basic procedure, verification, involves only the manufacturer. Under this authorization framework, the manufacturer reviews the technical standards established by the FCC, makes the necessary measurements and takes other steps to confirm that the equipment complies with the FCC's rules. Manufacturers are required to maintain documentation regarding their equipment testing, and may be required to supply a sample unit or test data to the FCC upon request. The second procedure, declaration of conformity, requires equipment to be tested by an accredited testing laboratory. These accredited laboratories test the equipment to ensure that it complies with the appropriate technical standards. Finally, the third procedure, certification, is the most stringent of the authorization processes, and requires that equipment be sent to the FCC or a designated telecommunications certification body to be tested and approved. A telecommunications certification body (TCB) is a laboratory approved by the FCC, which is authorized to process and approve equipment under specified certification procedures.

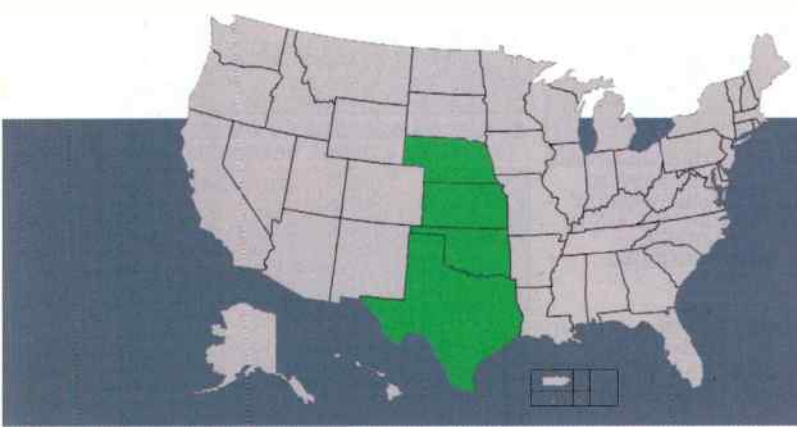
The proposed rules take aim at revising the certification procedure, and adjusting the relationship between the TCBs and the FCC. First, the FCC proposes to cease reviewing equipment, and instead have TCBs conduct all routine certification applications. The Commission believes that this would eliminate delay, and free its limited resources to spend more time confirming that its rules are being applied correctly. The Commission also proposes to eliminate the Exclusion List that required the FCC (rather than a TCB) approval of certain equipment, such as TV band white space devices and split modular transmitters. Instead, the Commission proposes to create a pre-approval guidance procedure" whereby the TCB would first review the device, and then forward its recommendation to the FCC. The FCC would then either approve the device, request additional information from the TCB, or deny the application.

The Commission also proposes to modify the TCB oversight process. Under its current rules, the FCC can only terminate the TCB's authority to review applications, and the FCC believes that intermediary steps, such as heightened reporting requirements may be a more useful in ensuring compliance. Under the proposal, the FCC would first give the TCB notice that the FCC has concerns about the TCB's approval process, and provide a period of time for the TCB to modify its approval policies and bring the TCB back into compliance. The FCC would monitor all grants of authorizations by the TCB, and set aside such grants if necessary. Moreover, the FCC proposes to require that all TCBs become accredited under the ISO/IEC 17025 standards that are applicable currently to just those sites that are eligible to issue a declaration of conformity. The FCC believes that the costs associated for TCBs to become accredited will likely be offset by the certainty that equipment is being adequately tested.

Finally, the FCC proposes to tweak its Part 15 rules relating to intentional and unintentional radiators. Currently, Part 15 specifies a standard published by the American National Standards Institute (ANSI) adopted in 2003. In light of the technological advances to devices, there have been updates to the ANSI standards. Therefore, the FCC proposes to incorporate ANSI C63.10-2009 into its rules for determining compliance with intentional radiators, and ANSI C63.4.2009 for unintentional radiators.

Comments on the FCC's proposals will be due 45 days after the NPRM is published in the Federal Register.

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



DATELINE

March 16: Stations in Kansas, Nebraska, and Oklahoma continue running License Renewal Post-Filing Announcements on March 16, April 1 and 16. Stations in Texas continue running License Renewal Pre-Filing Announcements.

April 1: Stations in Texas file License Renewal Application and EEO Program Report, and Noncommercial radio stations file Ownership Report (323-E). Commence running License Renewal Post-Filing Announcements, continuing on April 16, May 1 and 16.

April 10: Stations place Issues/Programs Lists for 1Q2013 into public inspection file.

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Somewhere in this, the Emerald City, there is an Intelligent Network with more than a million crosspoints connected through a 1,232 x 1,232 audio matrix shared between 21 studios and seven stations, all via AoIP running at gigabit speed. The equipment tally so far: 77 Wheatstone IP88a BLADE access units with 15 Wheatstone control surfaces, 12 crosspoint controllers, three Producer Turrets, 43 Headphone Panels, 23 Mic Control Panels and 45 Mic Processors. Still to come are at least seven more IP88 Blades, 17 mics, 17 headphone panels and 17 mic processors.

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pictured: Wheatstone LX-24

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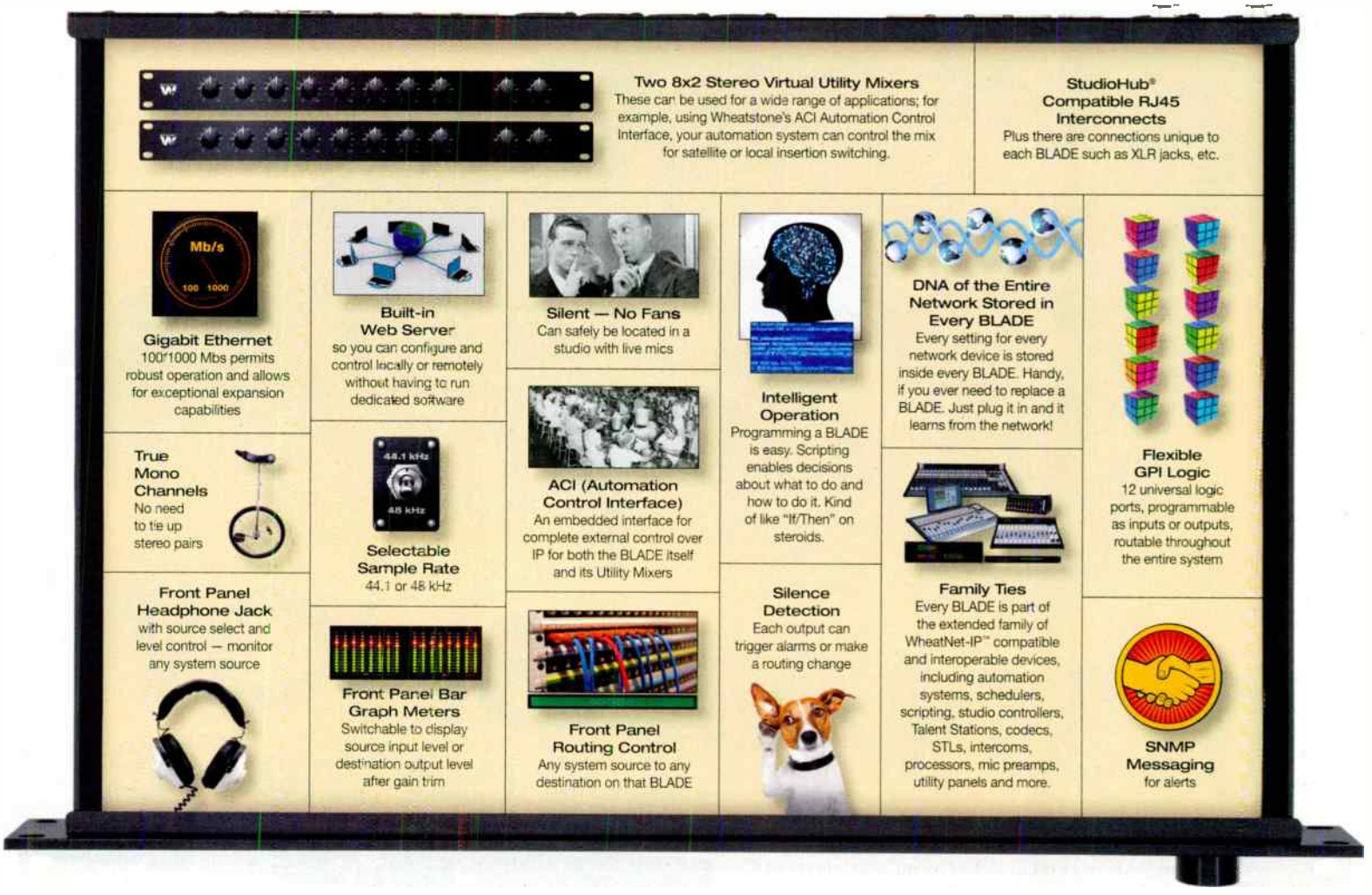

Each BLADE on the Intelligent Network is exceptionally powerful... but do you know about the incredible functionality inside *EVERY* BLADE?

By now, it's a good bet you're aware of the WheatNet-IP Intelligent Network. You know about its advantages - how it's obsessively compulsive about redundancy. How it can repair itself, configure itself, run rings around the competition while still having much greater bandwidth (due to its Gigabit Ethernet throughput) - enough, in fact, to not only handle our increased functionality today, but well into the future.

So we figured it's time to let you know a little more about those boxes you plug into the Intelligent Network. The ones that contribute to its intelligence. They're called BLADES and from inception have been far more advanced than any boxes on any other networks out there. Take a look and consider how you'd put all that to work in YOUR WheatNet-IP system.

WHEATNET-IP: THE INTELLIGENT NETWORK

Wheatstone

2013 NAB SHOW®

We'll Get You There!

New Products • Map • Sessions

The NAB Show is our largest broadcasting event of the year, and it continues to grow. But it's not just broadcasting; It's become the electronic media gathering. There's so much to see at the convention—HD Radio, streaming, handheld devices and apps, crowdsourcing, RDS, IP everything—your attention is pulled in multiple directions.

The show floor is only part of the experience. The Broadcast Engineering Conference has topics that cover every aspect of radio. And there's more to be learned in sessions in other conferences.

All this said, to make the best of your time at the convention, you must plan ahead. And that doesn't mean browsing some info on the plane before you land. That's why we put our convention preview together in the March issue.

Our preview of new products gives some insight as to the new technology you'll see on the exhibit floor. And we continue to receive more new product info after this issues is printed, so be sure to also look for our NAB Insider email newsletter.

As you discover what you want to see on the floor, plot your course quickly on the Radio Hall map.

And take in a session or two or more. The Broadcast Engineering Conference radio session overview gives you a quick scan of what's being presented.

See you in Las Vegas.

Chriss Scherer, editor

Remote control meter interface | Burk Technology

PlusConnect BDI DPS-100D: This interface allows the Burk ARC Plus to connect directly to the Broadcast Devices DPS-100D power meter. The unit links up to four BDI power meters to an ARC Plus using an existing network connection. By eliminating the need for parallel wiring, the PlusConnect allows broadcasters to better leverage their investment in remote control and power monitoring equipment.

burk.com

Mobile broadcast app | Mayah Communications

MOBI: This mobile broadcast OPUS iOS client for iPhone offers bi-directional real-time audio transmission between iOS clients or between an iOS client and a Mayah hardware audio codec, such as Centauri III (stereo), C11 (mono), C10 (stereo). In operation, the audio experience feels highly natural with delay almost down to zero. OPUS features an extremely short delay and is therefore suitable for all broadcast applications. Experiments have shown that OPUS via IP can be even better providing a lower latency compared with normal telephone communication.

mayah.com

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omt technologies

NABSHOW New Products

Broadcast console | Arrakis

ARC-15: The ARC-15 is a general purpose console. Channel one is a high performance mic channel while channels two-five are selectable as mic or line inputs. Channel 15 is an advanced telephone interface to an external hybrid for live callers or an off-line contest call. Seven stereo line input channels easily handle the other audio sources, such as CD players. Channel 14 is selectable as either a Windows PC USB interface or an unbalanced stereo consumer level input. Windows software for live on air, automation, and production is provided standard. With 5 million operation, LED lighted, switches; long life faders; and electronic switching of all audio signal paths; the ARC-15 is a versatile console.

arrakis-systems.com

IP extender | Sonifex

Redbox RB-IPE: The RB-IPE has 16 general purpose inputs on eight RJ-45 connectors, consisting of eight isolated current sink inputs and eight pull to ground protected inputs; and 16 general purpose outputs on eight RJ-45 connectors using eight isolated relay change-over contacts and eight opto-isolated contacts. These rear-panel RJ45 connectors have an LED for each GPIO, which shows its state. On another set of eight RJ-45 connectors there are also eight 0 to 3.3V/5V/12V input signals and eight output signals nominally at 0 to 3.3V output, with other output voltage configurations possible. The outputs can all be controlled from the inputs of another RB-IPE, or from Ethernet commands, allowing any tallies and control signals, together with analog potentiometer movements, to be sent across a network. When two units are connected at different sites, if a general-purpose-input state changes at one site the unit sends the new state to the other site and the appropriate opto-isolator output changes on that unit. Similarly input voltage controls are monitored and the changing voltage is sent to the remote unit where an output voltage changes accordingly.

sonifex.co.uk

AES/EBU detector switcher | Davicom

AEDS: This digital audio detector and switcher has the capability of sensing errors and silences in the digital audio input stream and of automatically switching to a second AES signal or to a third analog source. Besides operating automatically, the AEDS can also be operated manually, either locally or remotely, through its rear panel parallel I/Os or through a USB connection. The AEDS has three inputs and one output: The first two inputs are digital audio inputs with automatic sensing of the data sampling rates. The third input can accept an analog audio source, which is internally sampled at 48kHz. The AES output sampling rate follows the input sampling rate.

davicom.com

iPad stand for video | The Padcaster

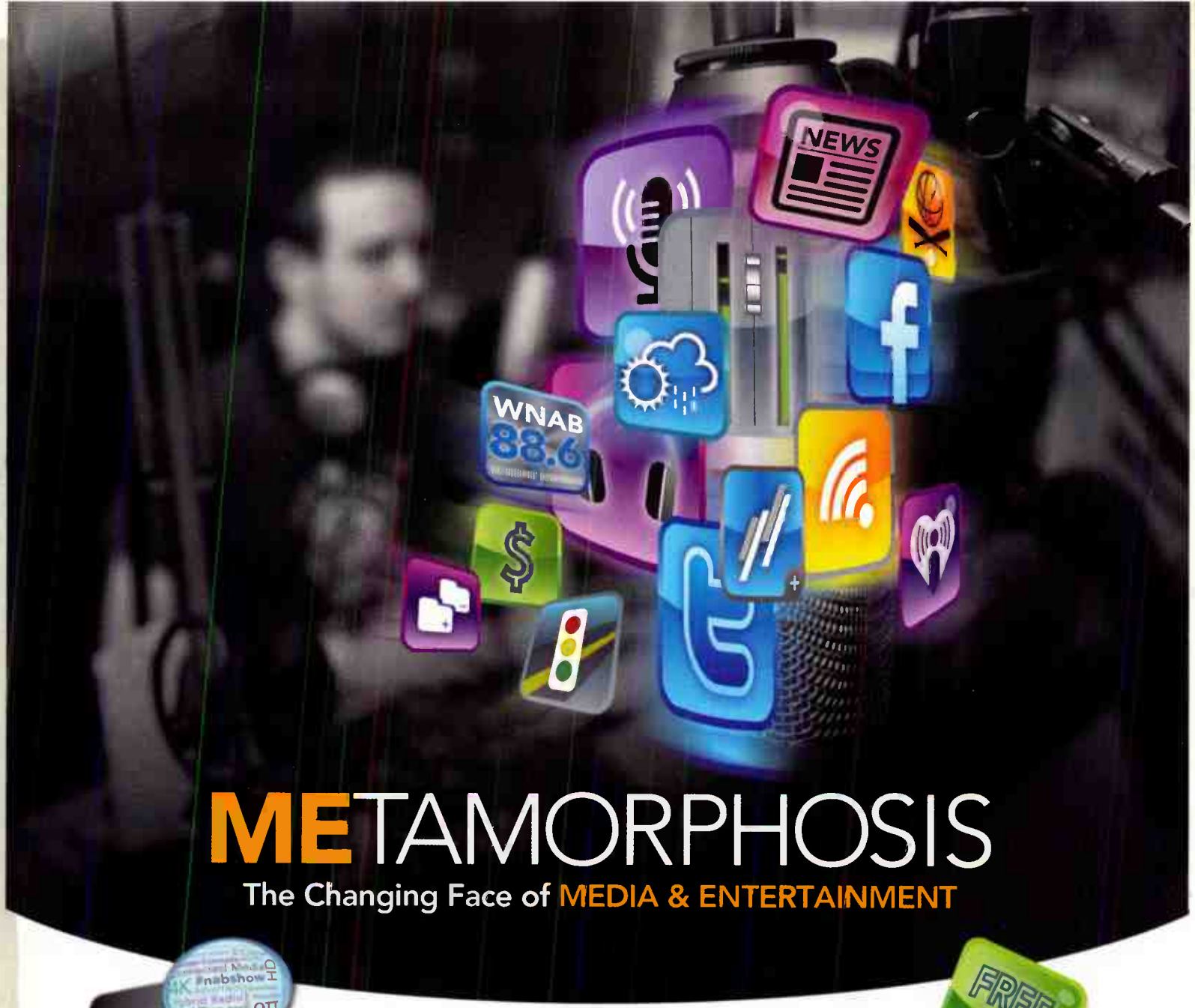
The Padcaster: The Padcaster transforms an iPad into an on-the-go production studio, providing an easy and professional way for users to create videos on the iPad, from storyboarding and shooting to editing and sharing. It features an aluminum frame with a urethane insert that snugly holds an iPad. Threaded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

thepadcaster.com

Webcasting studio | Streamstar

Webcast Case: This portable, live HD/SD webcast production tool includes: full-featured webcast production software; cut/cross-fade/transitions switching modes; instant replays with slow/fast motion playback; replays in/out animations; graphic overlays and inserts; PIP and split screen layouts; video clips and complex playlists playback; external signal capture over DVI with keying; built-in Streamstar Encoder; direct streaming to Internet and mobile devices; popular streaming platforms integration; HD recording of the production while streaming; second display multiview grid; HDMI video out; multi-system PAL/NTSC; audio mixer; built-in high-resolution, touchscreen HD display; briefcase-sized compact package; and full access to all internal components for easy service and upgrades.

streamstar.com



METAMORPHOSIS

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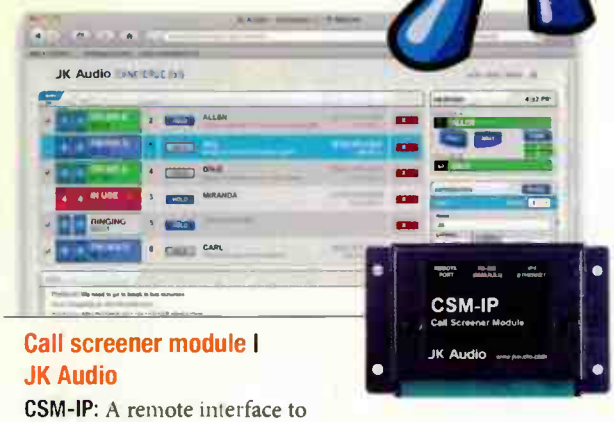
NABSHOW New Products



Call screener module | JK Audio

CSM-IP: A remote interface to the JK Audio Concierge talk show system, CSM-IP contains a Web server that allows remote control of the system through a Web browser. Remote control capabilities include: answer, hold and drop calls; call and hold timers; clear indication of call state and priority in queue; reset order of queue; set auto-answer by line; start and stop conference; text fields for caller name and location; chat between users; and save call logs.

jkaudio.com

Touch monitor | RTW

TMR7: Specifically designed for radio broadcasting, the four-channel desktop unit features twoAES3 digital (XLR) inputs, a 7" touch screen, and is available as a desktop unit or as an OEM unit with 16 audio inputs. Similar to the TM7, the TMR7 shows separate true peak and PPM instruments on each input channel as well as a vectorscope and correlator for evaluating stereo signals. Licensing options include an extensive loudness-meter implementation (EBU R128, ITU BS.1770-3/1771, ATSC A/85, ARIB) with graphical and numerical single-channel and summing views as well as loudness range (LRA), MagicLRA and SPL metering. Licenses are also available for an optional real-time analyzer (RTA) and the Premium PPM package with moving-coil instruments. Users can move freely scalable instruments to any position on the graphical surface, allowing them to personalize the entire screen area. Views, scaling and metering standards are separately definable for each signal source. In addition, the convenient on-screen help function makes setting up the unit a breeze. The four audio inputs provided by the two AES3 ports are configurable for mono, stereo or multichannel sources, providing separate instruments for each source. Plus, the GPIO interface for overall control, the Ethernet port and the VGA output for external display units offer further functionality.

rtw.de

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*Optional 19" rack adaptor holds up to three units.

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contact: sales@inovonicsbroadcast.com

NAB SHOW New Products

Cardioid condenser mic | Audio-Technica

A-T2020USB+: Equipped with a USB output, this microphone is designed for digitally capturing music or any acoustic audio source employing users' favorite recording software. The AT2020USB+ offers studio-quality articulation and intelligibility. The mic features a built-in headphone jack with volume control that allows users to directly monitor their microphone signal in real time, and a built-in high-output internal headphone amplifier that delivers superior clarity. The microphone also offers mix control that can blend the microphone's signal with pre-recorded audio. The unit's cardioid pickup pattern delivers off-axis rejection, while its A/D converter, with a 16-bit 44.1/48kHz sampling rate, ensures articulate sound reproduction.

audio-technica.com

Automation control system | Gefen

ToolBox Mini PACS: The Mini Professional Automation Control System (Mini PACS) is used to control audio and video devices using IP over a network. It allows control of one RS-232 serial-controlled device, three IR-controlled devices, and two relay contacts. The Web user interface allows IR and two-way RS-232 commands to be sent by the Mini PACS to the connected devices to execute the desired functions. The IR and RS-232 ports can be configured, allowing the Mini PACS to be compatible with most audio and video devices. It can learn, store, and manage IR commands from other manufacturers' remotes. Two normally open relays allow control of screens, blinds or draperies.

gefen.com

Creative sharing hub | Adobe Systems

Creative Cloud: Adobe Creative Cloud provides tools and services for creative people worldwide. A subscription-based offering, Creative Cloud is a hub for making, sharing and delivering creative work and it is centered around the release of Adobe Creative Suite 6 software, packed with innovation across its industry-defining design, Web, video and digital imaging tools. Creative Cloud membership includes: access to download and install all CS6 applications, new HTML5 desktop products and deep integration with Adobe Touch Apps; easy storage and sharing of content across desktop, mobile devices and the cloud; integrated website publishing and hosting; and ongoing innovation with the most up-to-date products and services.

adobe.com

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NAB SHOW New Products

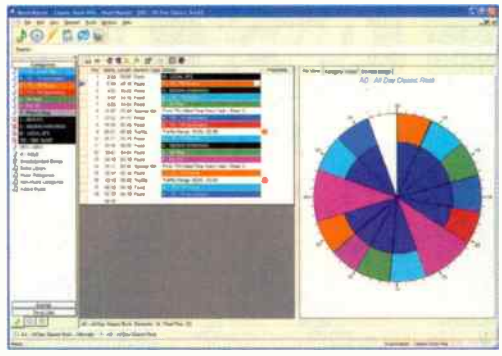
Reference clock | Barix

Real-Time Clock (RTC): This product-agnostic, self-sustaining reference clock plugs into any device with an RS-232 serial port. The Real-Time Clock (RTC) maintains time for year, even when unpowered. This allows the RTC to provide time information immediately after a device startup, independent of a network-based time reference. The product was designed to address the issue of failed network time connections after a power outage. Having the stand-alone time reference allows devices with time events to stay in their schedules until the time reference is restored. Examples include syndicated programs with local network IDs, jingles, ads and promos that can still be triggered on schedule.

barix.com

Scheduling software | MusicMaster

Version 5: Version 5 is 100 percent Windows-user friendly. Data can be shared between MusicMaster and other applications such as Microsoft Word, Excel, PowerPoint and Outlook,



using intuitive copy and paste. You can even import all kinds of data from e-mails, websites and more. Mac users also schedule withMusicMaster, utilizing programs such as Parallels or VMWare Fusion. Multitask with as many different windows within the program as required. Edit music schedules, open the library editor, open a few clocks, open up the Rule Tree, run a history analysis, and leave all these things open going from one to the other. Open them in individual windows to drag-and-drop elements. Create a special program just by dragging songs from the library into the schedule. Share a database on a network and several people can work in the system at the same time.

mmwin.com

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NABSHOW New Products

Video mixers | Roland Systems Group

V-4EX: The V-4EX incorporates HDMI inputs/outputs, USB streaming, HDCP support, built-in touch multi-viewer and audio embedding. The user interface features dial controls for effects on each bus and master output dial. The innovative design incorporates a video switcher, audio embedding, preview monitor and streaming-ready USB output in a single unit. Inputs one to three feature composite (BNC) or HDMI while input four accepts HDMI, RGB/component or S-video. The output features scaled-up HDMI, RGB/component, or SD composite with an additional HDMI output for external preview monitor. The Roland V-4EX features a stereo RCA audio input allowing you to embed audio into the HDMI outputs and USB stream for Web streaming and recording applications. As a USB video/audio class device, seamlessly connect to a computer running a live streaming service.

rolandsystemsgroup.com

USB interfaces | Tascam

US-322 and US-366: These interfaces combine on-board digital mixers (DSP mixer) and on-board digital effects (DSP effects) along with advances on the US-122mkII and US-144mkII interfaces. The US-322 and US-366 sport similar aluminum casings plus new improved HDDA (High Definition Discrete Architecture) mic pres. These mic pres offer a wider frequency response (10Hz to 68kHz), high S/N ratio (98dB), low EIN (-120dBu) and low THD+N (0.0045 percent). The US-366 features 24-bit/192kHz recording. The 2-in/2-out US-322 features one mic XLR/line-guitar TRS input, one mic XLR/line TRS input, two line TRS and two line RCA outputs. The 6-in/4-out or 4-in/6-out US-366 adds two line RCA inputs and one digital RCA/optical input/output. One click of the top-loaded Mixer Panel button will access Tascam's new mixing console screen and on-board insert/send effects. The digital mixer offers two operational modes: multi-track mode and stereo-mix mode.

tascam.com

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NABSHOW New Products

ScriptEasty enhancement | WorldCast Systems

Audemat MasterView Web: ScriptEasy lies at the heart of all Audemat's remote control devices. The intuitive interface consists of the ScriptEasy Designer, which supports easy development and the MasterView module, which allows real time status display and management. Now, with MasterView Web, the user can access the Masterview application via any Internet-enabled device to see at a glance the status and performance of a network. This information is essential for maintenance and management of the remote site as it enables the user to carry out periodic checks, respond to alarm notifications, remotely diagnose faults and trigger any necessary changes. MasterView Web allows broadcasters to gain a unique, comprehensive and integrated view of the entire broadcast chain wherever they may be and at whatever time they wish.

audemat.com

DSP-based radio receiver | DaySequerra

M4FM-HD: The M4FM-HD will stay locked to an HD Radio stream (HD1 and multicast) during power or data interruptions. The 700MHz ARM microcontroller and DSP with on-board flash memory can be updated remotely. The bright OLED displays RBDS and HD Radio PAD, audio level, digital audio quality and carrier quality indications. The receiver can be updated in the field to add TimeLock to maintain perfect time-alignment of HD Radio MPS analog and HD-1 audio and FM Translator+ composite output, variable IF bandwidth and ContentStream. The unit can be factory-upgraded with a DVI USB Port so unit status and all Web server fields can be viewer via an attached LCD monitor and keyboard.

daysequerra.com

Quad 1x6 1/5/10MHz distribution amp | ESE

ES-210: The ES-210 provides four independent 1x6 frequency DAs in a single rack-mount enclosure. Each distribution amplifier has loop-thru inputs and six isolated outputs, which are all accessible via BNC connectors. The ES-210 utilizes screwdriver-adjustable gain controls that are located on the front panel. The gain controls provide an overall signal level adjustment of -1.5 to +3.4dB.

ese-web.com

Solid-state transmitters | Elenos

Indium Series: The Indium Series combines high system efficiency with planar technology, which views a circuit in its two-dimensional state, and uses photographic processing concepts to achieve a series of exposures on a substrate. As used in the entire RF section, this process reduces the parts count, weight, cost, and greatly improves reliability. Additional features of the Indium Series include design suggestions from engineers in the field. The conservative rating of all components extends the life of the transmitter, meaning the transmitter will operate in a much hotter environment. Design steps have also been taken to reduce the impact of high humidity conditions. The ETG2000.20 is a 2kW transmitter with integral built-in exciter. RF Power can be adjusted from 200 to 2kW. The transmitter occupies 2RU. The ETG5000.50 is a 5kW transmitter with built-in integral exciter. RF Power can be adjusted from 300 to 5kW. This model occupies 4RU and does not externally couple two amplifiers to achieve the total output.

elenos.com

FIND THE MIC WINNER
JANUARY ISSUE

Congratulations to

Greg Manfroi

WUIS-FM

Springfield, IL

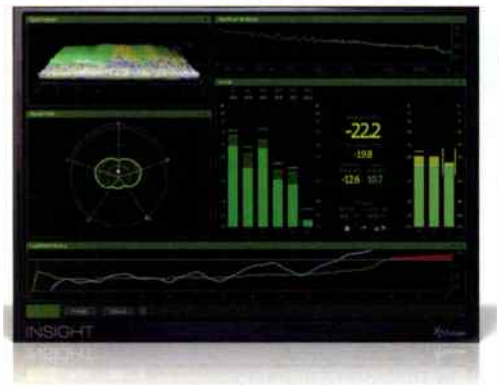
He has won a pair of Hosa Technology HDC-800 headphones

www.hosatech.com

The mic was on the counter behind the host mic and left of the console.

The winner is drawn from the correct entries for the issue two months prior. No purchase necessary. For complete rules, go to RadioMagOnline.com.

NABSHOW New Products



Metering suite | iZotope

Insight: Fully customizable and scalable, Insight allows audio engineers to visually monitor all relevant information from a mix in a convenient floating window, empowering users to look deeper into their audio with intelligent analysis tools and real-time monitoring capabilities. Insight helps ensure adherence to current broadcast standards using the most advanced metering technology available today, with meters for immediate loudness calculation and true peak detection, loudness calculation over time, and faster than real-time offline loudness calculation. Advanced visualization and spatialization displays further aid in detecting problems that the ears cannot perceive, like surround scope and 3D spectrogram. Also included are convenient user presets, designed for an array of engineering applications, for quick and easy access to common metering and loudness configurations. Alternatively, users can define new presets with their own preferred customizations, giving Insight unmatched flexibility in the metering space.

izotope.com

Digital automatic microphone mixers | AKG

DMM6, DMM12: With an intuitive user interface, numerous DSP functions and high signal to noise ratio (S/N), the DMM series provides high-quality automatic mixing technology. DMM12 offers 12 inputs, while easily adjusting the mic to line level. Its four line outputs (2x stereo) are individually assignable for each input. The stereo record outputs are individually assignable, while the headphone out port allows users to listen to each input and output individually. DMM6 offers six inputs and two line outputs at 1x stereo. When in use, all inputs are active, but attenuated to a level that equals the level of one active microphone. If two or more inputs receive relevant input signals, their amplification is increased to a level, which allows overall output to equal one active microphone, resulting in an absolute feedback-stable system.

akg.com

Traffic service | Inrix

Digital Media Suite: The Inrix Digital Media Suite provides reporters with a set of easy-to-use applications and traffic information content with real-time insight into traffic conditions on all major highways and local roads. Alert audiences to the day's current and expected traffic hotspots and expected travel times for key routes. The Inrix Digital Media Suite consists of a radio and a TV application, offering journalists drag-and-drop traffic report creation and editing tools. The apps provide journalists with an intuitive Web-based interface with a comprehensive picture of local conditions including traffic speeds and travel times, detailed real-time traffic maps, alerts to delays caused by accidents and other incidents as well as real-time eyewitness reports from the station's Twitter and Facebook community. Inrix TV and Inrix Radio can be activated immediately and scaled to connect with other devices, production facilities or desired coverage areas.

inrix.com

Transmitter | Ecreso

Helios FM 350W: The first FM transmitters based on 6th generation MOSFETs, the new medium-power FM range is robust and delivers efficiency of up to 74 percent. Top signal quality and performance are achieved thanks to the FM band direct-to-frequency digital modulator, which is at the heart of this product line. The manufacturing quality and the simplicity of use make this a powerful transmitter to broadcast analog FM programs from 100W up to 2kW. Helios FM 350W is fully protected against overheating, VSWR and lightning. Features include full RDS encoding and automated audio backup. Fully featured for local maintenance and configuration, it also allows extensive remote control by Web server, SNMP, RS232 or GPIOs. The 350W FM transmitter is available either as a separate exciter and amplifier or as a single integrated 3RU unit.

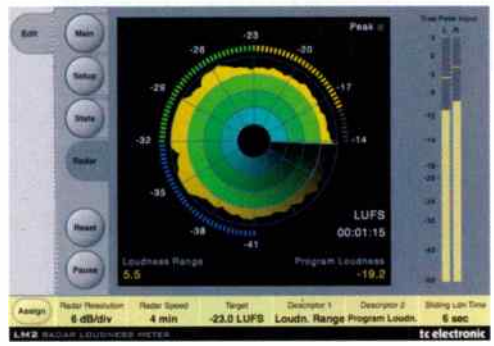
ecreso.com

LED-based medium intensity red beacon | Dialight

Vigilant L-864: The first product of its kind incorporating both red and IR LEDs in a single unit, Vigilant L-864 has been FAA certified to 150/5345-43F. The IR integration ensures better visibility for aircraft pilots using Night Vision Goggles and Aviator's Night Vision Imaging Systems. NVGs and ANVIS typically employ Class A, B and C filters that can reduce visibility of LED light sources. The Vigilant IR beacon incorporates night-vision-friendly IR LEDs and red LEDs in the same unit, making a small and lightweight flash head. This smaller footprint significantly reduces wind load.

dialight.com

NABSHOW New Products



Plug-in | TC Electronic

LM2 Radar Loudness Meter: This LM2 plug-in features TC's Radar Display that provides a quick, yet detailed overview of the loudness landscape of any stereo audio signal. The main radar view shows loudness history, while the outer ring displays momentary short-term loudness. Finally, True-peak Levels are shown in real-time on the right side of the user interface, completing the overview. There are two versatile descriptors that can be set to reflect a variety of parameters like Loudness Range (LRA) and Program Loudness. Each revolution of the radar can be set from 1 minute to 24 hours, which means that LM2 will log loudness data for up to 24 hours continuously.

tcelectronic.com

Audio codec | Harris

Intraplex IP Link 200: The new IP Link 200 adds a second bidirectional stereo input for multi-channel capability and an intelligent front panel user interface offering simple steps to change audio settings and establish IP addresses for network transport. This gives engineers and technicians the freedom to use the IP Link 200 for multiple purposes, from remote broadcast contribution to studio-to-studio or studio-to-transmitter links. The codec otherwise offers entirely analogous audio and streaming capabilities to its predecessor, including support for multiple audio formats and its unique multicoding ability. This feature enables simultaneous delivery of audio in many formats for efficiency in streaming bandwidth.

broadcast.harris.com

Desktop video production | NewTek

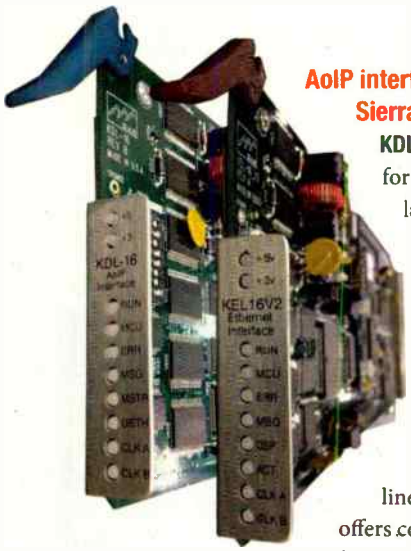
TriCaster 40: TriCaster 40 creates a new entry point for broadcasters and producers who need full-resolution, HD, multi-camera live production and streaming capabilities. TriCaster 40 is a turnkey, desktop video production studio that makes it possible for virtually anyone to create live television for delivery to broadcast, Web and projectors. TriCaster 40 simplifies live multi-camera video production and streaming by eliminating complicated setup and cabling between production components, while integrating video switching, graphics, titles, effects, media playback, virtual sets, keying, recording and streaming in one compact, professional solution.

newtek.com

On-air telephone system | Studer

CMS Lite: CMS Lite serves from a single studio up to multiple studio installations and integrates with Studer's range of OnAir consoles. It allows the installation of a flexible and scalable phone system. CMS Lite uses off-the-shelf standard IT components, saving cost, requiring less installation labor, less cabling and providing a high return on investment. It includes DJ Self-op, switchboard operator and producer modes, waiting rooms and database support.

studer.ch



AoIP interface cards | Sierra Automated Systems

KDL-16, KEL-16: These AoIP interfaces for the 32KD marry the stability and low latency of the synchronous TDM network with LAN-based synchronous AoIP (KDL-16) and WAN-based asynchronous AoIP (KEL-16). Each interface provides 32 channels of AoIP in and out of the 32KD network. The synchronous KDL utilizes the IEEE 802.1 AVB (Audio Video Bridging) standard, which provides linear AoIP using managed switches and offers compatibility with other AVB devices. The KDL enables an interface to computer-based editing and automation/delivery systems using a software driver and standard NIC, eliminating the sound card. The KEL module provides AAC and G.711 codecs along with high quality sample rate conversion to allow WAN-based system-to-system (city-to-city) connections. The KEL also serves as the 32KD interface for the SAS ICM-32 IP intercom system, which provides intercom control and communications between studios and cities. SAS also plans to further develop interfaces to third-party codecs that conform to the EBU N/ACIP standard.

sasaudio.com

Telephone talkshow system | AVT Audio Video Technologies

Magic THipPro: This management and control system is intended for use by phone-in shows or other programming where multiple external phone contributions form a part and is scalable. It can be configured to operate with POTS, ISDN or as a VoIP device and as standard provides a powerful digital echo canceling system, automatic gain control (AGC) and an expander for each of the 16 circuits. The system will be able to store its own address book so contributors can be redialed at the touch of a button. It will recognize numbers and permits data about callers to be attributed enabling lists of good quality callers to be created as well as to blacklist others. The magic THipPro also provides call forwarding and can share its resources between up to six individual studios.

avt-nbg.de

UPGRADES AND UPDATES

Ecreso Worldcast Systems transmitters have been awarded FCC certification for LPFM use in the United States. (ecreso.com) ■

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Digilink-HD (DHD) is designed from the ground up for today's fast paced, distributed content, single station or multi-site Group. It empowers local and remote talent to collaborate to deliver exciting content, build your audience share, and increase sales. DHD has the tools to enable you to work faster, work smarter, and do more.

For On Air, DHD supports live on air, live assist, hard disk automation, satellite automation, and Games automation. DHD supports multiple sound cards for interface to a console and live crossfading. DHD supports any kind of programming and any size market or multi-site group.

To manage audio content, audio files can be shared across the station or across the planet. While DHD fully supports both 3rd party traffic and music schedulers, it also features a powerful internal Traffic scheduler and sophisticated Music scheduler.

To create live sounding automation and facilitate flexible use of talent, DHD features a powerful segue editor, voice track recorder-editor, and remote voice tracking over a VPN (virtual private network). The voice track recorder-editor supports complete control plus the ability to assign a music bed under the voice track with ducking.

While Digilink-HD is used in all on air studios, a software utility named 'DHD-Tools' is used in all support studios: traffic, production, library management, music scheduling, local voice tracking, remote voice tracking, and more. The program is user configured to match the exact need of the specific studio and talent working it. DHD-Tools can be mapped to up to ten network studios (local or remote) to manage libraries, schedule, do production, and much more.

In today's competitive Radio market, product cost and the cost of support are always a consideration. So, Digilink-HD is available (1) at a per month cost as a return at any time 'Solutions' program or (2) as a traditional purchase with a year of support and optional out-of-warranty support programs.

In the 'Solutions Program', the first On Air studio at a station is $200 per month and additional on-site On Air studios are $100 per month. A 'DHD-Tools' program is provided free of charge for each on air studio. The Solutions program includes software, Bridge USB docking station for each On Air studio with dual stereo sound cards and a 16 stereo input routing switcher, free telephone support, free training at the factory studios, and free software Updates and Upgrades. Just add PCs, network, and server (optional). Go to our website or call the factory to get more information on how to configure your station or group.

An example traditional purchase for a 4 On Air / 4 Auxiliary studio system starts at $49,000 list price ($30,000 introductory sale price). It comes complete with 4 On Air PCs with Digilink-HD and 4 Bridges, 4 Production PCs with DHD-Tools, and one year of support.

powerful and yet AFFORDABLE by all !

For less than the cost of most Support programs you can have Digilink~HD.

As an example...

*** 4 On Air studio Cluster complete...**

only $500 per month

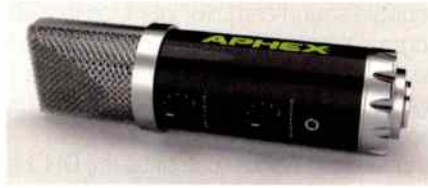
* includes:

Digilink~HD software for 4 on air studios, 4 Bridge docking stations (each has dual stereo sound cards and a 16 stereo input routing switcher), DHD~Tools software for 4 auxiliary studios (Traffic, Production, Voice tracking, more), free telephone customer support, free training at the factory studios, free software Updates and Upgrades... just add PCs, network, and optional Server.

... affordable by ALL

NABSHOW New Products

Cardioid condenser USB mic | Aphex



Microphone X: This high-quality cardioid condenser USB microphone comes with integrated analog processing including optical compression and Aphex's Aural Exciter and Big Bottom, and HeadPod 4 technology. The Microphone X is configured to put all of the key analog processing used for recording the voice before the conversion to digital, thereby ensuring the best possible recording quality. All this processing power is controllable, with input trim, headphone output level and individual controls for the Aural Exciter and Big Bottom levels. Each of the processors has on/off control. Users record an optimized signal right into a DAW via USB.

aphex.com

Power sensor | Bird Technologies Group

7020 Series: This sensor is an economical, plug-and-play solution for power measurement needs. The 7020 determines and reports forward and reflected true average power and VSWR over a wide frequency range of 350MHz to 4GHz. It also never requires field calibration, only requires factory calibration once per year and is traceable to National Institute of Standards and Technology (NIST).

bird-technologies.com

Updated mixer | Logitek

Mosaic: The new Mosaic features OLED screens throughout. Screens have also been added to the Softkey module along with Selector functions. Overall functionality was also updated, with easier access to multicolor on/off and selection buttons and better illumination of controls. Frame sizes are available for consoles ranging from 4 to 24 faders; Mosaic consoles now feature attractive, easily installed tabletop enclosures that can be placed anywhere or moved out of the way when not needed. Power usage was also addressed in the re-design, with the new console consuming about a third less power than the previous model. Two styles of meter bridges may be used along with Logitek's new vMix+ utility.

logitekaudio.com

UPS | Staco Energy Products

FL160 250: An offering for 160-250kVA applications, these online, double-conversion units have efficiencies of up to 98 percent, while delivering maximum availability and flexibility. Up to eight FirstLine P units can run in parallel, providing uptime for mission critical applications without the need for additional hardware. True on-line, double-conversion technology is achieved through IGBT and digital signal processor (DSP) control, enabling delivery of a high input power factor of 0.99, and a low input current distortion of less than or equal to three percent. These new additions were developed in direct response to customer requests for a higher kVA UPS to the 480Vac product family.

stacoenergy.com

N+1 switching matrix | Myat

SS201XWA2-1, SS301XWA2-1: Myat coaxial transfer switches offer a high-quality motor and an engineered drive movement to provide consistent operation. Electrical performance provides high isolation and low VSWR across all the broadcast frequency bands. Precision fit silver-plated and beryllium copper current paths ensure maximum power handling capacity, low loss and long service life. The switch drive can be configured for either 120 or 240Vac and the control can be either 12 or 24Vdc. In the case of power loss, the switch will remain in position when power is restored. Manual override can be performed when ac power is disconnected.

myat.com

Mobile phone | AETA Audio Systems

ScoopFone HD: The ScoopFone HD is a professional mobile phone that integrates 3.1kHz 2G telephone calls into the broadcast chain and offers significant audio quality increase to 7kHz/HD Voice in 3G/UMTS mobile networks. HD Voice delivers higher quality voice transmissions by extending the frequency of range of traditional or narrowband voice calls (300Hz to 3400Hz) out to wideband audio ranges (50Hz to 7kHz). The 7kHz wideband sound quality allows the full signature character of the reporter's voice to be heard. Three ScoopFone HD units combined in a studio or a remote vehicle rack allow high broadcasting quality at the receiving end and complete the ScoopFone HD lineup. Its broadcast specification input and output interfaces with full RF shielding of all audio circuits ensure interference free audio. The digital nature of the system provides complete separation of the send and return circuits—each with its own dedicated audio connection. Remote control is available through an Ethernet interface.

aeta-audio.com

Saturday April 6			Room
SBE Ennes Workshop: Alternate Broadcast Delivery	8 a.m. - 10:10 a.m.	Streaming Media Tutorial	S225/226
	9 a.m. - 9:10 a.m.	SBE Ennes Workshop Opening Remarks	
	10:10 a.m. - 10:25 a.m.	Media Consumption Patterns: Myths and Realities	
	10:25 a.m. - 11:10 a.m.	Audio Video Bridging	
	11:10 a.m. - 11:40 a.m.	Mobile Devices Location and Authentication Technologies: What They are, and How They Could Benefit Broadcasting	
	12:45 pm. - 1:30 p.m.	Making Integrated Production Systems (IPS) Work	
	1:30 p.m. - 1:55 p.m.	Cable... Moving to IP	
	1:55 p.m. - 2:15 p.m.	Case Study of an Internet Video Delivery Solution	
	2:15 p.m. - 2:35 p.m.	Meet Granville Klink	
	2:25 p.m. - 3 p.m.	Fragmentation: The Challenge New Media Faces Reaching Consumers	
	3 p.m. - 3:30 p.m.	AES X192	
	3:30 p.m. - 4 p.m.	Multicasting in a Unicast World	
	4 p.m. - 4:25 p.m.	Providing an OTT Service: How Skitter Works	
	4:25 p.m. - 5 p.m.	MPEG-Dash Tutorial	
Sunday April 7			**Room**
	9 a.m. - 9:30 a.m.	BEC Opening Keynote	S225/226
Advanced Technologies for Radio	9:30 .m. - 10 a.m.	Deploying Artist Experience (Album Art) via HD Radio	S227
	10 a.m. - 10:30 a.m.	Standards for Hybrid Radio	
	10:30 a.m. - 11 a.m.	Program Associated Data Implementation at Wisconsin Public Radio	
	11 a.m. - 11:30 a.m.	In-Car Hybrid Radio	
IP for Radio	1 p.m. - 1:30 p.m.	Audio Reliability over the Public InternetDesigning Robust IP—Streaming for Outside Broadcasts, STL, and Program Distribution	S227
	1:30 p.m. - 2 p.m.	Put Your Audio on the IP Path: Integrating Audio over IP into your Current or New Radio Facility	
	2 p.m. - 2:30 p.m.	AES X192 - an emerging standard for high-performance streaming audio-over-IP interoperability	
	2:30 p.m. - 3 p.m.	Audio Networking Interoperability: Advantages, Challenges & Standards	
	3 p.m. - 3:30 p.m.	Advances in AoIP Connectivity for Extending the Radio Operation Beyond the Studio	
	3:30 p.m. - 4 p.m.	The Open Control Architecture	
	4 p.m. - 4:30 p.m.	IP Audio in the Real-World	
	4:30 p.m. - 5 p.m.	Taking the Sting Out of the Evolving Digital Audio Networks	
Monday April 8			**Room**
	9 a.m. - 10:15 a.m.	Opening Keynote and State of the Industry Address	LVH Paradise
	1 p.m. - 2:15p.m.	Top Radio Technologies You'll See on the Floor	N234/236
Radio Receiver Technologies	1 p.m. - 1:30 p.m.	Three In-Car Trends Broadcasters Need to Know About	S228
	1:30 p.m. - 2 p.m.	RDS Station Workshop	
	2 p.m. - 2:30 p.m.	Adaptive Impedance Matching (AIM) for Electrically Small Radio Receiver Antennas	
	2:30 p.m. - 3 p.m.	Advances in HD Radio: Improving Coverage and Reception Quality	
AM Revitalization	3 p.m. - 4 p.m.	AM Band Revitalization Featuring FCC Commissioner Ajit V. Pai	N231/233
	4 p.m. - 4:30 p.m.	Field Testing of All-Digital AM IBOC	
	4:30 p.m. - 5 p.m.	HD Radio Update	
	3:10 p.m. - 3:45 p.m.	Audio Distribution in an IP-based Multiplatform Broadcast Plant	S227
	3:45 p.m. - 4:20 p.m.	IP Control in the Broadcast Facility	S227

SBE Membership Meeting | Tuesday 5:30 - 6:30 p.m. S227

Amateur Radio Operator's Reception | Wednesday 6 -8 p.m. LV Hotel

Tuesday April 9			Room
Radio Engineer's Forum: Part I	9 a.m. - 9:30 a.m.	Maximizing STL Robustness Through Intelligent Interplay of RF and IP	S228
	9:30 .m. - 10 a.m.	Broadcasting in New York City -The Reestablishment of Broadcasting at the World Trade Center in a Post 9/11 World	
	10 a.m. - 10:30 a.m.	A Free Online VHF/UHF Propagation Tool for Technical and Non-technical Users	
	10:30 a.m. - 11 a.m.	Enhanced Emergency Alerting Delivery Mechanism over HD Radio Signals	
	11 a.m. - 11:30 a.m.	Proper Bonding and Grounding in a Broadcast Environment	
	11:30 a.m. - Noon	Using Public Domain and Open Source Software to Derive Base Drive Voltages for AM Method of Moments Models	
	10:30 a.m. - 11:45 a.m.	Radio Regulatory Revue	N235/237
	10:30 a.m. - Noon	Technology to Enhance Radio Salespeople's Productivity	N234/236
Radio Engineer's Forum: Part II	1 p.m. - 1:30 p.m.	Part 101 Licensed Microwave STL Solutions	S228
	1:30 p.m. - 2 p.m.	Digital Advancements in AM Directional Antenna Monitoring	
	2 p.m. - 2:30 p.m.	Integrated Content Presentation at the Canadian Broadcasting Corporation	
	2:30 p.m. - 3 p.m.	The Way of Improving T-DMB/DAB Reception Performance by Obtaining Diversity Gain in Legacy Single Frequency Networks	
	3 p.m. - 3:30 p.m.	Structural Evaluation of Pipe Leg Tower Structures, Engineering and Execution of Controlled Demolition of Guyed Structures	
	3:30 p.m.- 4 p.m.	Design Parameters for FM Signal Repeaters Based on Listener Testing	
	4 p.m. - 4:30 p.m.	New Findings on FM L+R/L-R Multipath Control	
	4:30 p.m. - 5 p.m.	SNMP and Me: Real World Experiences of Using an Ancient Protocol in a Modern Broadcast Facility	
Wednesday April 10			**Room**
Technical Regulatory Matters for Broadcasters	9 a.m. - 9:30 a.m.	But Can You Actually See the Captions? The Practicalities of Putting Captions on IP-delivered Content	S228
	9:30 a.m. - 10 a.m.	Two Steps Forward: Building a Partnership to Improve Public Warnings	
	10 a.m. - 10:30 a.m.	How the FCC's Repacking of the TV Band Will Affect Your Station	
	10:30 a.m. - 11 a.m.	EAS, Superstorm Sandy, and Accessible Emergency Warnings – A Discussion of Broadcasters' Role as "First Informers"	
	9 a.m. - Noon	RF Boot Camp: Understanding Radio & Television Transmission	S219
	12:30 p.m. - 2 p.m.	Technology Luncheon	LVH Paradise
	2 p.m. - 5 p.m.	RF Boot Camp: Understanding Radio & Television Transmission	S219
Thursday April 11			**Room**
	9 a.m. - 9:30 a.m.	When Will Broadcast Plants Go 100% IP Routing?	S227
Planning for Safety	9 a.m. - 9:30 a.m.	LED Obstruction Lighting Systems Reduce Energy and Maintenance Costs	S228
	9:30 a.m. - 10 a.m.	RF Radiation Measurement Improvements	
	10 a.m. - 10:30 a.m.	Tower Contractors, Qualifications, Safety Checklists and Guidelines - What to Look For...and Why?	
	10:30 a.m. - 11 a.m.	Disaster Planning and Insurance: How to Survive a Devastating Fire	
	11 a.m. - 11:30 a.m.	Practical Application of the ANSI/IEEE RF Safety Program Standards to Radio/TV Broadcast Antenna Sites	
	Noon - 12:30 p.m.	IEEE 802.1 AVN Ethernet Protocols and their Applicability to Broadcast Systems	S227

2013 Streaming Audio UPDATE

By Doug Irwin, CPBE DRB AMD

So it's 2013—where's my flying car? Sometimes it can be useful (and amusing) to go back and look at articles about soon-to-be-used technology, and how they are— in fact—used today. This article is about state-of-the-state of audio streaming technology: how it is generated and received. Many of us work for companies that put a lot of effort into their streaming media. I believe that this effort is important, but I also want to be objective about our industry's achievements with streaming media over the last 10 or so years.

Increasing popularity of streaming. There is no doubt that use of streaming audio continues seeing growth. You can spin the statistical results in more ways than one though. For example, if you look at the recently published U.K. audience results from RAJAR, you will see that online listening (including via apps on mobile phones) has grown 43 percent year over year. That's an impressive figure, to be sure. On the other hand, online listening in the U.K. (again, including mobile phone apps) now represents 4.9 percent of all listening there. That doesn't sound quite as impressive—though assuming the growth rate remains constant, next year we would expect to see it to reach 7 percent, and the year after, 10 percent. Whether or not this increase will come at the expense of over-the-air (OTA) listening remains to be seen.

Likewise, if you look at online measurement results provided by Triton Digital, and compare December 2012 results with those of December 2011, you'll also see dramatic changes in online listening in the United States (below).

Granted, these are only the top five, and it's simply a year-over-year comparison; but it is interesting that not all the top five show year-over-year increases. To make it more of an apples vs. apples comparison with the RAJAR results, I compared the sum total (top five) average active sessions year over year, and I come up with a 43 percent increase, just like that of the U.K. The conclusion that I'll draw from this is that we can expect more increases when the same results are published a year from now.

With the ever-increasing popularity of online listening one could reasonably expect that more and more revenue for radio is being generated

Triton Ranker (top 5) Dec 2011			Triton Ranker (top 5) Dec 2012			Year-to-year change (%) avg. active sessions
	Avg active sessions	*Session stats*		*Avg active sessions*	*Session Stats*	
Pandora	1,143,060	455,340,172	Pandora	1,757,310	805,268,175	53.7
iHeart Radio	178,082	76,717,405	iHeart Radio	266,937	109,514,313	49.8
CBS	90,124	28,598,559	CBS	62,958	18,354,059	-30.0
Slacker	67,910	22,103,942	Cumulus	60,433	16,620,531	-4.1
Cumulus	63,068	13,993,846	Slacker	59,808	29,098,688	-11.9

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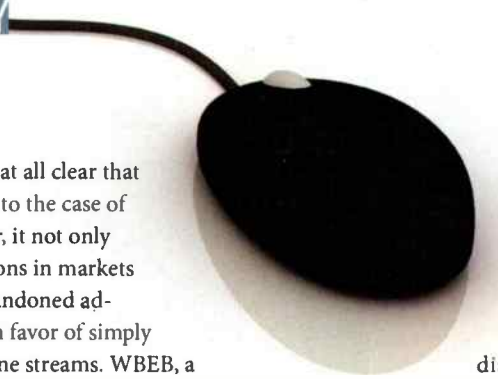

by stream insertion; however, it isn't at all clear that is completely true. I only need point to the case of Saga Communications. Last summer, it not only stopped streaming audio for its stations in markets outside of the top 100, but it also abandoned ad-insertion on its remaining streams in favor of simply simulcasting its OTA audio and online streams. WBEB, a perennial powerhouse FM in Philadelphia, ended its streaming altogether in 2010. KCMS in Seattle has (at least for the time being) given up ad-insertion; I wrote about the methodology previously in the September 2012 issue of *Radio* magazine.

Still, these stations seem to be exceptions to the rule: many stations are streaming, and many of those are employing ad-insertion.

Trying to simplify ad-insertion. In reading articles from last year about why ad-insertion is considered problematic by some companies, I noted that many simply said the results sounded bad or clunky. Some companies simply have been unsuccessful at selling spots for ad-insertion and consequently, not a lot of effort goes in to making the online presentation sound good. Their online stream can easily become an afterthought.

There are quite a few companies that are in the business of helping radio stations make money from their online presentations though.

Let's look at StreamOn. It offers a one-box solution that has quite a bit of functionality. It looks very simple, mainly because it's an all-in-one box, accepting audio from a station (or other source) and generating the streams internally: AAC+, Ogg Vorbis, and MP3. The streams that are generated are sent to StreamOn's own servers, and then distributed to the listening public. Each client station gets its own player (or Web interface), and the player displays artist and song info using proprietary software. That metadata comes from the station's automation.

Perhaps the most interesting aspect of this device though is how it works in conjunction with AdsWizz; this gives the station the ability to sell audio pre-roll, video pre-roll, and targeted ads for ad-insertion on the stream. The targeting can be based on time and day of the week, geography (with granularity down to the Zip Code) or requested demographics. AdsWizz Radio allows for both client-side ad-insertion and server-side ad-insertion.

Liquid Compass is another company that works with radio stations to provide streaming and add insertion. Its Pro 2.0 desktop player includes social media integration, interactive track history with song details, artist biographies, concert schedules and lyrics. The Pro 2.0 Mobile player has social media integration; enhanced now playing

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970.461.0730

Liquid Compass LC Pro 2.0

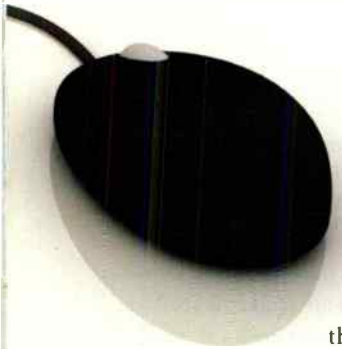
information with interactive history and track details; song ratings, and a place to save favorites; and, it also allows the user to look at program schedules and on-demand schedules by way of RSS feeds. Like StreamOn, Liquid Compass has partnered with AdsWizz to help radio stations generate income from their audio streams.

Abacast Clarity Digital Radio System

Abacast is another well-known provider of streaming and ad-insertion services. It offers the Clarity Digital Radio System for broadcasters. This system will provide for ad-insertion, companion banner ads, pre-roll videos, and rotating display ads. Users can target audiences by day of the week and time of day, the market, the format, or by geo-targeting. And certainly in response to last summer's commotion about ad-insertion, Its Web page reads: "Sound quality is preserved, with no skips, jarring volume changes, or dead air, all of which can cause tune-out."

ABOUT AD INSERTION

Your station isn't obligated to use an outside streaming provider—you can roll your own



streaming and ad-insertion solutions. A good example of the home-grown approach is that used by Clear Channel Media and Entertainment. I previously discussed this in detail in the September 2010 issue of *Radio* magazine. We still use this methodology in New York, and the systems described generate the streams for iHeart Radio.

Stations that use Triton Digital Media to stream now have a new option for ad-insertion called a2x. Once a content provider's stream passes through Triton's platform, the a2x capabilities become available. Triton passes all known information about each listener to participating adservers; this also includes information from a company called eXelate, who collect information that can be used to target audience segments. The adservers receive a request for an ad and may elect to return an ad or pass on the opportunity if the listener information doesn't match the targeting desired. Triton is also able to confirm to the adserver that the impression took place for a specific user.

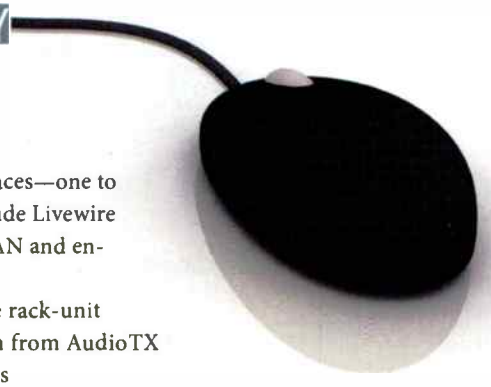
With all the various streams generated inside of a radio station complex today, it could be difficult for the typical radio engineer to spend a lot of time listening to the online presentation. There are many things to do and many other aspects of the radio station (or stations) that need attention, and usually the ones that generate the most revenue get the most of that. Similarly, that can also hold true with respect to the equipment actually used to generate the stream. It was very typical at the beginning to use whatever audio processor happened to be sitting on the shelf to feed the input to a streaming encoder; likewise, the computer used to generate the stream could have easily have been a spare. To get the best sounding streams, and to mitigate the clunkiness (as some in our business call it) it pays to get the right gear for the job. Perhaps it's time at your station to build streamer 2.0. Let's take a look at some of the choices that are out there.

BUILD YOUR OWN STREAM

If you plan on generating your own stream and thereafter forwarding it out to a Content Delivery Network (such as Akamai, Limelight, or CD-Networks to name a few) then are a couple of ways to go about it. First, let's look at single-box solutions.

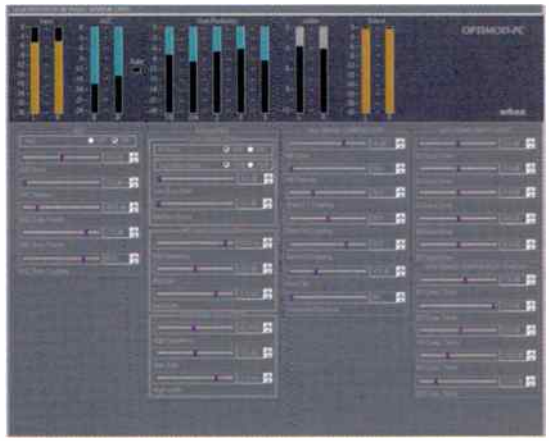
Telos ProStream

Telos makes a single rack-unit device known as ProStream. This device comes with line-level XLR inputs (as well as XLR outputs for listening to the fully-processed unencoded, or encoded, audio) as well as a Livewire input. Its onboard audio processing is from Omnia. ProStream is Linux-based, and encodes streams at bitrates between 16 and 320kb/s for Wowza, ICEcast, Adobe Flash, Shoutcast and Shoutcast v2 servers. Codecs available include MP3, AAC-LC, HE-AAC, and HE-AAC v2. The device is controlled from the front panel, or via its embedded Web



interface. It has two Ethernet interfaces—one to use for the LAN (which would include Livewire and metadata) and the other for WAN and encoder send outputs.

There is at least one other single rack-unit streaming encoder. The Webstream from AudioTX will generate up to six simultaneous streams (different codecs/rate combinations); codecs include MPEG4 AAC, HE-AAC, and MP3 for streams with bitrates between 14 and 320kb/s. The unit will accommodate fixed or dynamic metadata (serial connection via dB9). XLR inputs and outputs; analog or AES. Another interesting aspect of this device is its ability to serve streams; according to their webpage, it will serve up to 5,000 users, dependent of course upon the network connection it has to work with and the bitrate of the streams served. Potentially one Webstream could be located at your studio, and one at the ISP; the studio unit would forward its internally generated streams to the unit at the ISP location, which would subsequently serve all end-users.



Orban Opticodec 1010

You may prefer the CPU-based encoder for your purposes; if so, take a look at Opticodec 1010 from Orban. This codec will generate separate streams such as RTMP for Adobe Flash or Wowza media servers; RTSP/RTP for Apple QuickTime servers or Darwin Streaming servers; RTP Real/Helix Mobile servers, and HTTP/ICY Shoutcast or Icecast2 servers. Codecs include AAC/HE-AACv1/HE-AACv2 and MP3. It supports standards-based, real-time metadata injection. Operating systems supported are Windows XP, Vista, Windows 7, Server 2003, and Server 2008 (32/64-bit). Opticodec will support one multicast stream, but the number of unicast streams is dependent upon the CPU. You'll still need a way to get audio in to the computer though; when using Opticodec 1010 it makes a lot of sense

to use Orban's PC1101 PCI sound card as well. The PC1101 has three on-board DSPs for processing—AGC, EQ, multiband compression, and look-ahead limiting. The PC1101 also has a built-in mixer, with one stereo analog input, two AES3 digital inputs (with SRC), and two WAV inputs, all of which can be mixed, or switched. Additionally PC1101 has two AES outputs, and two WAV outputs.

INTERNET ACCESS IN CARS

I've been reading (or so I thought) about the coming of integrated Internet access in automobiles. However, I see nothing so far in 2013 that indicates any model by any manufacturer with an on-board computer that accesses the Internet. For the last three or four years, the car manufacturers have expected you to use your own smartphone for the Internet access, and to connect to the car infotainment system via bluetooth. For years it's been feasible to put a 3G modem/hotspot in the car to serve up Internet access to riders; of course now it could be 4G as well.

To me it seems no progress has been made on this front. On one hand it seems odd to rely on your smartphone plus Bluetooth just to get radio in the car; on the other hand, if you already have one account with your wireless provider, why bother with yet another for your car?

In the last several years we've seen both evolution and de-evolution with streaming audio. At first, we all did simulcast streams with terrestrial broadcasts; then ad-insertion came in to vogue. As time has marched on, some stations have given up ad-insertion (and some have given up streaming altogether); others have taken on very sophisticated and granular ad-insertion techniques backed-up by sophisticated audience measurements. Whether the mass media of OTA radio, with its ability to reach hundreds of thousands (and even millions) of people with a common message that they're all hopefully interested in (such as what is on the 7 p.m. news tonight) will remain viable, when methods now exist to reach individuals with tailored messages, remains to be seen. It would seem that, due to the nature of advertising (i.e., some ads appealing to common needs, and some, to individual needs) a place for both exists.

RESOURCES

Abacast
abacast.com

Akamai
akamai.com

AudioTX
audiotx.com

CDNetworks
cdnetworks.com

Limelight
limelight.com

Liquid Compass
liquidcompass.net

Orban
orban.com

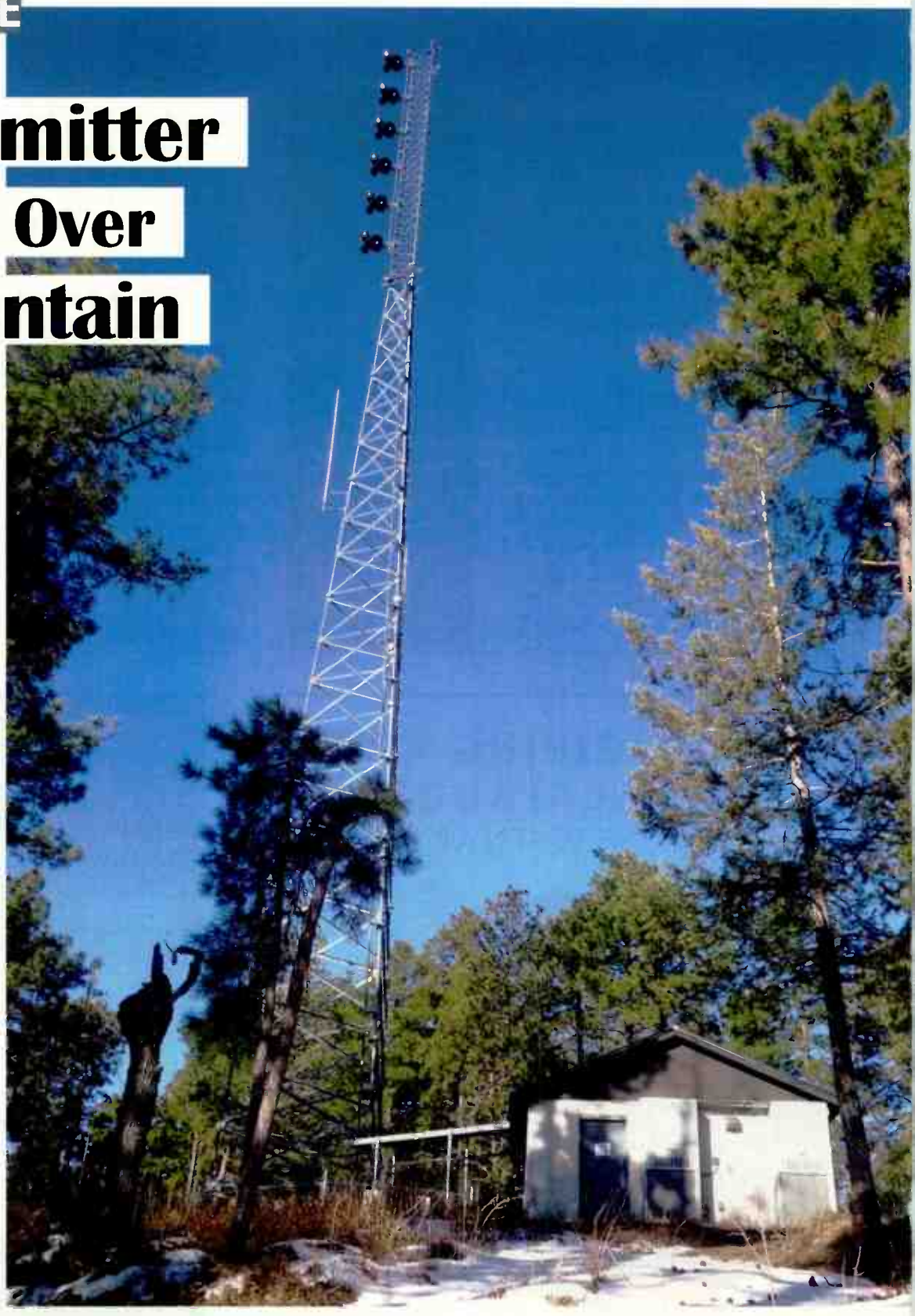
StreamOn
streamon.fm

Telos
telos-systems.com

Triton Digital Media
tritondigital.com

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

The Transmitter Goes Over the Mountain



Engineers work against tight spaces, large legacy equipment and a forest fire

By Richard White

The summit of the Bradshaw Mountains rises more than 8,000 feet above ground level in central Arizona's Sonoran desert. Approximately 66 miles north of the Phoenix city limits, the transmission facility for two Sierra H Broadcasting FM stations is situated near the highest mountain peaks, among the Ponderosa Pines and short-horned lizards.

The location is certainly prime real estate for high-power FM transmission, but not without its challenges when modifying an outdated RF facility.

Klein White Broadcast Engineering is a full-service design and engineering firm that primarily serves the Phoenix area. Sierra H Broadcasting essentially hired us to install a transmitter for KNRJ-FM, the second of two stations to consolidate into the mountaintop facility.

The facility was already home to KAJM-FM, having moved in four years prior. At the time of the KNRJ move-in, KAJM was operating a Nautel NV30 with half of a Harris Platinum Z-16 transmitter in backup mode. The Platinum Z had once operated as the main 16kW transmitter, but took a series of lightning strikes—more than 14 in one night—rendering it nearly useless. It was rebuilt as a double-cabinet 10kW transmitter (single-phase) and put into backup.

OMNIA.11 FM
OMNIA.11 FM.HD
OMNIAAUDIO.COM/11

FEEL IT.

Meanwhile, the previous engineering team installed the Nautel unit—a robust and reliable transmitter, but too enormous for this project on two levels. First, a 30kW transmitter for a 15kW TPO was an unusual choice (IBOC had been considered, but then decided against); second, the large footprint took far too much room in a space-challenged, 22x22-square-foot building.

The big question: How do we move a second transmission system, complete with main and backup transmitters, into a building with almost no additional space?

The first parts of the transmitter are installed.

The answer: A near complete redesign.

SITE EVALUATION

There is no question that a site this remote requires backup transmitters. It takes three hours to reach the facility on a clear day. The winters here bring snow—up to 2.5 feet at the time of writing—and it takes a Snowcat to reach the site. Delivering a completely new system could take days, with devastating effect to a station's bottom line from being off the air.

This left little choice beyond retiring the current transmitters. The Platinum Z was removed, rebuilt and resold as two separate

10kW transmitters. The Nautel removal was a more difficult proposition. The double-wide cabinet, nearly 8' long, was inseparable. We dragged it from the building with a tractor and set it in a pick-up bed for transport down the mountain.

The major requirement for the new transmitter was size versus output power, equally important in both space considerations and the fact that only single-phase electricity is available at the site. This steered us toward solid-state digital transmitters, which would avoid having to add rotary phase converters to make power.

We decided to purchase four Harris Flexiva 20kW transmitters. The Flexivas offered the compact footprint we needed to fit two main and two backup transmitters in a space that traditionally had space for only one transmitter and half a backup.

EQUIPMENT LIST

- Andrew dehydrator
- APC AP7752
- Belkin monitor rackmount w/built in KVM
- Bird 6PME display panel, power sample section
- Broadcast Tools DMS-II, Silence Sentinel Basic
- Burk ArcPlus, Plus-X AC-8, Plus-X ICRU, Plus-X IIU
- Cummins 800A, Cummins/Onan propane genset
- DaySequerra M2A-FM
- Dielectric 3⅛" four-port motorized coaxial switch, dual switch controller
- ERI six-cavity T combiner
- Fostex RM-1
- Harris Flexiva
- Harris Intraplex STL HD T1
- Henry Engineering Powerswitch
- LEA DS30S
- LEA Powervantage surge suppressor
- Liebert GXT2 UPS
- Middle Atlantic PD-815
- Myat, Shivley, Dielectric 3⅛" rigid line and components
- Orban 6300, 8600FM

Though the stations need only 13.5kW from each transmitter to meet licensed power, the 20kW design offers additional headroom for additional services in the future. However, the distance from the studios—approximately 74 miles—means that both stations will operate in FM-only configurations for the foreseeable future.

The choice was made, but it wasn't just plug-and-play. There was much advance work required to get the site in order.

GROUNDING, ELECTRICAL AND HVAC

The fact that the Platinum Z took 14 lightning strikes signified a serious grounding problem. The site is now very well-protected, with bonding rings inside and outside made with four-inch strap, and six chemical grounding rods surrounding the building to mitigate lightning strikes and electrical faults. LEA PowerVantage external surge suppressors provide additional RF system protection.

Most interior electrical work was redone, upgrading from a 400-amp to an 800-amp service. Prior building renters improperly tapped into electrical panels and left wires from previous installations bare and protruding from walls. This asks for trouble in RF environments where non-terminated wires left for dead can resonate RF, producing feedback. They also can attract static electricity and lightning. LEA DS30S inline surge suppressors provide additional interior protection for the new RF systems.

HVAC was itself a project, with modifications to a pair of Bard 6-ton wallmount, single-phase units. Site power is far from stable, and we've encountered interesting problems—notably that the digital controllers on modern AC units often lock up. Quick power interruptions are often the cause, so we stripped the digital controls and installed mechanical relays. When the power stops, the mechanical controls dial in like timed relays and restart the units after 20 seconds.

While an improvement, the overall AC system still lacks the required redundancy, and a third unit will be added in the spring. This unit will automatically turn on if one of the main units goes south to avoid overheating the building.

TRANSMITTER INSTALLATION AND DESIGN

The Flexiva is a single-cabinet design that resembles an equipment rack. The 20kW model is built from two 10kW power blocks, with no external power supply or combining network required. All connectivity is internal. This makes it compact enough to fit four 20kW units in a 22x22-square foot building with other equipment racks, a combiner, dummy loads, air conditioners, service entrances, disconnects, surge suppressors and transfer panels—and room to spare for engineering service.

The high elevation makes transport a challenge, as previously noted. It's nearly impossible to drive a huge transmitter truck up the mountain, and the Flexiva design allowed me to break the transmitter down into components that I could easily transport. This very much simplified the move-in process, as the rack was the largest piece to transport.

The transmitters, each outfitted with Harris FlexStar exciters, were reassembled onsite. We loaded the cabinet set including power supplies and amplifier modules, and reattached the side doors once each transmitter was in place. A used ERI six-cavity U combiner was repurposed and reconfigured into a more space-friendly T arrangement to bring the entire RF system together.

At the same time we replaced an existing Moseley 6000 STL system with a Harris Intraplex STL HD T1 system. We additionally added Orban 8600FM units for on-air processing, and DaySequerra M2A-FM modulation monitors. The Orbans sound exceptionally nice, and we use AAC encoding on the Intraplex for the best possible audio quality and least amount of delay. It has worked very reliably, with only rare minor interruptions.

We plan to install an Intraplex HD Link 950MHz STL system when the weather breaks, and switch between the two units every 30 days or so. The terrain and distance from the studio involves multiple hops for a 950-based system, and will require some path analysis, new microwave dishes and multiple tower crews.

Exterior work on the tower was limited to re-tuning and double-slug tuning the existing six-bay ERI antenna. The previous engineers had the foresight to consider that the antenna would be diplexed down the road, minimizing equipment and labor costs on antenna and tower changes.

The transmitters and equipment racks installed and in-place

FIRE ON THE MOUNTAIN

With space in the transmitter site being at a premium the project was

done in stages. Removing the Platinum-Z and NV30 transmitters and installing the new main Flexiva for KAJM while keeping the station on the air was first. Repositioning equipment racks and installing coaxial transfer switches was next. Retuning the antenna, installing the six-cavity ERI T combiner and the new main Flexiva for KNRJ followed. The last thing to do was bring both the station's new backup transmitters up the mountain for installation.

As luck would have it, a forest fire broke out just as we planned to head up the mountain, cutting off access to the site. Within a day the fire had burnt down 16 utility poles, cutting off electricity to the site. The generator kicked in, and with 3,000 gallons of fuel and a burn rate of roughly 1,000 gallons a week we counted the days.

Ultimately, we lost power when heavy air tankers dropped water and slurry on the mountaintop to cover firefighters on foot who had been cut off trying to maintain containment lines. Our Cummins generator was waterlogged and power was lost, but firefighters saved the site.

It was at this point that we put the FlexStar exciter to the test. I located a hill in town for an emergency facility that kept us legally within out 60dB contour. After filing the FCC paperwork, we installed vertical dipoles shipped overnight from Shively, pulled the exciters from the backup transmitters, dialed in the needed changes and fired them up. The exciters proved stable and allowed us to broadcast at 35W, keeping both stations on the air until we could regain access to the site several days later to fix our generator and re-fire the mains.

SIGHT AND SOUND

The exciter not only helps to produce good sound but also offers a built-in spectrum analyzer to better understand coverage and audio artifacts. Multiple metering points along the transmission line, as well as output from the combiner, offer additional insight into the overall audio picture. It's helpful to evaluate the various samples and paths to gauge if any auxiliary equipment is tainting or coloring the audio.

The Flexiva itself offers several additional monitoring options, including front panel visuals and an IP connection with a richer graphical representation. We also interface with Burk ArcPlus remote controls so I can call in by telephone when necessary. An SNMP interface opens up an entirely different monitoring universe that we have just started to explore.

The transmitters have been stable, with just one glitch related to an air conditioning problem—and the main reason we're adding the third AC unit this spring. The APC setting had inadvertently been turned off in one of the transmitters, and when an AC unit locked up the transmitter didn't fold back power to compensate. Eventually, a piece of transmission line failed, with minor damage to the directional coupler and controller board. The backup was put immediately into service and repairs to the main were quick and easy to perform.

OPERATIONAL EFFICIENCIES

An emerging benefit of the transmitter installation correlates with the monthly operating costs. We initially couldn't tell much difference between the Flexivas and the Nautel, but with two transmitters running for several months everyone is quite pleased with the electrical draw. They don't jump around or spike and keep very consistent output power. This results in stable draw, which results in predictable monthly bills. The lack of fluctuations in power is especially helpful for the in-line surge suppressors. Additionally we have not experienced a single power supply or PA module failure to date.

As of press time we have made it through the rainy autumn season, which brings an assortment of storm-related electrical activity. With winter passing in the rearview mirror, it's time to look forward to getting our HD Link on the air—and hopefully dodging any repeat forest fires this spring and summer.

White is president of Klein White Broadcast Engineering. He can be reached at richard@kleinwhitebroadcast.com.

Shielded Loop Antennas for the AM Band

by Doug Irwin
CPBE DRB AMD

Last month I wrote some about making a notch filter for the AM band. However, before you have any signals to notch out, you must first, of course, have some signal to begin with. Let's talk a little about shielded loop antennas for the AM (or MW) band.

If you have an AM station in your group then it's quite likely that you'll need a clean off-air signal at the studio location. That's not always as easy as it sounds at first; there could be any number reasons that off-air reception is hampered or otherwise less-than-perfect. And even if you don't have an AM station in your group there are plenty of reasons you might need to receive one cleanly off-air: the station you want to receive could be an EAS source, a news or sports source, or maybe even a competitor. You could be relatively far away from them, or you could be in a noisy environment (electrical noise that is) or perhaps there is a strong local AM causing problems with reception of the weaker signal. A shielded-loop antenna may very well be all you need to pull in a good signal.

Likely you already know that the loop antenna is quite directional; it has its maximum reception parallel to the plane of the loop, and nulls that are orthogonal to the loop (that is, rotated 90 degrees). See Figure 1. The advantage to this is that, by changing the bearing of the loop, you can optimize the desired to undesired ratio as seen on its output. In other words, you might maximize the station you want, hoping for a reduction in strength from the station you don't want; or you might null out the station you don't want, while finding the one you do still comes in OK.

When a loop is shielded it means that the turns of the loop itself are inside of a shield—one that is open at some point. See Figure 2. This shielding has the very beneficial effect of rejection of electrostatic fields—often the source of noise getting in to an AM receiver. Since the shield is open, the incident magnetic fields (i.e., the station you want to receive) will still induce voltages in the loop, thus providing a signal for your receiver.

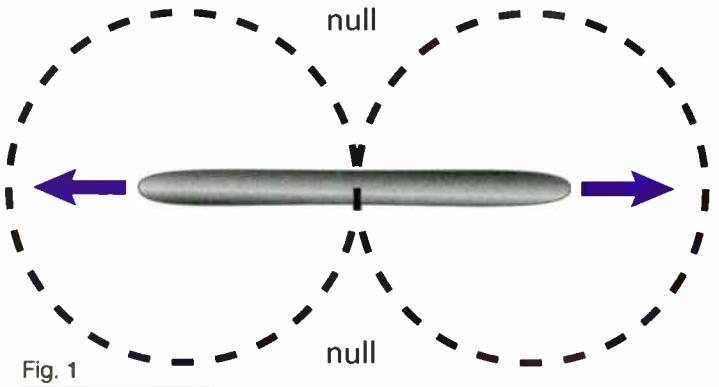


Fig. 1

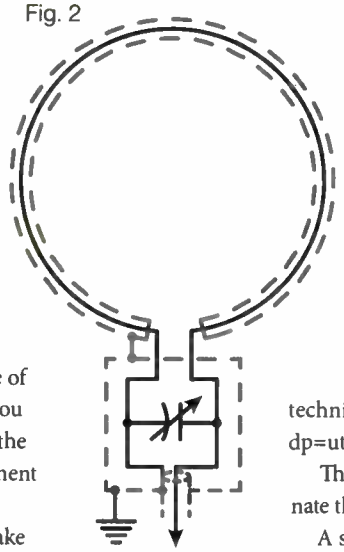


Fig. 2

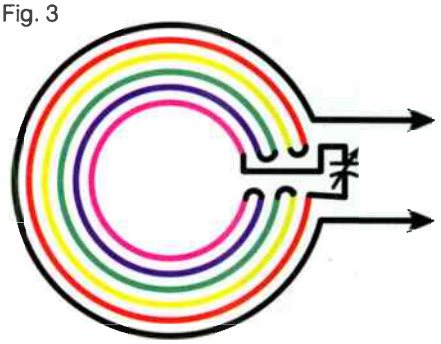


Fig. 3

There are quite a few sources of this type of antenna. For starters, you could roll your own at the very least as an experiment to see if your reception problems are solved. Take a look at this engineer's notebook entry from *Radio* magazine (radiomagonline.com/tutorials_tips/engineers_notebook/radio_sheildedloop_am_antenna)

Years ago my friend John Scherer used to build and sell shielded loop antennas; I mention his because he used to load the loop a little differently. Take a look at Figure 3. John made square loops from copper tubing, with PVC as the center insulator. The windings themselves were made from a ribbon cable. The number of turns of course depended upon where in the AM band the antenna was supposed to resonate. (If you want to hack this design yourself, take a look at this online calculator to figure out how much inductance the loop will have: technick.net/public/code/cp_dpage.php?aiocp_dp=util_inductance_rectangle.

Then find the capacitor that will in turn resonate the loop here: 1728.org/resfreq.htm.

A single-turn was coupled to the main loop magnetically, and the main loop was resonated. That single turn drove a coax output that was meant to drive 50 ohms.

If you want to buy a commercially made product, Belar Electronics makes a shielded loop antenna: belar.com/AM/lp1.htm.

This type of antenna is also popular with ham radio operators and other hobbyists. Take a look at this one from AOR USA: aorusa.com/antennas/la400.html. This one is not meant to be used outside though, so hopefully it could find a safe place inside your radio station.

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

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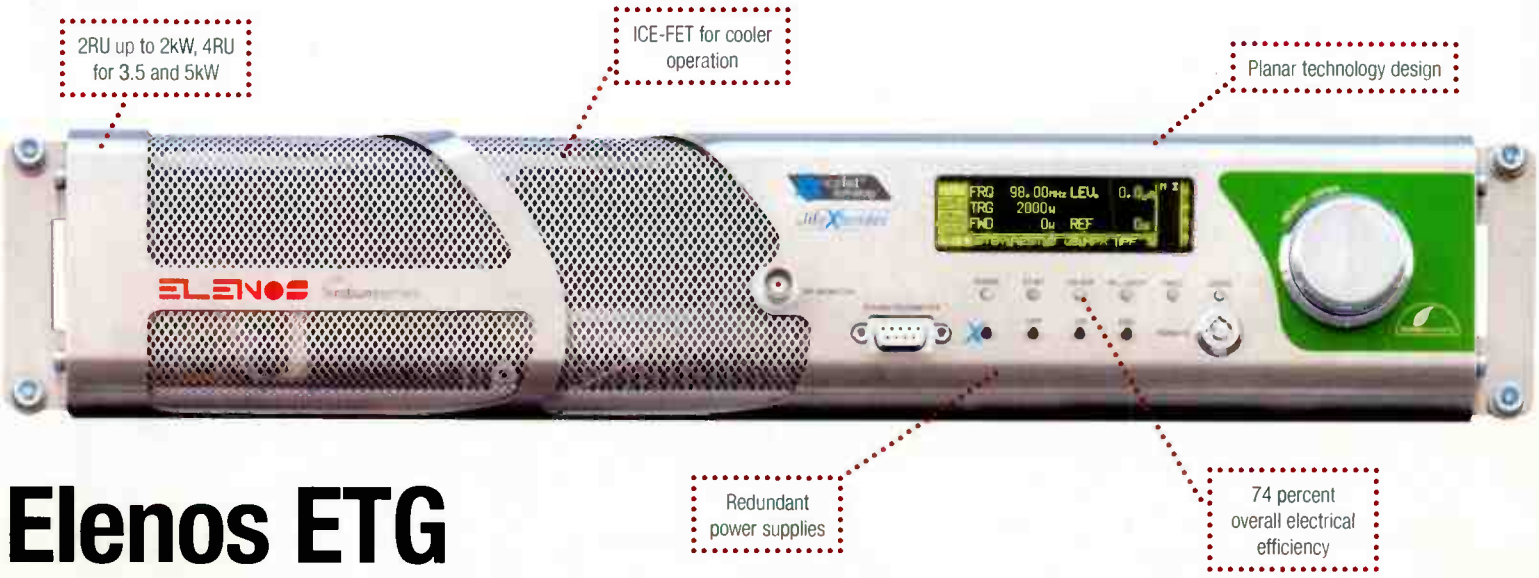

Elenos ETG

by Ronnie Tutor

This story has its beginning like many engineering service calls: An urgent plea of "Help, I'm off the air!" As I was on my way to a routine site inspection, I quickly decided to turn around and see what I could do to help a new client in need. Upon arrival I found the most immediate problem was a failed exciter. I was able to temporarily put the station back on the air with a substitute exciter. However, it quickly became apparent that the station's older 2.5K transmitter had seen its better days. Many things had been neglected over the years and some parts were being held together with homemade repairs and a prayer. After talking with KBLP's owner, I highly recommended a new transmitter for the site, as the cost to bring this old transmitter back to its better days would be very steep.

I began my search for an economical and efficient replacement that would meet my client's requirements. Very soon I found one transmitter that stood out among all the others in the power class: an Elenos. The Elenos ETG 2000.20 had all the right specifications to replace its predecessor, but it also had an elegance of design, efficiency, and all in an incredibly small and lightweight footprint. At first, my past experience told me it shouldn't be possible to fit so much in such a small box. I decided to contact Elenos, and I was assured the ETG 2000.20 could do everything advertised. The company even offered to ship me a demo unit to prove it to my satisfaction.

ELENOS
855-353-6670
elenos.com
ussales@elenos.com

Within a few days a demo ETG 2000.20 transmitter arrived. I lifted the new transmitter from its shipping box eager to put it to the test. I connected the transmitter to ac power and a test load and was transmitting at 500W in just a few minutes. I was amazed at how easy it was to adjust the frequency and power levels from the front-panel menu I called my client and made arrangements for a real-life on-air test.

INSTALLATION

The next morning I loaded the lightweight new contender into my truck and drove to the KBLP tower site. Once onsite I disconnected the old transmitter, deciding to set the new Elenos in the STL equipment rack. For convenience and safety I elected to connect the transmitter with a short 240Vac power cord to provide easy removal of power during any future service work. The RF connection was made via a $^{7}/_{16}$ DIN jumper that adapted to the station's existing $1^{5}/_{8}$" transmission line. Next, I turned the transmitter on for the first time in its new environment. After a quick power-up sequence, the menu displayed current power, status and audio modulation levels. Different main and sub menu parameters could be accessed and manipulated through the large, rotary push-button knob on the front panel.

Within the submenus multiple station profiles each with separate frequency and power level settings can be stored. Obviously the different presets would be very useful in emergency transmitter service for multiple site operations. Modulation levels were displayed clearly onscreen in kilohertz deviation and with a quick reference bargraph. I established a main profile for the station with its frequency and required TPO.

Next I connected a small interface called an E.Box, this provided Web GUI access for most of the transmitter's functions. In this instance the E.Box actually negated the need for a separate remote control. However, via a rear-panel DB25 connector, standard analog remote control connections are provided for traditional remote control systems.

Within 15 minutes I had made all the necessary connections. As the customer watched, I pressed the on button and the new transmitter whirred to life with a magical glow of its screen as it steadily increased power to 2kW forward power. There it was before me—almost unbelievably—this small technological marvel had replaced its 700lb power hungry predecessor.

After a few days the customer called with glowing reports of better sound and coverage than the station had in years. Needless to say, the customer wanted to keep the new transmitter and we finalized the sale and installation. It was decided that the old transmitter was to be permanently retired, with the new Elenos transmitter taking its rightful position as the new heart of KBLP, ready to serve the people of southern Oklahoma with pride for many years to come.

Tutor is owner of Tutor Consulting, Oklahoma City, OK.

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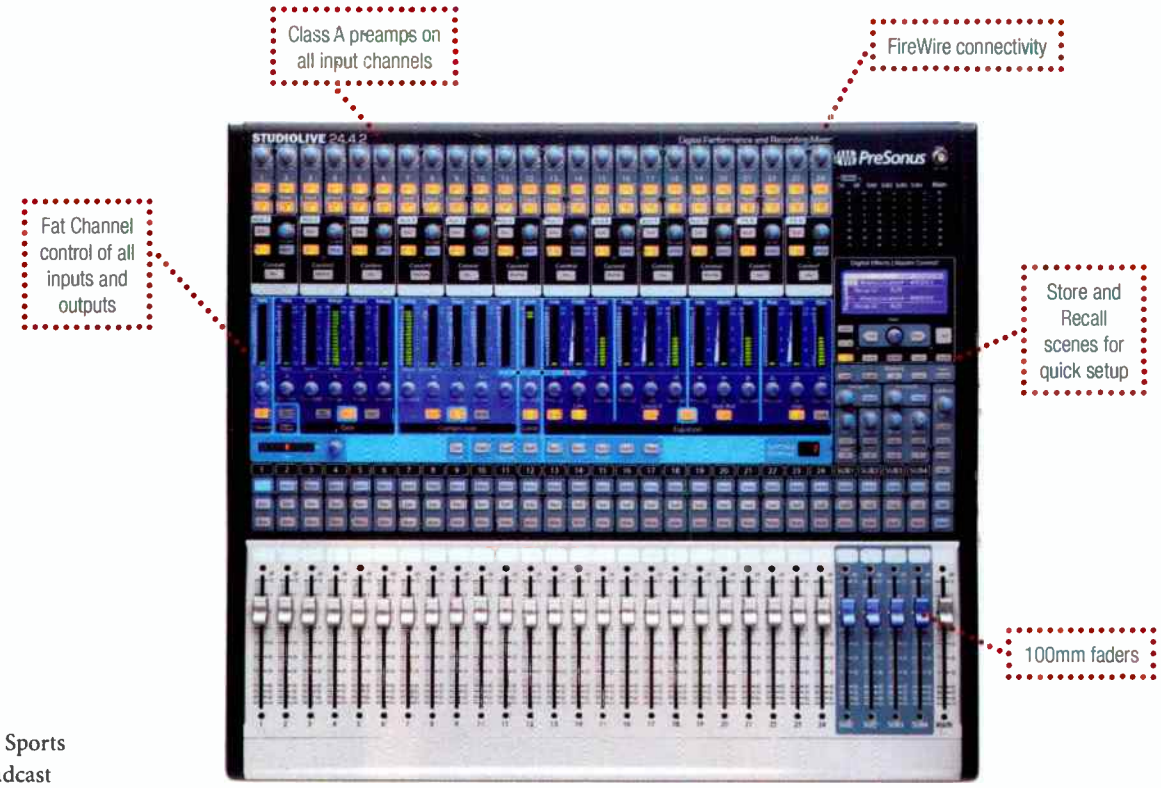
- Secure access to your system

Presonus StudioLive 24.4.2

by Chris Wygal, CBRE



For three decades Flames Sports Network Radio has broadcast Liberty University athletics to fans across Virginia. The network now includes a sizeable portion of North Carolina. As the football program has grown, so has the radio broadcast. The crew consists of eight on-air voices on game day. The road equipment rack has become very heavy. To tackle this problem the local pro audio shop suggested the Presonus StudioLive 24.4.2 digital mixer.

The digital mixer age has dictated that engineers let go of tradition. Huge equipment racks and heavy mixing surfaces are no longer required. It's now all a function of DSP, which provides better usability and takes up much less room. Outboard processing is closer to your fingers than ever. Once delved into, digital mixing is not as foreign as it may seem.

THE BACKFIELD AND PLAYING SURFACE

On the rear of the StudioLive are familiar XLR or 1/4" TRS input jacks and TRS insert points for each channel. The inputs are loaded with class-A preamplifiers. Aux and group outs are handled on 1/4" TRS jacks. Main L/R outs are found on XLR or 1/4" TRS jacks. The mono output uses XLR as well, and both L/R and mono have level adjustment knobs that will attenuate and boost levels from -80dB to +6dB. Control room outputs allow for studio monitoring and RCA jacks provide unbalanced tape ins and outs. The input for a talkback microphone is also on the back panel. A unique feature is a bank of three DB-25 connectors for efficient bundling of the 24 direct outs. Two FireWire ports allow for PC or Mac control and recording software integration. An S/PDIF jack allows for digital mains output. Two aux inputs live on 1/4" TRS jacks.

The StudioLive boasts 100mm faders, knobs everywhere and illuminated, military grade quick-touch buttons. Twenty-four input faders have gain adjustment (-15dB attenuation to +65dB gain), solo and mute buttons. The four subgroups and mains are positioned at their normal spots. That however, is where the normal mixer layout stops. Now we're back to the fact that the mixer is purely digital and it's where live and studio sound hit pretty hard.

The StudioLive has a section at the top of the mixing surface for phantom power assignable to each input separately. The inputs can double as FireWire inputs when used with audio playback from a computer. Next down are the aux and effects sends. Each input channel can be assigned to any 10 of the aux outputs and either of the effects inputs. The aux outputs have level control knobs and can be set up for pre or post fader use and can be soloed to headphones and/or speakers. The effect sends can be muted. I use six aux sends for individual mixes to talent boxes, feed lines in the stadium and wireless equipment. I don't use the DSP effects for football coverage; however, the built-in delay and reverb boast excellent pre-programmed acoustic effects. I have used the effects for live concert mixing and they are impressive. Plate reverb, tap effects and ping-pong delays are just a few from which to choose and create.

INTRODUCING "THE FAT CHANNEL"

Next we come to the Fat Channel. Each input and output channel has a blue select button. When any select button is pressed, the Selected Channel display indicates what the Fat Channel will adjust. Essentially, Fat Channel is a single channel strip for all the inputs and outputs on the mixer. Hi-pass filter, phase, gate, compressor, hard limiter and four-band EQ settings for all inputs and outputs are controlled by the Fat Channel. Frequency, Q width and gain are available on each EQ section. Threshold, ratio, attack, release and gain are available in the compressor and gate sections. The Fat Channel also features key filtering.

Comparable to its digital mixer contemporaries, the Fat Channel eliminates the need for a full-featured channel strip on each input channel, but more importantly those same features can be applied to every output as well. For example, I use compression and hard limiting on the main output of the StudioLive before it goes down the line to the network studio. By pressing the select button above the mains

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fader, all the Fat Channel settings for the main output appear right at my fingertips. Levels for each Fat Channel parameter are displayed on 16-segment LED meters.

Fat Channel adjustments are made with knobs. If, for example, I choose to give the announcer on input channel 5 more compression, I press "select" on channel 5 and make the adjustments in the Fat Channel. Making the Fat Channel available on all inputs and outputs was a well-thought out plan. Imagine the amount of rack space necessary to add outboard processing to all those ins and outs.

Just below the Fat Channel are input channel assignment buttons. Pan, subgroup and mains tell each channel where to appear in the mix. Stereo link allows the user to pair up odd and even channel numbers, which assists in making changes stereo sources. And the copy, load and save buttons allow users to copy Fat Channel and assign settings to another channels, saving a good deal of time.

STORING AND SAVING

The StudioLive features eight LED meters that indicate the selected channel input level, gain reduction and output levels for subgroups and mains. Below these meters is an LCD screen that deals with digital effects settings, and master control. Master control involves storing and recalling presets. This is handy for me each week. Instead of setting up the mixer and trying to get it exact each time, I can recall the scene for football games, and every setting pops right back into place. Below the master control screen are Aux Input A and B adjustments and settings, as well as sections for two-track tape in and out and headphone and monitor level adjustments and routing buttons. A mixture of tape, mains, soloed inputs and FireWire inputs can be sent to the headphone jack and control room output jacks. Talkback mic input attenuation and routing is also below the master control screen. The talkback mic is controlled by a latching talk button and can be routed to aux outputs 1-9 and mains.

One other great feature is the GEQ. Individual 31-band graphic equalizers can be turned on for the main outs, aux outs and subgroups. GEQ settings are controlled by the Fat Channel knobs.

GET ON THE BUS AND HEAD HOME

I have barely touched on all the features packed into the PreSonus StudioLive mixers. The small-format layout and simple operation are hard-to-match attributes. Cursory knowledge of mixing consoles provides all the know-how needed to quickly become familiar with the StudioLive. Plus, its construction, non-existent noise floor and premium head amps make it hard to turn down when rough handling and pristine studio audio is in order. From the football field to the recording studio, StudioLive is nearly impossible to beat.

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

SIDEBYSIDE

Newsroom Mixers

by Chriss Scherer, editor

It seems every station has a need for a compact audio mixing setup, whether it's in a newsroom, an audio ingest station (we used to call these dub stations) or small production room. They can also be used for co-host positions in an air studio. Calling these newsroom mixers is somewhat limiting given they often have uses outside the newsroom.

But like every mixer discussion today, there are two approaches: the stand-alone console and the audio network control surface. We include both in our search. Obviously, the raw hardware investment for a stand-alone mixer will be less than a surface designed to interface with an audio engine, but there are advantages to both. The control surface will tie to an expandable audio network, and with that comes the flexibility of tying into that network.

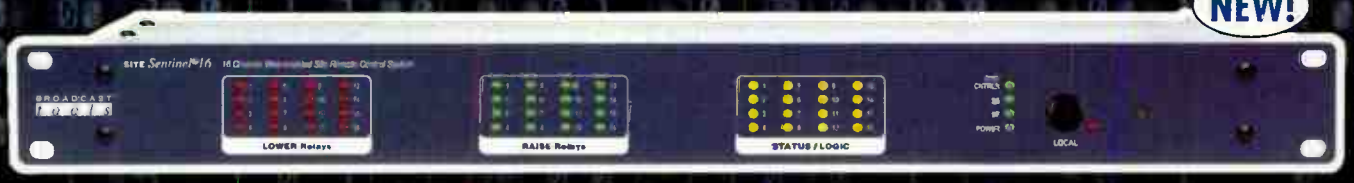
Every console manufacturer makes a small-format console of some flavor, but we looked specifically for models that are rack- or turret-mounted. Arrakis, Harris, Logitek and many others provide small mixers that certainly could be used in the newsroom setting. Some could even be mounted in a rack.

But for the purpose-built rack- or turret-mount options, we gathered specs on five models that offer a wide range of features and functions.

Model	Alesis iMultiMix 9R	Axia Raq	Dixon NM-250 MKII	SAS Rubi-T	Wheatstone SideBoard
Channels/faders	7	6	7	3 to 21	4 or 8
Audio inputs	5× mic/line, 2× stereo line, tape in, aux return	2× mic, 8× analog line, 1× AES3, 6× Livewire ports [2]	2× mic, 1× mono line (balanced), 2× stereo line (unbalanced), 2 stereo line (balanced), 2× talkback, off-air input	32 channel I/O with RioLink	minimum 8 [3]
Input note	Includes iPod dock [1]	Livewire ports are bidirectional I/O. One engine can accommodate two Raqs.	Front-panel 3.5mm input jack	Rack mount accepts up to 10 modules because of rack width.	Inputs on Blade are RJ-45 and DB9. One Blade can accommodate 2 Sideboards.
Channel display	-	yes	-	some modules	yes
Phantom Power	48V	48V	48V	-	48V w/ appropriate Blade
Channel on/off	-	yes	mics, phone and computer inputs	yes	yes
EQ	2-band per channel	per channel	-	-	-
Cue bus	-	yes	yes	yes	-
Audio outputs	stereo main, stereo monitor, 2× aux, iPod video	4× analog line, 1× AES3, 6× Livewire ports [2]	stereo program, mix-minus, sound card interface, monitor	four mix busses	stereo program, stereo audition [3]
Headphone out	yes	yes	yes	yes	yes
Talkback	no	yes	yes	yes	yes
Options			USB audio interface	turret or rack	turret or rack
Size	3RU	4RU	2RU	4RU	4RU
Meters	10-segment LED	OLED bargraph	10-segment LED	24-segment LED	20-segment LED
URL	alesis.com	axiaaudio.com	dixonsystems.com	sasaudio.com	wheatstone.com

[1] iPod connector fits iPod 5-7, Mini 1-2, Nano 1-5, Touch 1-2 [2] Using QOR.16 engine [3] Specific inputs and outputs depend on audio network.

Control Freaks



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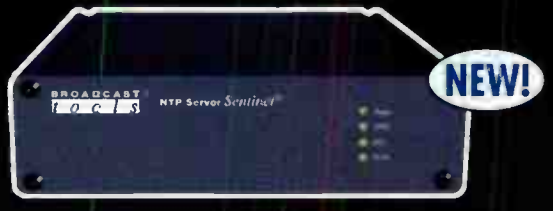

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20 years of *Radio* magazine

by Chriss Scherer, editor

The first issue of *Radio* magazine (originally titled *BE Radio*) was published in January 1994, but its roots go back much farther. In 1959, *Broadcast Engineering* magazine was launched to cover the technology of radio and television. By 1994, it was realized that while the two services are related broadcast efforts, the needs of their specific audiences warranted splitting the content into two publications.

Radio magazine, now part of the NewBay Media group of publications, continues to cover the technology of radio broadcasting. Now in our 20th year, we'll look back at the first year of publication, which had six issues.

Articles in the January 1994 issue featured:

> State-of-the-art remote broadcasts from anywhere in the world using a portable satellite phone and a Switched-56 telephone codec.

> Software solutions for talk radio detailed call-screening software.

> Weather services for radio stations discussed various methods of capturing the most accurate weather data.

> A triple-synchronous transmitter setup in for three stations along the Kansas-Missouri border.

> New products included the Auditronics Destiny 2000 console, the RE America 660/611 and 662/663 codecs, the HHB PDR1000 portable DAT recorder and the Computer Concepts DCS Live graphical interface for Windows. 0

CISCO PUBLISHES WORLD-WIDE MOBILE WEB STATS FOR 2012

Cisco has analyzed the data and come up with the facts about mobile data traffic during 2012 and published it in their Cisco Visual Networking Index Global Mobile Data Forecast update for 2012 to 2017 (the details of which are available in this white paper). The salient points, however, are listed below.

> Global mobile data traffic grew 70 percent in 2012

> Last year's mobile data traffic was nearly twelve times the size of the entire global Internet in 2000

> Mobile video traffic exceeded 50 percent for the first time in 2012

> Mobile network connection speeds more than doubled in 2012

> In 2012, a fourth-generation (4G) connection generated 19 times more traffic on average than a non-4G connection

> The top 1 percent of mobile data subscribers generate 16 percent of mobile data traffic, down from 52 percent at the beginning of 2010

> Average smartphone usage grew 81 percent in 2012

> Smartphones represented only 18 percent of total global handsets in use in 2012, but represented 92 percent of total global handset traffic

> Globally, 33 percent of total mobile data traffic was offloaded onto the fixed network through Wi-Fi or femtocell in 2012

> Android is now higher than iPhone levels of data use

> In 2012, the number of mobile-connected tablets increased 2.5-fold to 36 million, and each tablet generated 2.4 times more traffic than the average smartphone

Source: cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.pdf

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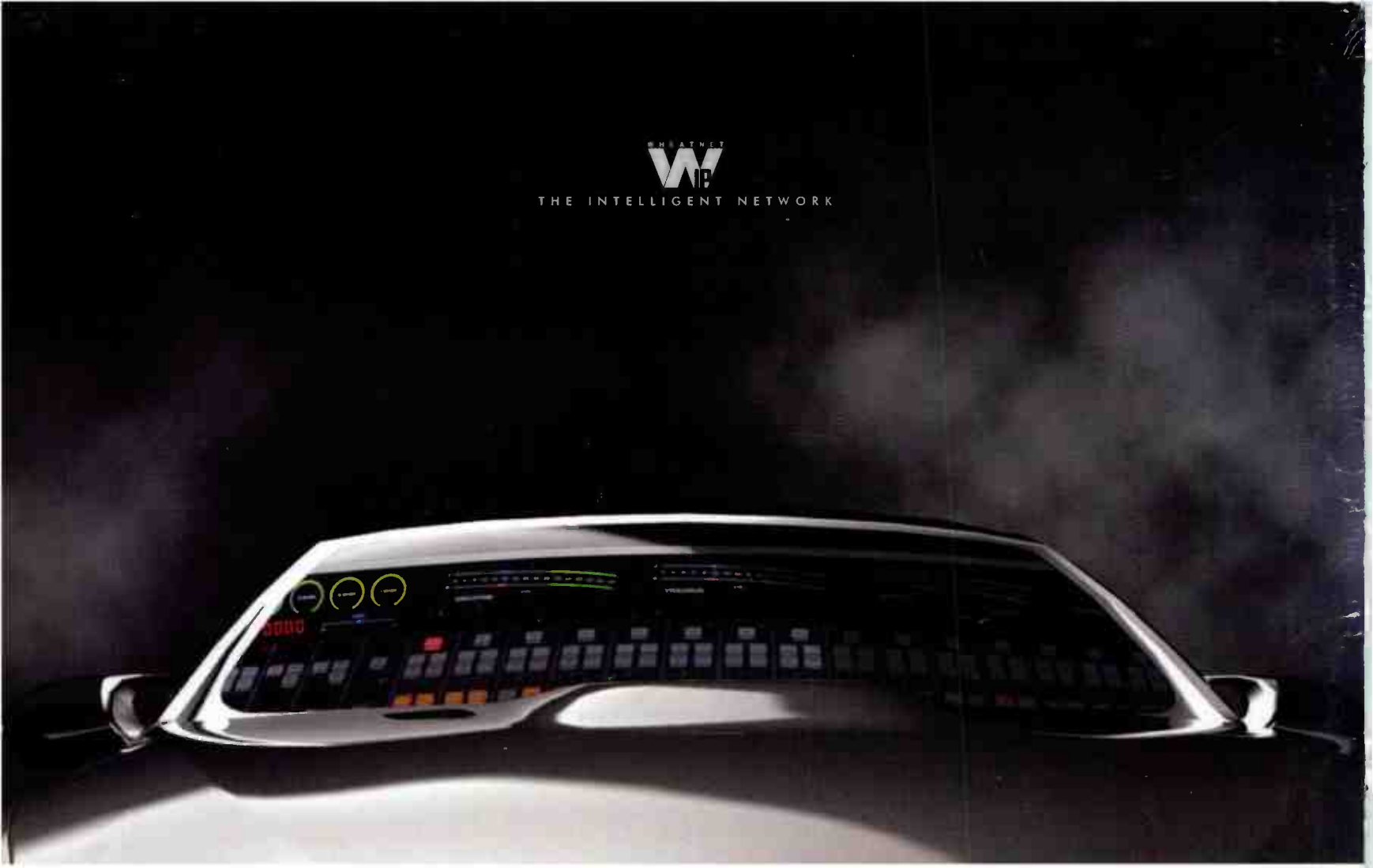

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