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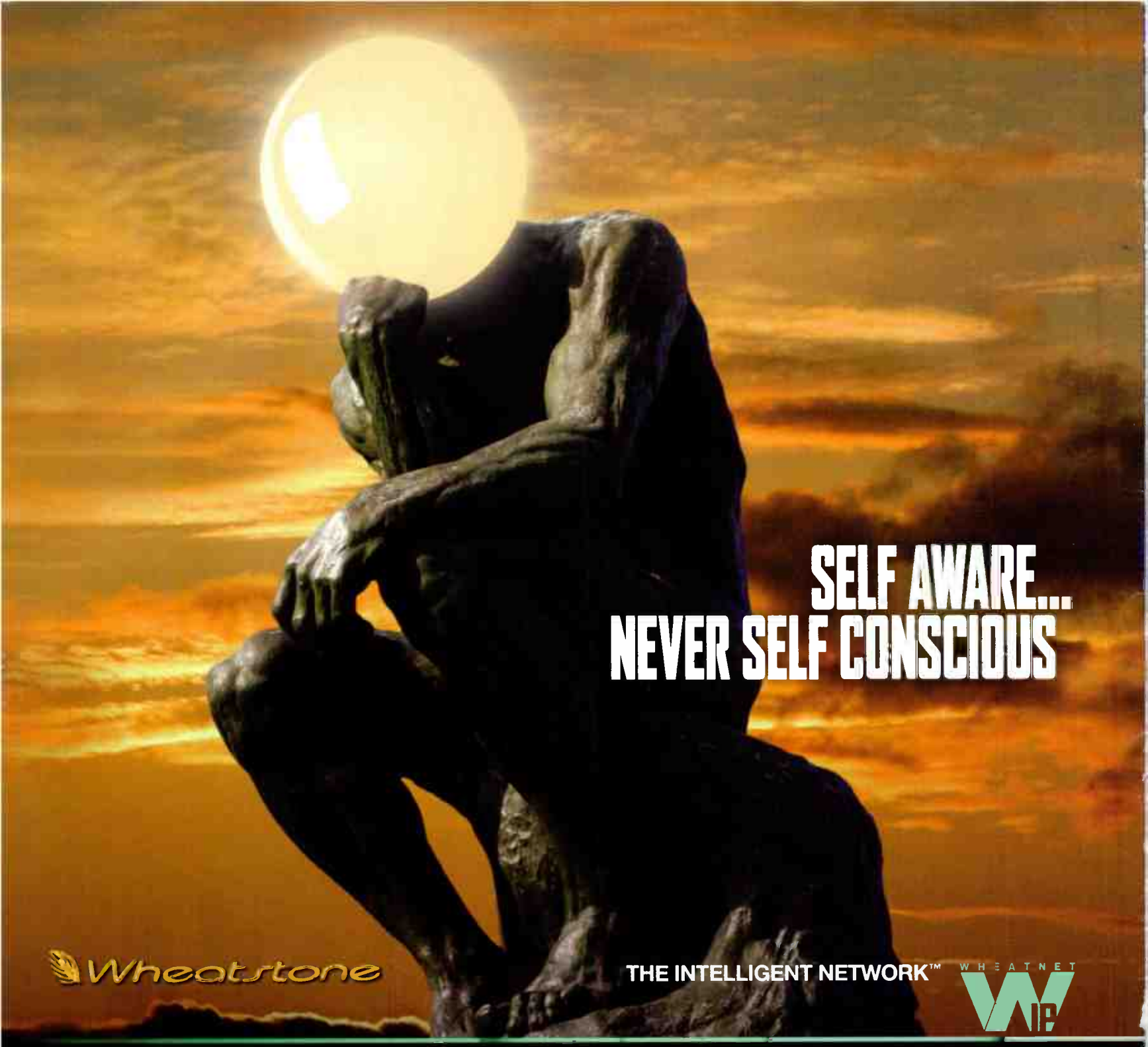
Radio

THE RADIO TECHNOLOGY LEADER

Backstage at A Prairie Home Companion

DECEMBER 2011 | RADIOMAGONLINE.COM



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COLUMNS

DEPARTMENTS

Introducing the Mic Adapter

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FEMA Post-national EAS Test Webinar Reviews Lessons Learned

On Nov. 29, a 90-minute webinar was held by FEMA to discuss the information gathered following the Nov. 9, 2011, national EAS test. At the peak there were nearly 950 people logged in to the webinar. The intent of the webinar was to look at the success and lessons learned, address the top challenges of the test, provide observations from the field, ways to improve on the shortcomings, and propose some next steps for national EAS. *See the full story online for an outline of the webinar.*

For more of the latest EAS news, check out the following stories online:

> FEMA's Centeno Offers Thoughts on National EAS Test

> FCC/FEMA: EAS Test Served its Purpose

> National EAS Test: How Did You Do?

NRSC

The National Radio SysteÙ Committee (NRSC) released a new report that presents the results of a quantitative analysis on program associated data (PAD), specifically on the number of characters needed to display song title, artist name and album title fields. *For a link to the free full report, visit RadioMagOnline.com.*

Wheatstone released a 22-page white paper offering advice from 26 processing experts to help radio stations enhance their relationships with listeners through better use of technology. Topics include basic tips for more successful processing, advice on deploying processors, and specific elements that processing pros look for to identify clean sound.

Delaware Court Issues Stay in Automation Patent Proceeding

The U.S. District Court for Delaware issued a stay in the pending lawsuit filed by Mission Abstract Data (MAD) against CBS, Beasley, Cox, Cumulus and Entercom for patent infringement in the technology used in common radio station automation systems. The group owners (the defendants) filed for the stay.

The group owners asked for the stay pending the reexamination of the patent by the U.S. Patent and Trademark Office. In late October 2011, the U.S. PTO dismissed several aspects of the MAD claim as they applied to the technology used by radio stations. The Delaware judge, Leonard P. Stark, still feels the U.S. PTO could rule in favor of MAD. The stay allows the U.S. PTO time to complete its review.

The stay ordered the defendants to provide their evidence of non-infringement to MAD by Nov. 17, 2011. MAD was then to reply to the group owners by Nov. 18, 2011.

RAB: Radio Sees Seven Consecutive Quarters of Growth

Radio's 2 percent 3Q2011 increase to $4.527 billion caps seven consecutive quarters of upward momentum. Revenue for year-to-date through September 2011 is also up 2 percent over the same period last year, to $12.891 billion.

MORE ONLINE Find the link for the full report at RadioMagOnline.com

Revenue	$ 3Q2011	% Change	$ YTD 2011	% Change
Spot	3,665	Flat	10,499	Flat
Network	282	2%	824	2%
Digital	190	17%	524	18%
Off-Air	390	10%	1094	8%
Grand Total	4,527	2%	12,891	2%

Source: Miller, Kaplan, Arase & Co. Figures are based on a pool of more than 100 markets and extrapolated to the entire U.S.

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 Jan. 10. Be sure to include your guess, name, job title, coÜany name, mailing address and phone number. No purchase necessary. For coÜlete rules, go to RadioMagOnline.com

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Sound Forge Pro 10
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VIEWPOINT

Passing the Test

The first nationwide EAS test was held on Nov. 9, and while it did not go exactly by the book, it is safe to consider the test a success despite the troubles. The test was sent right at 2 p.m. ET as planned, but it the originating EAS unit's time clock was three minutes fast. That confused some people and few EAS units that delayed relaying for three minutes, but it had had no effect on the overall test. The real problem occurred a few seconds after the test began.

The test was distributed via the PEP station network and through the NPR squawk channel. The Nov. 29 FEMA webinar reported no problems with the NPR feed, but there was a problem with one PEP station that appears to have caused a delayed echo loop through the entire system.

A short time after the test began, a second set of EAS headers was heard, albeit at a slightly lower level. This echo repeated at a reduced level throughout the test. Digital Alert Systems analyzed the audio, and the delayed tones came from PEP station WCCO. The Nov. 29 FEMA webinar clarified that PEP stations received the test feed via a phone bridge, and it the feed from WCCO got back into the phone line and was redistributed.

With the duplicate headers, some EAS units played the audio feed as it was, while others muted their audio outputs once the second header was received. For the units that muted, the test audio got to "This is a test of the Emergency Alert System ..." and then stopped.

During the test, I listened to two commercial radio stations and watched the PBS affiliate. I also recorded two commercial TV stations. The radio stations and the PBS station ran the test fine, although their EAS units muted the audio on the second header. The two commercial TV stations had problems. One did not air the test at all; the other started the test but did not carry the EOM.

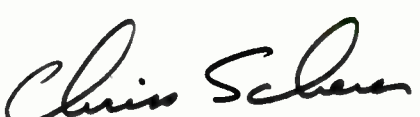
Despite the trouble, many still consider the test a success, including the FCC and FEMA. Before the test, I know many engineers were worried about not passing. This wasn't a graded test in that respect, and I said from the start, if it fails, let it fail. That's how we will learn where the holes are. Still, some stations were looking for ways to patch the system before it occurred to ensure they would pass.

Regardless of any good-intentioned pre-test efforts (successful or not), we have obviously found a few holes in the system.

The FEMA webinar did not say when the next national test would occur, but it could be as soon as mid-2012. There may also be some closed-circuit tests. I have heard some stations say they will not participate because of the problems. I understand the reaction, but unless all stations participate, it won't be an accurate national test.

Perhaps FEMA will originate tests to the PEP stations with an RMT or demo code to ensure the first link in the chain is fixed. And the chain itself is still an issue. While most would prefer a more direct means of distributing a message to all stations, in a real crisis, the broadcast stations are still the best suited and most ubiquitous method of distributing information to the public and to each other.

The analysis of this test will be used to plan for the next test, but I also expect the results will be taken into consideration for the expected rewrite of the Part 11 FCC Rules on EAS.



Chriss Scherer | Editor

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Characteristics of MPLS Networks

by Kevin McNamara

You may not be familiar with the term Multiprotocol Label Switching (MPLS); however, it is a technology that will find a way into your facility in the not-too-distant future, if not already utilized. What exactly is MPLS? At the highest level, MPLS is a highly scalable alternative method to route different types of data through a common network. In a broadcast environment MPLS would permit the mixture of protocols, including those used for video, audio and traditional IP traffic, over the same network. MPLS is typically deployed within a wide area network (WAN) and can be provisioned using copper, fiber or wireless microwave radio transport media.

HISTORY

The roots of MPLS go back to 1996 when a group from Ipsilon Networks proposed a technology called IP Switching, which at the time, was designed to only work on ATM networks. Cisco was the first to call it Label Switching, which was introduced as a similar proprietary protocol. In 1997 the first MPLS working group was formed and the first deployment of an MPLS network was completed in 1999.

MPLS has been closely compared to an ATM (Asynchronous Transfer Mode) network, and while it shares some of the same characteristics – i.e. connection oriented transport services – they are very different. Perhaps most notable is that ATM can only handle fixed-sized packets, while MPLS can work with a multitude of protocols and data packet sizes. MPLS networks tend to be more secure as they can broadcast specific packets of data to specific destinations as opposed to an IP network broadcast, which provides little security over who might be able to receive data.

ABOUT LABEL SWITCHING

Conventional IP routing typically works in Layer 3 of the OSI model, otherwise called the Network layer. You may recall that this is the portion of the OSI stack responsible for forwarding data packets, including the addressing, forwarding and routing functions. IP routing also requires a great deal of management to track the source and destination addresses in order for the data packets to be routed to the proper destinations in the most efficient manner. While IP routing can be very efficient there is still a high degree of latency (relatively speaking) due to this management overhead.

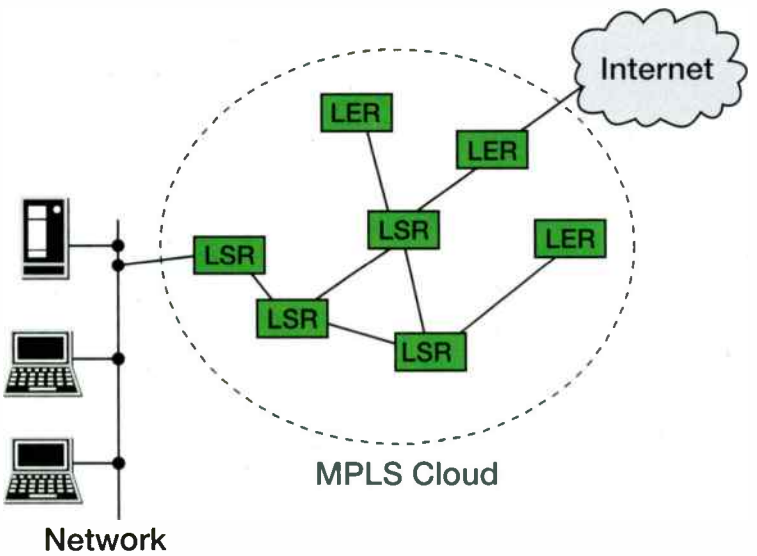


Figure 1. An MPLS cloud has data enter through an Ingress Edge Router (LER), travel through the Label Switch Router (LSR) and then back to an Egress Edge Router to its next destination.

Unlike IP routing, MPLS utilizes so-called labels to send data frames to other MPLS networks. Not unlike the typical information that encapsulates data packets in an IP network, labels contain certain information about the data; however, they are not made part of the original IP packet, rather they are inserted between Layer 2 (Data Link) and Layer 3, in essence tagging the MPLS stack to the beginning of the IP packet. I use the term stack because the label is essentially a virtual layer within the OSI stack between Layers 2 and 3. Some people refer to MPLS as Layer 2.5. It is also possible to stack more than a single label, which is used in certain routing applications.

The label consists of the following information:

The label: 20 bits (which can yield approximately 1 million different labels)

Class of service: 3 bits. This provides the ability to prioritize up to seven different levels of traffic.

Stack bit: 1 bit. This defines whether or not this is the last MPLS Label in the frame. Remember I mentioned that there can be multiple labels in a frame.

Time-to-live: Defines how many different MPLS routers can be traversed before the packet dies.

NETWORK ARCHITECTURE

In terms of hardware requirements MPLS utilizes three main components:

> Ingress Label Edge Router (LER): Provides insertion of the Labels

> Egress Label Edge Router (LER): Strips the labels and forwards the IP data as necessary

> Label Switch Router (LSR): Essentially manages the labeled packets, including swapping old labels with new labels (as it passes the label to the next router) and a host of other management functions.

Label Distribution Protocol (LDP). Two LSRs create an LDP session, permitting the exchange of label and stream information. This information consists of:

Notification Messages: Providing error feedback and other advisory information.

Session/Adjacency Messages: Establishes maintains and terminates sessions with other LDP devices.

Advertisement Messages: Creates, changes and deletes label mapping information.

Discovery Messages: Announces and maintains the presence of LSR devices.

Label Switched Path (LSP): This is a unidirectional tunnel created between any two LER devices. LSP must be used in order to forward any MPLS data.

Perhaps an MPLS network can be best viewed as a cloud. Data enters the cloud through the Ingress Edge Router, travels through the Label Switch Router and then back out to the Egress Edge Router onto to its next destination. Figure 1 (page 10) provides an example.

DEPLOYING MPLS IN BROADCAST

There are several characteristics that set MPLS apart from an IP based network, particularly as a means to connect groups of radio stations, both regionally and nationally. Here are a few reasons to look at it:

> MPLS supports bi-directional data paths.

> Properly designed MPLS networks are very scalable and fault tolerant.

> Easy to configure.

> Supports any protocol, thus allowing the ability to carry several different infrastructure requirements over a single network i.e. voice and data traffic. Operational and capital expenses are significantly reduced.

> Priority levels can be assigned to specific types of data.

> Network latency is less than traditional IP routing.

> No need to utilize channel banks i.e. DS1, 2, 3, etc. Bandwidth is allocated based on need and priority.

MPLS networks are well suited to handle the demands of the largest broadcast groups as well as smaller local operations.

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

A Change in Interference Protection Rules?

by Lee Petro

Protection. In cars, it's the dual-side curtain air bags. On rollerblades, it's the person in front of you when you inevitably fall. In broadcasting, the protection from interference afforded by the Federal Communications Commission largely depends on the type of broadcast service.

For example, in the non-reserved FM band, interference protection comes from the spacing requirements imposed on FM allotments. The Commission's rules prescribe specific distances between FM allotments, based on the assumption that the facilities are operating at the maximum power and height permitted under the Commission's rules. On the other hand, in the AM and noncommercial FM services, interference protection is only provided to the edge of the particular service contour. In the digital television service, the Commission uses a hybrid version, which allots new facilities using the same type of spacing requirements used in the FM service, but then permits minor changes to existing facilities based on rules similar to that in the AM, noncommercial FM, and FM translator services.

A recent petition for rulemaking filed with the Commission would change the interference protection rules for the non-reserved FM band to largely match the rules in the other services. SSR Communications, Inc., a broadcaster in Mississippi, proposed that the Commission abandon the spacing rules, and instead only provide interference protection based on a FM station's actual contour. SSR argued that the current interference protection rules were established when the commercial FM service was still young, and the fact that FM stations have been using the rules for more than 25 years eliminates the need for the belt-and-suspenders approach to interference protection. SSR also argued that the proposed change in rules would permit the modification of facilities that have found themselves foreclosed from the changing community of license by the recent Rural Radio proceeding.

Several parties filed supporting comments, agreeing with SSR that the rules should be changed. While the association of FCC engineers passed on taking a position on the rule changes at this point in the proceeding, some existing broadcasters, including the Mississippi Association of Broadcasters, urged the Commission to proceed with the changes proposed by SSR.

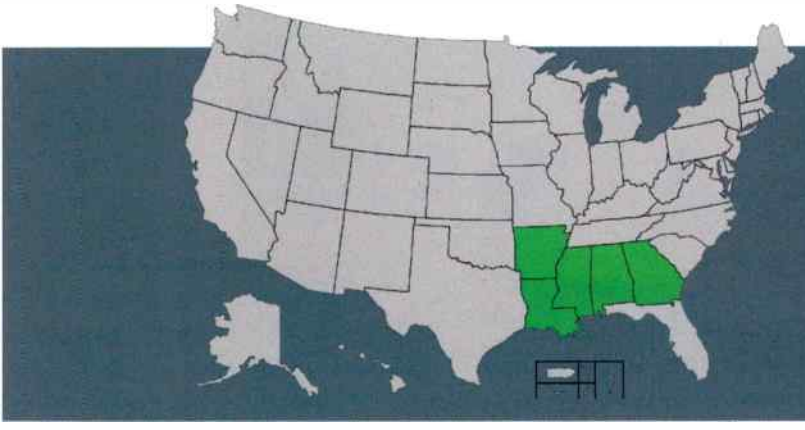
On the other hand, the National Association of Broadcasters and a coalition of broadcasters filed opposing comments. Its opposition centered mostly on two points, that the FM band would become too cluttered with the resultant lack of clean signals, and that the rule changes would foreclose flexibility for existing broadcasters when they needed to make minor changes.

With respect to the first point, the opposition noted that interference issues caused, in part, by the contour-protection methodology that SSR has proposed have plagued the AM band. The parties referenced the more-recent efforts taken by the Commission to impose greater protections in the AM service, and argued that the non-reserved band could suffer the same result.

Moreover, the parties noted that the adoption of the proposed rules could result in the inability of broadcasters to make future minor changes to their facilities. Since it is common for broadcasters to change their transmitter sites based on landlord disputes and zoning issues, the parties argued that the proposed changes could make future modification more difficult, perhaps forcing a station to reduce power if it was hemmed in by surrounding stations. Finally, the parties noted that the recent changes in the Rural Radio proceeding were meant to foreclose more movement of radio stations into the urban markets, and the proposed rules would likely encourage more changes of this sort.

Now the FCC will decide whether or not to issue a notice of proposed rulemaking. Given the effect of the proposed rule changes, it is likely there will be more activity in the next stage should the Commission proceed.

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



DATELINE

Dec. 16, 2011: Stations in Georgia and Alabama continue running License Renewal Post-Filing Announcements on Dec. 16, 2011, and Jan. 1 and 16, Feb. 1 and 16, 2012.

Dec. 16, 2011: Stations located in Arkansas, Louisiana, and Mississippi continue running their pre-filing announcements on Dec. 16, Jan. 1 and 16, 2012.

Dec. 27, 2011: EAS participants must submit reports on the results of the first Nationwide EAS Test held on Nov. 9, 2011.

Feb. 1, 2012: Stations in Arkansas, Louisiana, and Mississippi file License Renewal Application and EEO Program Report. Noncommercial stations also file their Biennial Ownership Report (FCC 323-E).

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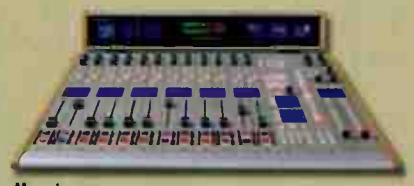
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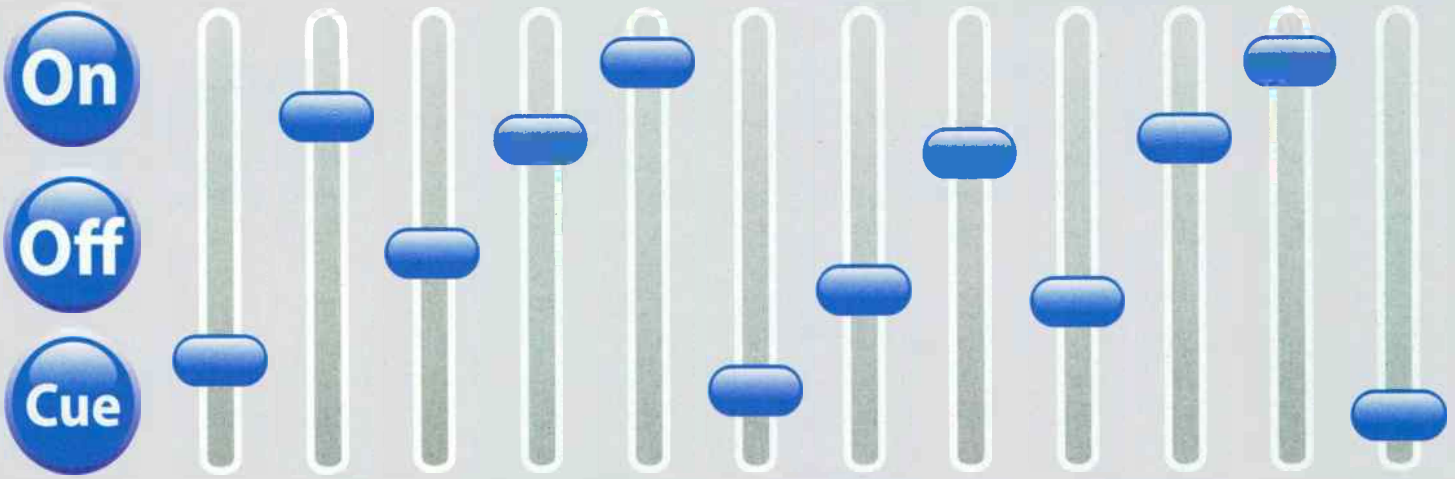
Ethernet-based Audio Routing: A how-to guide

By Doug Irwin,
CPBE DRB AMD



OUR THEORETICAL RADIO STATION

- Two identical studios, built as main and alternate main
- Either studio will be able to handle on-air duties including remote broadcasts. Either will be able to operate as an island unto itself on the air.
- All audio sources will be available in either studio or in the rack room.
- Some dayparts of this station use a combination of satellite audio and automation. During those dayparts, neither studio will be on-air. A mixer of some sort will derive the program, and feed the STL link.
- A legacy STL is fed by analog or AES.
- There are three remote sources: satellite receiver at the transmitter site, two in the rack room. Each needs its own mix-minus, routable from either studio.
- Each studio has a telephone hybrid.

Start Here

So the decision has been made to rebuild old studios, or to perhaps build anew. There are several ways to accomplish this goal, but for our purposes let's say you are leaning towards an audio-over-IP system, even though you haven't really selected the brand. To remove some of the mystery, I'll look at the differences between the products of three manufacturers by designing a hypothetical radio station, and then seeing how the different systems fit in with our ideas about how we want this all to work. The basic specifications for the functionality of this imaginary radio station are outlined in the sidebar.

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Figure 1a

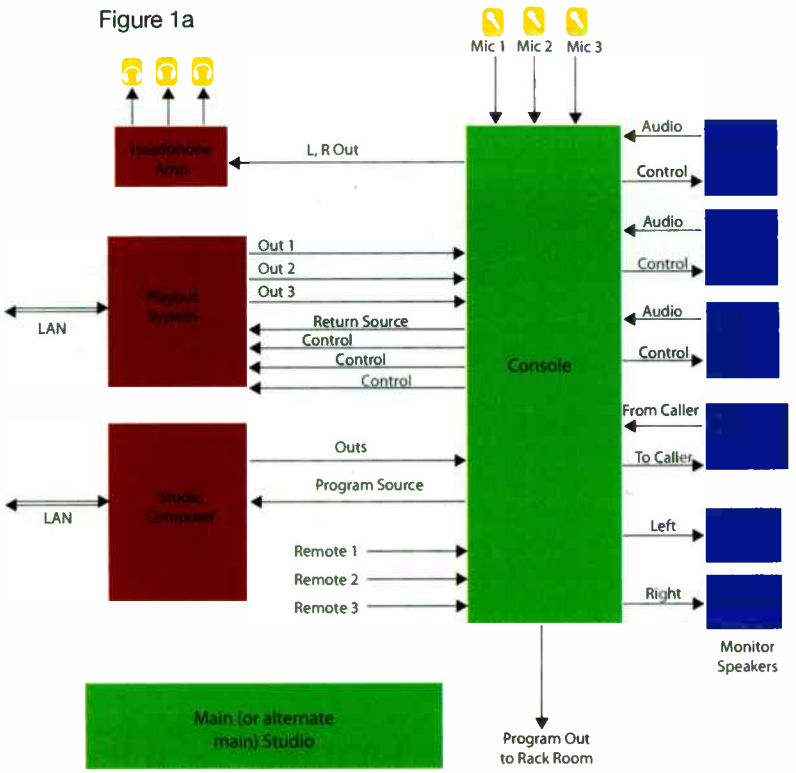


Figure 1b

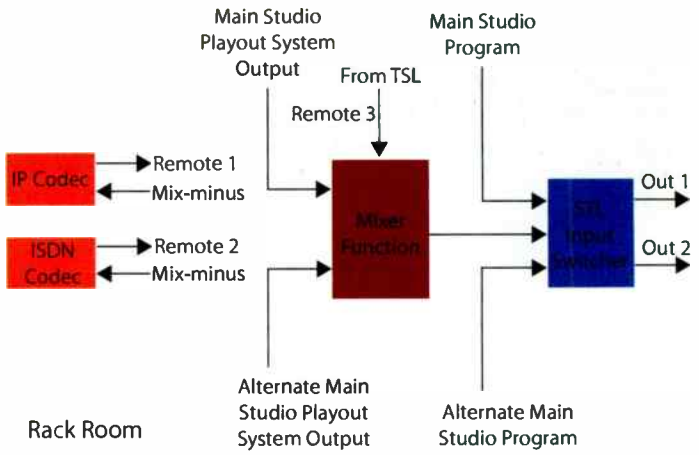


Figure 1a shows the proposed architecture. They are identical with respect to recording and playback, and the automation system is dedicated to its studio. A studio computer records and edits audio, and retrieves audio via the Internet.

Either studio can be selected for the input of the STL switcher, which resides in the rack room. A mixer (real or virtual) is in the rack room to feed specified dayparts of automation plus satellite audio to feed the STL switch.

The router feeds both station STLs, but we'll assume copper from both air studios so that, in the very unlikely event of a core switch failure, the station won't be knocked off the air.

The rack room also contains two local sources for remote broadcasts; both are duplex links that require a mix-minus feed coming from one of the two studios. Obviously those feeds need to be routable, because one person could be doing an on-air shift in one studio, while a remote broadcast goes on in the other studio. Additionally, we have a source coming back from a remotely located satellite receiver that lives at the transmitter site.

Let's investigate ways to build this system based on real hardware.

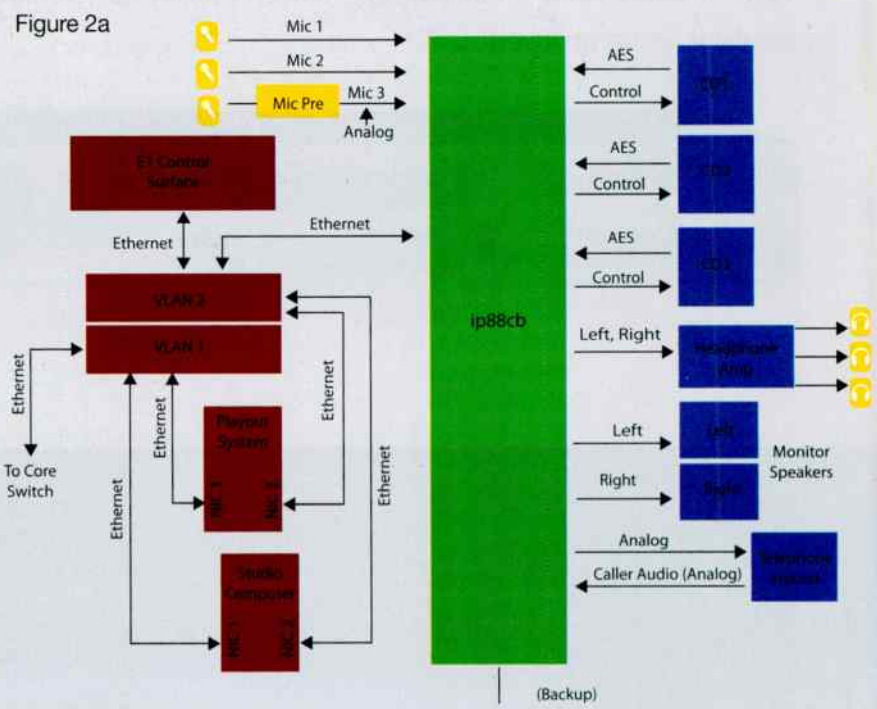
SOLUTION: WHEATNET E1

Both studios are built as shown in Figure 2a. The heart of each is the Wheatstone E1 console, in conjunction with what Wheatstone refers to as the console blade, which in this case is the ip88cb. The ip88cb and the E1 are connected with an edge switch. Our requirement for three mics requires (at least) one outboard mic preamp since the ip88cb has two built-in. Both the playout system and the studio computer are interfaced to the Wheatnet IP System by Ethernet and the appropriate software drivers. (Both have dual NICs so they can be accessed on either VLAN.) This single Ethernet connection handles both audio and control. The CD players are connected to the ip88cb by AES3. Control is via GPIO.

The analog inputs (with the exception of the mic inputs) and AES inputs connect to the ip88cb with RJ-45 connectors, so an interface cable to go from RJ-45 to XLR is called for. These can be made in-house, or prefabricated versions from StudioHub can be used. StudioHub can also provide the logic break-outs as well, since they also appear on the ip88cb as RJ-45 connectors.

Legacy program outputs and the control room monitors are available via XLR connectors on the ip88cb. Headphone outs and cue amp outs come out via 1/4" TRS.

Figure 2a



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WHEATNET E1 CONTINUED

Figure 2b shows our requirements in the rack room can be accommodated by a Wheatstone ip88a, which is another blade, with analog ins and outs. (This could just as easily have been an ip88d, by the way). Normally the STL input switcher is fed by an output of the ip88a, but in the unlikely event of a core switch failure, the switcher will take a legacy feed from either studio. The ip88a also accommodates the needs of the two codecs, making their audio feeds available anywhere on the network. It does the same thing for the satellite audio that comes back from the transmitter site.

The ip88a has a built-in utility mixer that can be programmed to take care of the mixing function described in the station design – allowing both studios to be off-line for certain dayparts. Sources to be mixed come in via the network.

The core switch handles multiple VLANs, one of which is for the office LAN, and one of which is for the Wheatnet segment. I make mention of that because it is important to note that Wheatnet can run on the same switch as an office LAN, as long as VLANs are used appropriately. This goes for the edge switches as well.

Configuration of the system is done with software Wheatstone calls Navigator. This will run on a PC that has access to the network that the various Wheatnet elements reside upon.

Figure 2b

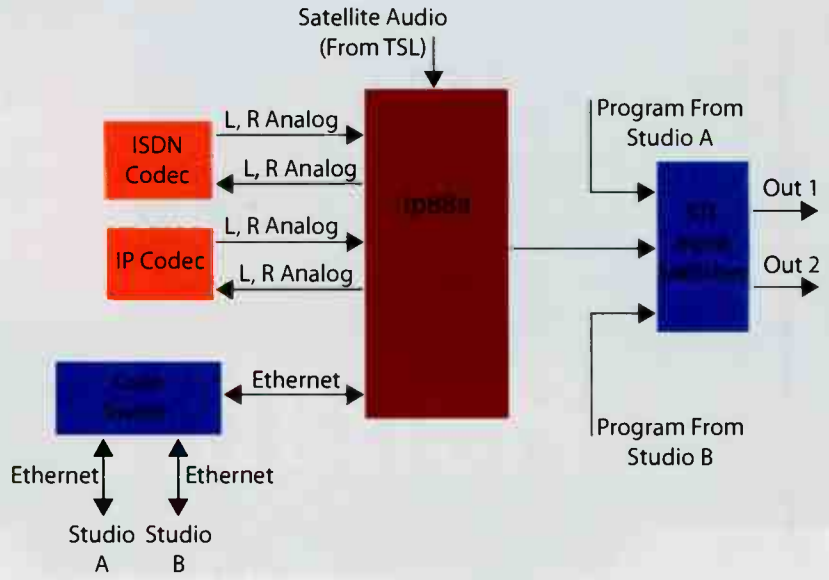
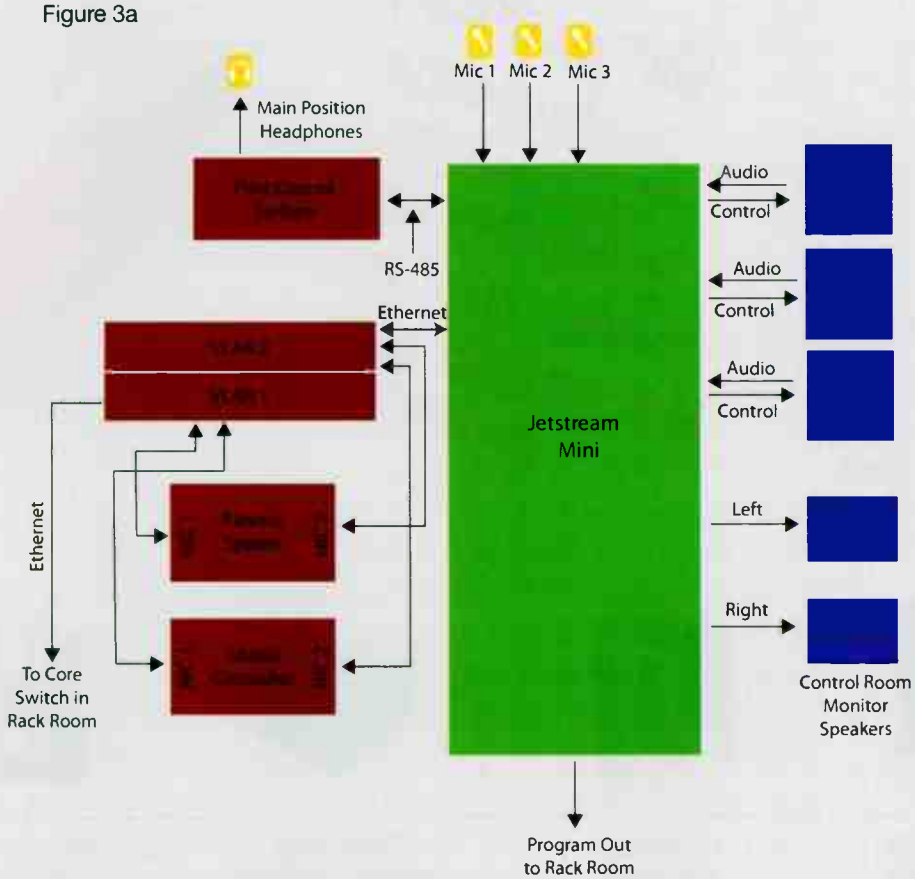


Figure 3a



SOLUTION: LOGITEK PILOT

Figure 3a shows our system configured with a Logitek Pilot. The heart of each is the Pilot control surface, integrated with the Jetstream Mini (via RS-485), which performs the mixing and routing functions. With the Jetstream Mini, plug-in cards are specified to get the functionality that is needed. In this case the Jetstream Mini would require a microphone input card (that has four mic inputs); two of the four-input AES cards; and two of the four-output cards (analog or AES). The interfaces for these cards are RJ-45 connectors on the rear apron of the Jetstream Mini itself, so cabling interfaces are required. (Again, make them in-house or buy them prefab.) The GPIO connectors on the back of the Jetstream mini are DB15F, so you may need to plan to build out those connectors as well.

In this example, both the playout system and the studio computer are interfaced to the Jetstream Mini by Ethernet and the appropriate software drivers. (Both have dual NICs so that they can be accessed on either VLAN.) One Ethernet connection then handles audio and control.

Figure 3b (page 20) shows the rack room setup with another Jetstream Mini accommodating our design. Three remote sources come in, one being the satellite audio returned from the transmitter site via the TSL. The Jetstream Mini would be used to mix the satellite audio with either the studio A or studio B playout systems (via network routing) for certain dayparts so that

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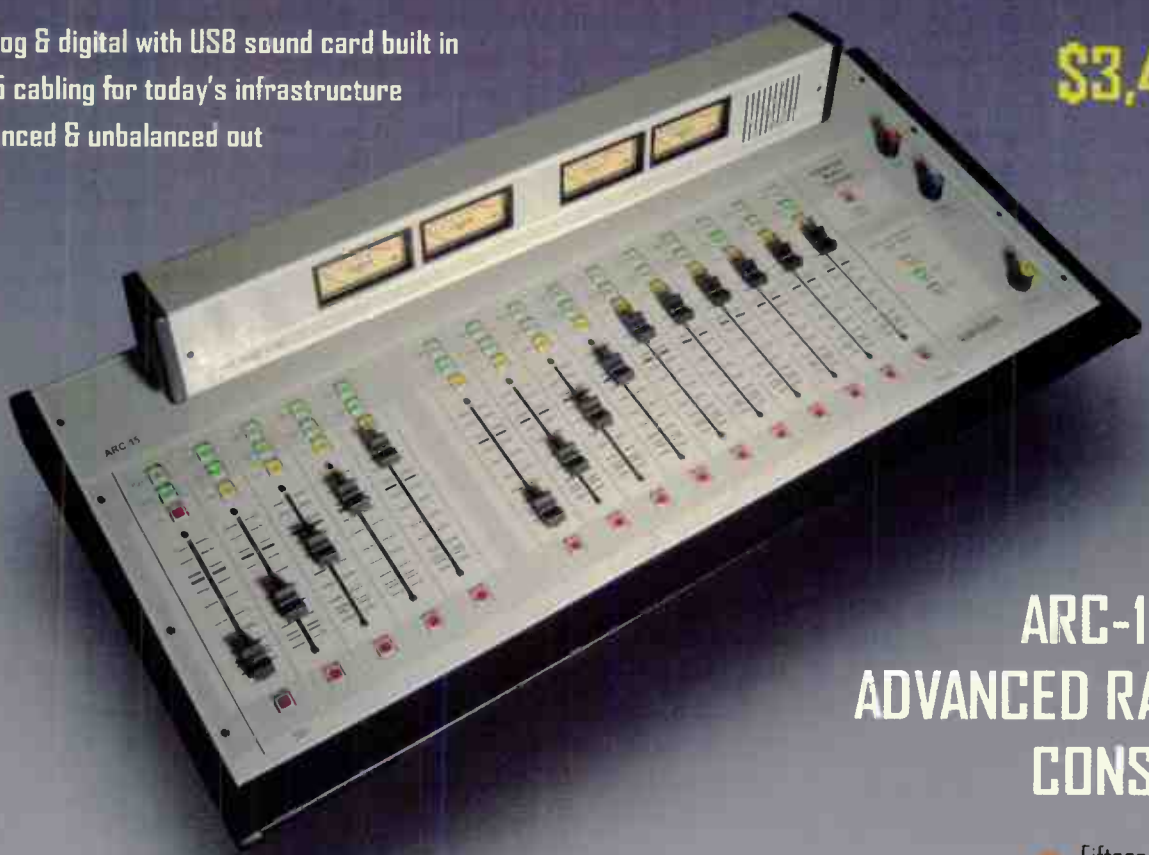

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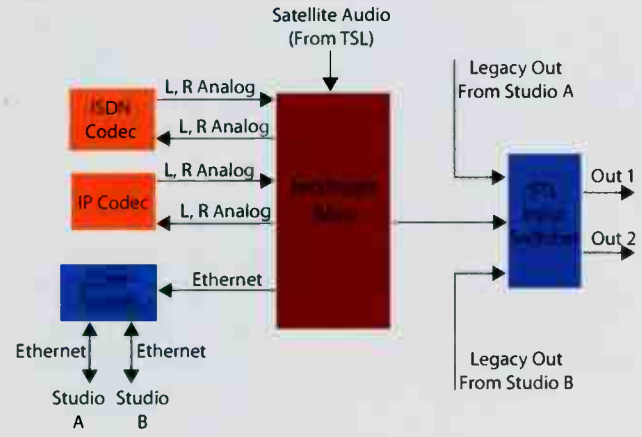
Figure 3b



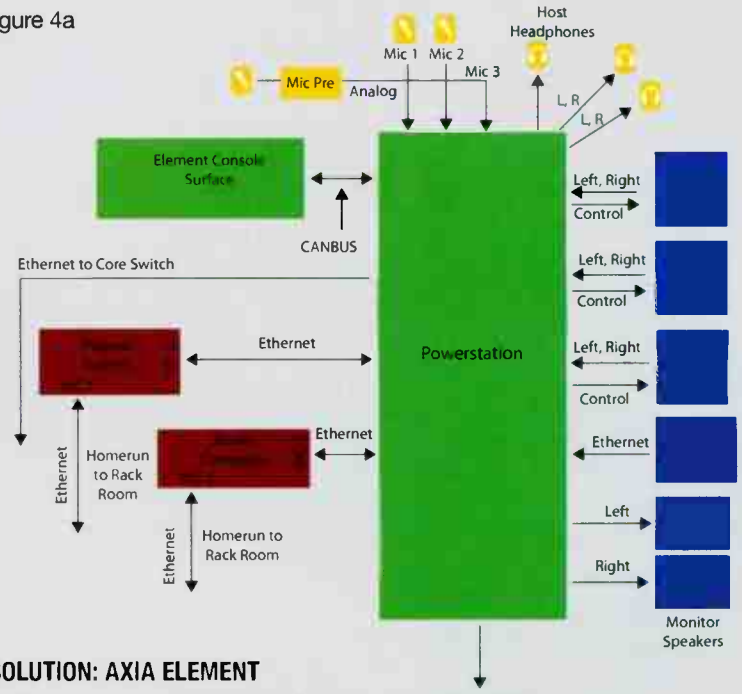
LOGITEK PILOT CONTINUED

both studios can be off-line during those periods. Obviously that makes the studios available for other uses, or maintenance windows. An output of the Jetstream Mini is used to feed the input to the STL switcher, but the legacy feeds are available to the STL switcher just in case something should happen to the core switch that knocks out the LAN (and therefore the audio routing).

The other two of course are the remote broadcast devices – an IP codec and an ISDN codec. Their send/receive needs are serviced by the Jetstream Mini.

The core switch handles multiple VLANs, one of which is for the office LAN, and one of which is for the Jetstream segment. I make mention of that because it is important to note that Jetstream can run on the same switch as your office LAN, as long as VLANs are used appropriately. This goes for the edge switches as well.

Figure 4a

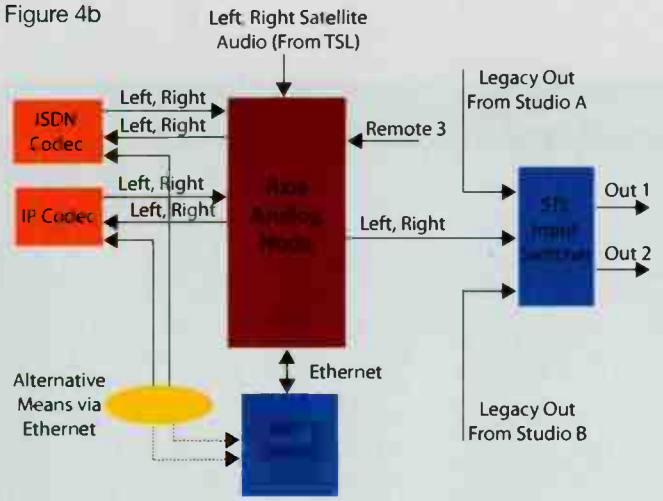


SOLUTION: AXIA ELEMENT

Figure 4a shows our setup with an Axia system. The Element control surface works in conjunction with the PowerStation. The PowerStation has two mic inputs, so the third mic needs an external pre-amp, the output of which would drive one of the analog inputs of the PowerStation. Three CD players are connected by their analog outs; GPIO is used for their control. Headphone outputs as well as the studio monitors are driven from analog outs of the PowerStation. The legacy output for the rackroom feed could be analog or AES. Connections are made on RJ-45 connectors.

Axia uses a proprietary protocol running over Ethernet called Livewire. Devices that support Livewire are physically connected to the system (for their audio and control) through this Ethernet connection known as a Livewire port. While it is completely feasible to use equipment that does not have the Livewire support (AES outputs, for example), in this particular example I've put one device in with it: the telephone hybrid. Via its Livewire port, this device gets its appropriate

Figure 4b



mix-minus feed, and returns the caller audio back to the network as well.

In this design the playout system is connected to the Axia network via a set of software drivers that are installed on it. For this reason it needs to have an Ethernet connection to the PowerStation. So that it can be accessed by the station LAN as well, it has a second NIC connected to the LAN via a homerun. The studio CPU is configured similarly.

An Axia analog node is installed in the rackroom, and one of its outputs is used to drive an input of the STL input switcher. Sources would be mixed virtually and come in to the analog node via the network. A legacy feed from either studio is available in the unlikely event of a network failure. This same node services the needs of the ISDN codec, as well as the IP codec. Potentially you could install an IP codec as well as an ISDN codec with Livewire ports; in that case they would be connected to the Layer-2 switch directly. This is shown as alternative means in the Figure 4b.

Configuration of this system is done via Pathfinder software running on a PC attached to the Axia network. Again, if you need outside access, that same computer will also need an additional NIC so that it can also be on the office LAN.

LAYER-2 SWITCH CONSIDERATIONS

Clearly you should pick a switch type and brand after consulting with the AoIP vendor that you choose; each will be able to recommend certain models, certified to work in their particular systems. If your intent is to use multiple VLANs then you will need managed switches. If you maintain a ready spare, make sure you save all the switch configurations, (after the system is up and running) so that the spare can be configured properly should it need to be used.

Irwin is transmission systems supervisor for Clear Channel NYC and chief engineer of WKTU, New York.

Tom Keith, Tim Russell, Sue Scott, Megan Fischer and Garrison Keillor on stage during the broadcast of "A Prairie Home CoÜanion."

A Prairie Home Companion

A look backstage at one of America's most-loved radio programs

By Chriss Scherer, editor

"A Prairie Home Companion." It's a radio program that just about everyone knows. The show's creator and host Garrison Keillor launched the show in 1974 in St. Paul, MN. The idea was to create a live stage show for radio in the style of the "Grand Ole Opry." In that time, "A Prairie Home Companion" has easily reached (and surpassed in the opinions of some) the same level of public recognition.

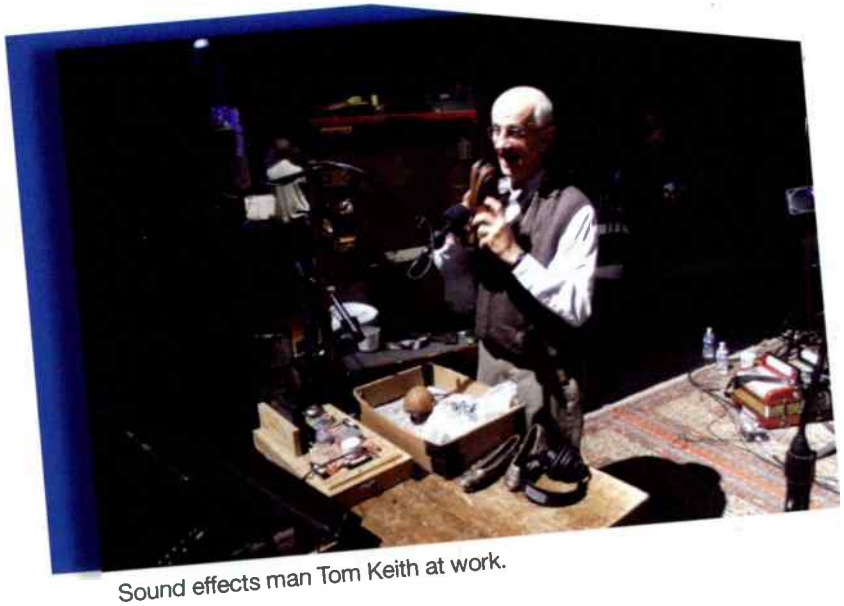
I attended a performance of the program on Sept. 24, 2011, and I was able to arrange a visit with the production crew for most of the day of the performance. David O'Neill, station relations and media manager, provided me with access to all areas backstage and on-stage. I spent a great deal of time with Sam Hudson, producer/audio engineer, and Tom Scheuzger, broadcast/transmission engineer, as well.

On the surface, final production of the show looks like a group of people just having a good time, which we know is part of the magic of a good production. The performers and technicians don't make it look like work.

Show production is actually an on-going process. While Keillor writes ideas for the script on an on-going basis, the final elements are decided by the rehearsal on Friday. Guests are

Garrison Keillor goes over program changes with Sam Hudson (right to left), while Tom Scheuzger and Noah Smith continue preparations for the broadcast.

Final preparations are made before the doors are opened and the audience enters.



Sound effects man Tom Keith at work.

also arranged on-going; some are booked months in advance, others are booked the week of the broadcast. It's this flexibility that requires everyone involved to be aware at all times, and be ready to make on-the-fly adjustments as needed.

Keillor leads a talented troupe of performers, including actors Tim Russell, Sue Scott and Fred Newman. Tom Keith handled the sound effects, done in the old style with shoes, hardware, bits of random debris and his own voice at times. (Keith unexpectedly died in October 2011.) The music is provided by The Guy's All-Star Shoe Band, led by keyboardist Richard Dworsky, with Pat Donahue (guitar), Gary Raynor (bass) and Peter Johnson (percussion).

At stage left is the broadcast equipment set up. This is where Hudson and Scheuzger, along with engineer Noah Smith, spend their time. Entrenched behind a Yamaha PM1D, they mix the audio for the radio feed, and they handle the monitor mix for Keillor and the band. Front-of-house mixer Tony Axtell handles the monitor mix for the rest of the performers.

With the broadcast mix engineers sitting on stage – right next to the production – much of the broadcast mix is prepared while listening to headphones. There are monitors over the console, but they can't be turned up too loud during the show. Some monitoring and mixing is handled on the speakers, mainly so Hudson and Scheuzger can save their hearing from non-stop headphone use. But their experience also comes into play to create the broadcast mix. The broadcast engineers have been involved in the production long enough to have a good feel about where to set levels.

However, headphones do have one advantage: They are a consistent point of reference. When the production takes to the road, the listening/mixing environment changes. In these cases, the headphones provide a known listening environment.

There is a sound booth in the back of the hall, and for years, the broadcast mix was created in this booth. While this provided a more ideal mixing environment, it restricted communication between Keillor, who makes changes as needed on the fly, and the broadcast feed. The broadcast mix position was moved to the stage for one production because of some specific set up need, and it has stayed there ever since.

During the rehearsal, I watched an ongoing stream of program revisions come through. There's a printer in the racks behind the broadcast mix, and production assistants have temporary setups on stage right during rehearsal to accommodate the regular changes. The fine-tuning goes on continuously.

The crew rehearses on Friday to run through the material for the Saturday night broadcast. Those segments are not in order of the final show, but they provide the technical crew a chance to hear segments and set preliminary mixer scenes. After this run-through, scripts are edited and tweaked for the rehearsal on Saturday afternoon, and a rough program order is created. But even during the Saturday rehearsal, the scripts are tweaked up to (and even sometimes during) show time.

The final broadcast program order is set about an hour before air time. And while the order is set, it's not easy to know how a live audience will react. Also, the pace of a scripted piece may go faster for the live audience. Sometimes elements are cut,

sometimes elements are added back in. The Guy's All-Star Shoe Band has a song or two at the ready if needed. For the broadcast I attended, the show's musical guest, Nick Lowe, had four songs prepared, three of which were sure to be on the program. The fourth was a standby if it was needed. Lowe ended up playing all four songs.

The entire production uses 40 to 84 mics at any given show. The mixing console has 96 inputs, so there is a limit to how many audio feeds can be taken. In addition to the mics to capture the performers, there are also audience mics to pick up the applause and laughter, which complete the aural canvas of the broadcast production. All the audio sources are split between the two Yamaha consoles (one for broadcast, one for house).

Performers on stage have open monitors and headphones. In-ear monitors were considered, but Keillor often talks to performers directly, and pulling out an in-ear monitor was not practical. The headphones are fed from final stereo broadcast mix. There is no IFB in the monitor. The broadcast mix also feeds some speakers on stage that are provided for the audience seats behind the performers.

The broadcast begins at 5 p.m. CT. About 15 minutes before show time, the band takes the stage and begins to play. Minutes before show time, Keillor comes out and says a few words. The audience listens and waits for the top of the hour. The organized chaos of the past two days comes together and the broadcast begins.

The live broadcast is recorded in multitrack to Protools, and there is also a stereo mix recorded as a backup. There are also two DVD

EQUIPMENT LIST

Some of the equipment used in the production of "A Prairie Home Companion"

Audio-Technica AT4031, U855
Crane Song STC-8
Lexicon MPX 500
Mackie SRM150
Neumann KM184
Shure KSM32, KSM9, SM57, SM58, SM86
Tascam CD-O1U
Tascam DV-RA1000
TC Electronic M3000
Worldcast APT Eclipse
Yamaha PM1D

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CAT 5 cables for all input/output

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recorders running; one gets the show with all the intros and credits, the other is clean without the intros. A CD player provides the show's intros and credits for playback.

During the broadcast, the stereo broadcast mix is sent across the street to the studios of Minnesota Public Radio via an equalized copper pair. From there, the program is satellite uplinked from MPR for distribution. As a backup, an ISDN feed also carries the program via a Worldcast APT Eclipse codec. These codecs are also used when the show is broadcast from other locations. In the still rare situations when ISDN is not available, a C-band satellite uplink truck will be used.

After 37 years, "A Prairie Home Companion" recalls the days of the classic radio variety show, but takes advantage of modern tools to create a unique listening experience. Classic radio lives on from its regular home in St. Paul, MN.

The Guy's All-Star Shoe Band provides the music for the broadcast.

ABOUT THE FITZGERALD THEATER

Built in 1910, the Fitzgerald Theater holds the claim of being Saint Paul's oldest surviving theater space. It was originally called the Sam S. Shubert Theater to honor the brother of entertainment-industry leader Lee and J. J. Shubert. It was patterned after the Maxine Elliot Theater in New York.

The first production staged at the theater "The Fourth Estate," a Joseph Medill Patterson and Harriet Ford play about a reporter working for a major metropolitan newspaper who found hiÜelf in court fighting the influence of powerful advertisers. Opening night was Aug. 29, 1910. The theater was also extensively used to produce vaudeville productions.

When the theater opened, author F. Scott Fitzgerald lived in St. Paul and was about to celebrate his 14th birthday. Fitzgerald would later write "The Great Gatsby."

Over time, the theater evolved with the times. In 1933 it was renovated to be a movie theater and renamed the World Theater. In 1981, Garrison Keillor brought "A Prairie Home CoÜanion" to the World Theater. Keillor led the charge to rename the theater in honor of St. Paul native F. Scott Fitzgerald.

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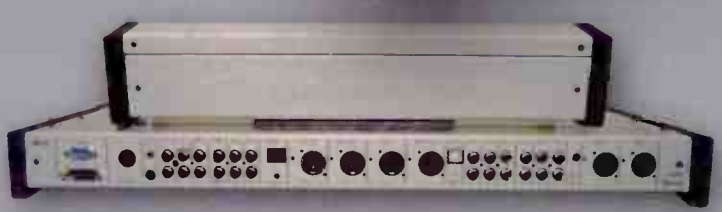
ARC-10UP... $1,999
ARC-10BP... $2,495

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



CAT 5 cables included on the ARC-10BP

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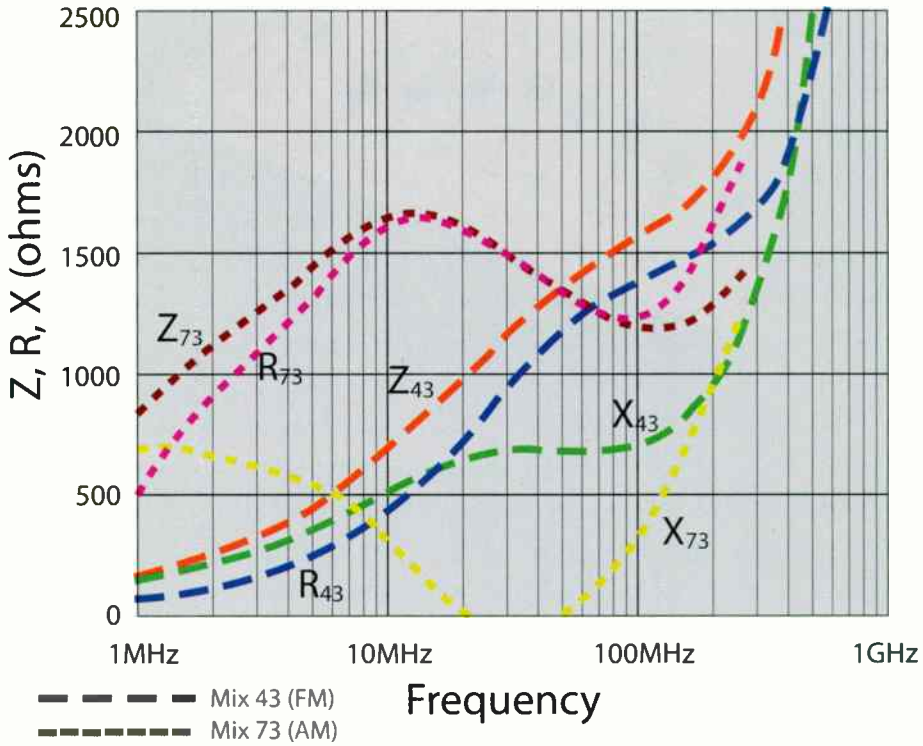
More on Ferrites

by Doug Irwin
CPBE AMD

Picking up where we left off last month – how to use ferrites to solve RFI problems, such as those caused by an AM or FM transmitter close to a neighborhood or even businesses – let's look at some practical solutions.

I'll mention ferrite beads first mainly because I think this is the least likely thing you would end up using. Beads of course slip over individual wires, and their use would in almost every case involve unsoldering a wire, slipping a bead over it, and then re-soldering. I doubt your neighbors are going to be very keen on the idea of you opening up their electronics and modifying it, so let's move on.

More likely you'll end up using toroids or split beads, or some sort of in-line filter. Toroids offer perhaps the most practical solution to many cases. The offending cable is literally run right through the toroid, and if possible, wrapped around it. This can be any cable that fits: audio, coax, CAT-5 cables. Remember the idea here is to mitigate common-mode noise (RF) that is basically the same on all the conductors. In the case of shielded cable (or coax) the idea is to suppress RF from flowing on the shield itself. There are at least two good sources of toroids for this purpose: One is Palomar Engineers. Another is Fair-rite. In fact, Fair-rite also has ferrites for RF suppression on flat and other ribbon cables as well.



IÜedance, resistance and reactance coÜarison for mix 73 vs. mix 43 materials.

As with any ferrite purchase, make sure you get the correct mix for the frequencies you are trying to suppress: For AM, use mix 73; for FM, use mix 43.

SPLIT THE DIFFERENCE

Split beads are especially useful when the cable is just too thick to wrap through a toroid. These are beads that are split longitudinally, and fit in a plastic housing that snaps the bead halves together snuggly. The diameter of the cable going through has to be smaller than that of the hole so that the bead halves can fit together well; don't worry about the actual cable being smaller than the hole diameter though. Again, both Palomar Engineers and Fair-rite are possible sources. Be careful in buying surplus beads unless the material type is specified.

There are many sources for pre-made filters for RFI suppression. One of the most interesting suppliers is Mike Sandman for anything to do with RFI in telephone systems. Sandman has also published his own RFI analysis troubleshooting tree. I'd also like to point out that Sandman sells an RFI suppression filter for Ethernet as well (10BaseT and 100BaseT).

Another source for telephone RFI filters is K-Y Filter. You can also look at the Web page of Industrial Communications Engineers for its RFI filters. Unfortunately it looks like ICE isn't taking orders (as I write this) but hopefully later on it will resume. It is my understanding that ICE also makes filters for Ethernet.

You are not necessarily on-the-hook to solve RFI problems generated by a transmitter in or near a neighborhood, but often times it's good politics to help out.

Sandman RFI analysis troubleshooting tree: www.sandman.com/files/RF-flow1.pdf.

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

RESOURCES

Fair-rite | www.fair-rite.com
Industrial Communications Engineers | www.iceradioproducts.com
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Harris PR&E NetWave

by Bob Klima

Radio stations WCTO-FM and WLEV-FM serve the Allentown-Bethlehem-Easton market in eastern Pennsylvania, what is known locally as the greater Lehigh Valley. The two stations offer a mix of local and syndicated programming, following a model that creates a unique listening experience for local and Web audiences.

Both stations have rosters stacked with local talent, broadcasting live from our consolidated studio facility. While the Allentown-Bethlehem-Easton market is firmly entrenched in the "medium market" world, local broadcasters have access to a large base of listeners. Arbitron's latest figures rank the market at number 69 on a list of 282 U.S. radio markets.

The challenge boils down to staying cutting-edge in an active market that may not pull in the financial numbers of a New York or Philadelphia. This means giving our on-air and production staff the tools they need to broadcast a high-quality on-air product while remaining within budget.

CONSOLE REQUIREMENTS

We set our sights on the studio environment, with a focus on upgrading our on-air consoles. There were two primary requirements: The consoles needed to operate in a stand-alone manner today, with the capability to expand to a networked solution in the future.

We looked at many available options and contacted SCMS. Our sales representative Doug Tharp immediately suggested that the Harris PR&E NetWave digital on-air console would meet our requirements.

The NetWave is built for situations such as ours. It can function without the need of router or CPU connectivity, allowing a station to essentially plug in, assign sources and get on the air without hassle.

Taking it to the next level seems simple. Harris offers a network activation kit that serves as the control surface for an entire networked audio infrastructure. This essentially makes each input available anywhere on the network.

The NetWave itself does not require the purchase of an additional box in the studio, which helps to keep costs in check. All networking is accomplished on board, within the console. This minimizes the chance of failure, localizing the rare troubleshooting process.

We like the idea of the dual-fader network option. This comes in the form of an upgrade kit that supports input labeling and toggling between sources, allowing operators to flexibly assign sources to each fader without numeric limitation.

We have no plans to change the microphone faders and automation faders. The NetWave makes for an ideal choice in this case as we can upgrade the modules we want without being forced to pay for those not needed.

GENERAL FEATURES

The general feature set is ideal for our on-air needs. Most importantly, the NetWave comes standard with two mix-minuses, with the option to triple the amount to six. The NetWave also allows you to assign full mix-minus and Telco features to any two faders on the console. This flexibility gives the

on-air staff reasonable input as to where the Telco faders are assigned.

Still, the future possibilities are what truly impress.

Most radio facilities that have gone the networking route have been steered to the consolidated networking architecture. This is a fine solution of massive studio operations with multiple studios, where everything on the network ties back to a central routing system. Harris offers a reliable system for this approach in its VistaMax range.

It makes far more sense to localize the networking options for a facility of our size. This is why we are leaning toward a distributed networking architecture based on Harris's new PR&E range of distributed audio networking devices. We are particularly interested in the VMExpress and VMConnect products, which deliver a 32×32 localized network routing solution for under $7K.

The system is easily expandable should we need to add another router and double the I/O capability to 64x64. All connections from console to router are made via simple CAT-5 connections, minimizing the wiring infrastructure within the studios. This feels like the perfect fit for our two studios as our needs evolve.

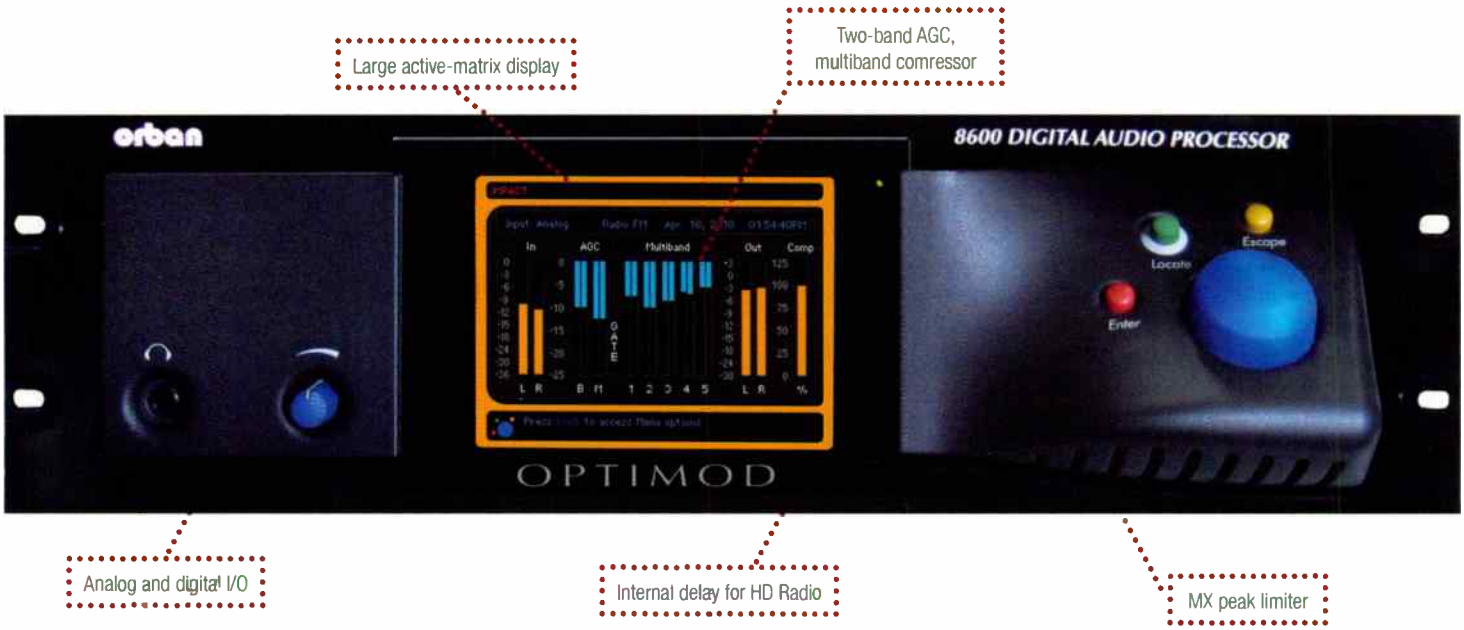
INSTALLATION

Installation was simple. The NetWaves used the same familiar connectors as the previous consoles we were replacing, making it a matter of simply relabeling each input. The sensible layout and intuitive nature made setting levels and programming the console easy. This was accomplished under the hood, further centralizing and simplifying the setup process. The hassle of crawling around under the console and tinkering with a GUI at a laptop for hours was eliminated.

User-friendliness extends from the operator to the engineer. The light, compact 2RU universal power supply made life easier during the integration process. Training the staff to use the new NetWave consoles also proved easy. The console retains the looks and feel of a traditional on-air console while offering the modern flexibility that digital studios require today. It is easy to add sources and adapt to changes from the board operation perspective. The on-air staff report positive feedback on its look, sound and operation.

With the NetWave operating in standalone fashion today, we have made great strides in out studio upgrades by adding two 24-fader consoles to our facility. The project was done well ahead of time and came in under budget. We look forward to adding the VistaMax networked audio solution to our system in the near future.

Klima is chief engineer for WCTO-FM and WLEV-FM, Bethlehem, PA.



Orban Optimod-FM 8600

by Bill Eisenhamer

Discussions of processing appear regularly, as it is the final product of a radio station. Every year new products come out and each has good and bad points. Today I am given the opportunity to look at one of the better products on the market – one based on history and progress of technology.

Like many products today, the physical installation of the equipment is straightforward. If you own an 8500 processor, drop this in its place and run. Standard XLR-type connectors for analog and AES audio, along with other connections, are clearly marked. An AES11 Sync input is available if you provide a house clock. Subcarrier (SCA) inputs are available as expected. Two composite baseband outputs come standard, too. The shopping list of interfacing does not stop there with two serial ports for connecting with legacy equipment via modem or a quick computer hookup, a remote interface in a DB25 form, and an Ethernet RJ-45 port to connect with a network.

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

OPERATION

If you are familiar with the Orban line, then the operation of the 8600 will not surprise you. I prefer working with the PC remote software to make changes, but the front panel display and user interface are intuitive. Because Orban maintains a consistent structure among its products, it does not take long to learn and to start tweaking the sound. The option to modify presets using the basic modify, intermediate modify, and advanced modify gives users starting points based on their levels of experience. Orban recommends making basic adjustments before moving to more advanced levels. Once the desired sound is achieved, use the front panel for minor changes.

For more advanced settings, especially via remote VPN, use the software application to connect. Anything you do on the front of the unit can be done via a network connection. Here, the GUI gives you more information at once, making changes quicker and easier. In addition, switching between presets for comparison is much more convenient. The convenience factor goes up if you manage more than one unit. An added benefit is using the software to save, backup and transfer presets between processors. In my case, I can create the preset for our main station and upload a copy of the preset to the simulcast station's processor, cutting the time it takes to tweak the sound. If running an 8600HD, the FM analog processing and digital (IBOC) processing can be performed independently. When the analog and digital are unlinked, a second set of processing adjustments becomes available for the digital channel.

PERFORMANCE

This processor is excellent and can be counted on to represent the source. Processing structure is very similar to the 8500, so it was easy to adapt to the 8600. Any changes are in the DSP – the 8600 uses a DSP board with about three times the processing power of the 8500's board. As chip designs and algorithms improve, we will always experience new and better sound, and that is evident in the first listening. The most notable change is in the peak limiter.

The MX Technology Peak Limiter aims to achieve clean, crisp audio using a multi-stage approach. The first stage mentioned in the manual is a pre-limiter to control low and high frequency peaks prior to the main peak limiter, which is the next stage. The main peak limiter uses a psychoacoustic masking model to help prevent clipping distortion from becoming audible.

All new presets with MX in their names use the new limiter. The non-MX presets are the same as those found in the 8500 and were primarily included because they have much lower delay than the MX presets. This may be required if live talent is relying on an off-air feed to drive headphones during remote broadcasts. The non-MX presets also provide a nice base for comparison purposes. Another way to determine which presets use the MX limiter is to navigate to the distortion tab, where a different set of controls appear.

LISTENING TESTS

I performed a number of listening tests using the Gregg and the Gregg_MX presets along with my own custom preset pair. There is a noticeable audible difference between the presets. The energy in the high end is subtle, but the clarity is improved. This effect is more pronounced if more aggressive settings are used, though the tradeoff between distortion and clarity also increases. My first test was to push the multiband clipping harder in the MX. I usually run this conservatively at 0dB to 1dB. When using an MX preset, I was surprised that I was able to push 3dB and maintain acceptable sound quality; while in the non-MX presets, the word grunge comes to mind. Be aware than other settings (mostly individual band compressor thresholds) change between MX and non-MX factory presets because Orban's programmers tried to keep the mid-frequency and low-frequency balances consistent between similarly named MX and non-MX presets while still exploiting the MX limiter's ability to achieve 2 to 3dB more high frequency energy than the 8500-style limiter. I learned this with a custom setting to push the bass. Without making any other difference to the compressors, I changed the equalizer settings, boosting the bass to the maximum of 12dB in the LF Shelf and 10dB in the low band centered around 266Hz. Changing the pre-limiting and bass-limiting settings, I was able to hear the gain reduction of the low end and how the distortion products changed. Surprisingly the distortion was not as unacceptable as one would expect. The high end maintained clarity much better than the predecessors. As for the non-MX presets, do not try this at home.

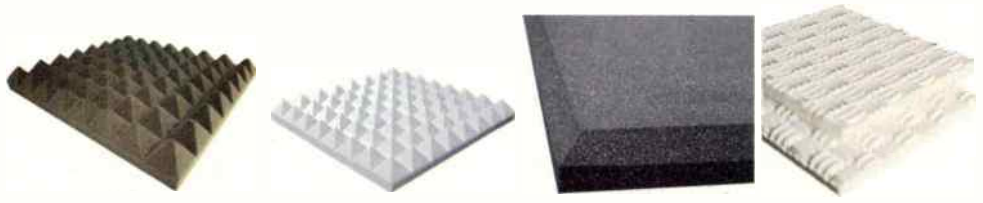
There is one operation that I was unable to perform and test. Orban provides a compatible single sideband operation for their composite feed. Others have written on this subject and I am unable to test it with our setup. It is a compelling excuse to move our equipment to the transmitter site, but space limitations at the sites and IBOC operation preclude our doing that.

I cannot go through an evaluation without commenting on the documentation. In the case of Orban, it is a nice addition. All documentation is provided in PDF format. Both a godsend and a curse, PDF is nice in that it is searchable. The bookmarks all link to appropriate sections. The extra work necessary is to link the index, especially with the section-page number format that is used. The best part of the documentation is the detail. It is worth the time to browse, read, and absorb the content, especially the section titled Introduction to Processing.

The move toward higher quality audio on FM is nice to see. The new Orban 8600 is on the right path to providing this quality. We will continue to see and hear improvements as technology improves. I look forward to what manufacturers will do next.

Eisenhamer is chief engineer of Lincoln Financial Media Co. of California.

Acoustic Wall Panels



When it comes to controlling unwanted sound in a studio, there are two basic solutions: absorption and diffusion. Absorbing materials attempt to eliminate sound reflections and standing waves. Diffusors reduce the intensity of sound by scattering it over an expanded area. Absorbers are more commonly used in radio facilities since the goal is to eliminate the reflections.

In radio, the foam design is most commonly used, but cloth-covered panels run a close second. Both are available in a variety of thicknesses, which affects the frequency range of the absorption. Foam panels are usually glued to a wall surface, while cloth-covered panels can be glued or hung like a picture.

Typical materials are open cell polyurethane foam, cellular melamine, fiberglass, fluffy fabrics and other porous materials. In the last few years, fire-retardant and fire-proof materials have gained in popularity.

	Acoustical Solutions AlphaPyramid AAP2LG	Acoustics First Fire-Flex Pyramid AFPX2	Auralex Acoustics StudioFoam Pro	Pinta Acoustic Sonex Junior
MSRP	$373 (1-9 boxes) (quantity discounts)	$423 (1-9 boxes) (quantity discounts)	$302.50	$79
Composition	Foam	Open-cell melamine foam	Melamine-free foam	Open-cell melamine-based foam
Certification	-	-	-	LEED
Fire Rating	Class 1	Class 1	Class 1	Class 1
Thickness	2"	2"	1.5"	2"
Size	2'×2'	2'×2'	2'×2'	2'×2'
Appearance	Seamless pyramid design	Seamless pyramid design	Beveled edge	Anechoic wedge shape
Noise Reduction Coefficient (NRC)	0.70	0.80	.90	0.75
Installation	Water-based panel adhesive	Adhesive	Auralex TubeTak or FoamTak adhesive, finishing nails or adhered to substrate with finishing nails	acouSTIC adhesive
Finish Options	Light gray. Polyurethane colors: beige, brown, charcoal, blue	Light gray, other colors available	Charcoal	Natural white, gray or colortec
Density	2 lbs. per cubic foot	0.7 lbs. per cubic foot	Proprietary	0.5 to 0.7 lbs. per cubic foot
Tensile Strength	20 psi	8 psi	Proprietary	8 psi
Additional Options	AAP3LG (3" thick, NRC 1), AAP4LG (4" thick, NRC 1.05)	AFPX3 (3" thick, NRC 1.00) , AFPX4 (4" thick, NRC 1.05)	2'×4' (1.5" thick, NRC .90)	Sonex Classic (2" thick, 2'×4', NRC 0.80)
Other Models	AlphaLinear, AlphaWedge, AlphaPyramid polyurethane, AlphaWedge polyurethane	Wedge, Max Wedge, Wedge Ceiling Baffle	Elite ProPanels (Fiberglass)	Pyramid, Clean, Valueline, Mini, One
Number of sheets in box	18 (72 sq. ft.)	18 (72 sq. ft.)	10 (40 sq. ft.)	4 (16 sq. ft.)
URL	acousticalsolutions.com	acousticsfirst.com	auralex.com	pinta-acoustic.com

COMING UP NEXT In January we'll coÜare the exciting, on-the-go features of coÜact and portable mixers. Stay tuned!

In the toughest competitive environment ever, a winning strategy includes OPTIMOD-FM 8600.

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www.orban.com

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NEWPRODUCTS

Sonifex | Stereo distribution amp

RB-DA6R, RB-DA6RG: This six-way stereo distribution amplifier is a 1RU high-performance amplifier for splitting a source into a number of different outputs. The amplifier provides multiple balanced audio outputs using RJ-45 connectors wired to the StudioHub+ standard. By using RJ-45 outputs, it allows simpler CAT-5 cabling to connect the amplifier to other products.

It has one stereo input switchable via a rear panel push switch between paralleled balanced inputs and unbalanced inputs. The unit has six stereo outputs on six RJ-45 connectors. The unit can also be configured so one mono input can be distributed to 12 outputs by use of a switch recessed on the front panel to prevent being accidentally knocked. The RB-DA6RG is identical to the RB-DA6R with the addition of individual output gain adjustment, instead of global stereo gain adjustment.

www.sonifex.co.uk

Liquid Compass | Streaming platform

LC Pro 2.0: The LC Pro 2.0 streaming radio platform includes features for listeners, station managers and program directors previously unavailable for streaming radio. A new social networking element allows users to rate songs and share music, radio stations, etc., with their entire social network. A "favorites" feature enables listeners to flag their favorite songs, purchase them immediately through iTunes or save for purchasing at a later date. LC Pro 2.0 includes access to artist biographies, upcoming tour dates, song lyrics, track history, and rewind, pause and fast-forward functions. A "talkback" feature allows users to give immediate feedback about the track or the program. Notifications will also be included with LC Pro 2.0 that alert users of breaking news, severe weather, national and state alerts, as well as product giveaways and other time-sensitive information. LC Pro 2.0 will allow listeners to seamlessly integrate programming into almost any audio system or sync to Internet devices like Apple TV, mobile devices and automobiles. Benefits for stations include the capture of statistical data on how people are using the player, what is being clicked on, demographic data, song ratings and social network data, such as followers (Twitter) and likes (Facebook). Program directors can get immediate feedback from listeners as a marketing tool to determine what is currently trending.

www.liquidcompass.net

Rode | Tube microphone

Classic II Limited Edition: This custom edition of Rode's Classic II is exclusively limited to an edition of 500 worldwide. The release of this microphone coincides with Rode's decision to retire the Classic lineage, following a celebrated 15 years as the Australian microphone manufacturer'sflagship model. For the first time the Rode Classic is finished in matte black, with the "15 Years of Classic Sound" logo etched onto the microphone's brass body. A second of the rare 6072 twin triode tubes is supplied in a custom made, etched aluminum storage cylinder to ensure that this microphone's classic sound will last for many years to come. A leather-bound embossed collector's coffee table book documents the history of Rode's flagship microphone.

www.rodemic.com

JK Audio | Telephone hybrid remote interface

RIU-IP Update: The re-introduction of this interface features a complete redesign of the Web server, supporting innkeeper 1-, 2-, and 4-line digital hybrids. The Web server allows the user to send and receive control data through a Web browser. Remote control capabilities include: indication of incoming ring per line; take phone line off-hook or on-hook; indication of off-hook on on-hook status per line; DTMF dialing with Flashhook; set auto-answer and ring count; start and stop conference (innkeeper 2); adjust transmit and receive level per line (innkeeper 2 and 4); master send configuration (innkeeper 2 and 4); call hold (innkeeper 2 and 4); test tone start/stop per line; and no external power required.

www.jkaudio.com

Society of Broadcast Engineers | Online course

The New Lifecycle of Media: "The New Lifecycle of Media - IP and File Based Architecture and Workflows" by Gary Olson reviews the entire IP and file-based architecture, the changes in workflows and the broad spectrum of technologies that make up the environment. Gary Olson is a media technology and business advisor specializing in the transition of traditional media workflows and business processes. The course covers all the technical considerations that need to be taken into account in a file-based architecture, the changing roles and responsibilities engineers will have in designing and maintaining these new systems, new jobs or roles that are necessary in handling media in this architecture, and the changes in workflow and business processes.

www.sbe.org

UPGRADES AND UPDATES

Wheatstone has released a white paper to explains processing for engineers and programmers. Topics offer basic tips for more successful processing, advice on deploying processors, and specific elements processing pros look for to identify clean sound. (www.wheatstone.com) ... **Studer** has signed a deal with **Axia** to support the Livewire AoIP system. (www.axiaaudio.com, www.studer.ch) ... **Digital JukeBox** has appointed Ron Paley Broadcast as business consultants to run the day-to-day operation of the software developer. (www.digitaljukebox.com, www.ronpaleybroadcast.com) ■

Which is better for streaming: hardware or software?

Telos ProSTREAM:
Internet streaming in a box.

Everyone knows the answer is *hardware* — like a Zephyr! Introducing Telos ProSTREAM, the professional netcoder for Internet streaming, with Omnia multi-band processing built right in.

ProSTREAM makes sending programming to the Net easier than ever. Simple and bulletproof: analog or digital audio goes in, compressed audio streams out. Just hook up your input, select a bit rate and Omnia processing preset, send the output to your Shoutcast or Wowza server, and *Shazam!* Streaming audio, simple as 1, 2, 3.

And such audio…amazing. Thanks to our partnership with Fraunhofer (FhG), we were able to build a processing architecture that's specially optimized for MP3 and MPEG-AAC encoding algorithms. The result: detailed, commanding, blow-you-out-of-your-office-chair streaming audio, even at aggressive bit rates.

Telos

Telos-Systems.com/ProStream/

Omnia A/XE:
Internet streaming in a server.

Obviously, the correct answer is *software*, with the power to stream multiple channels from a single PC. Meet Omnia A/XE, the professional all-in-one software solution for Internet streaming.

Omnia A/XE can turn a couple of lonely servers into a supercharged streaming network. It runs in the background as a Windows service and can process and encode multiple streams in various formats simultaneously. Just hook up your audio, choose a bit rate and processing preset, select your Shoutcast or Wowza server, and *Voila!* Streaming audio, simple as A, B, C.

And that audio packs the clean, clear competition-crushing punch Omnia is famous for. Each stream is sweetened with its own adjustable wide-band AGC with three-band compressor/limiter, EQ and low pass filter, and precision look-ahead final limiter. The result: clean, clear streams with more presence and character than you ever thought possible.

Omnia

OmniaAudio.com/AXE/

NEW PRODUCTS

International Tower Lighting (ITL) | Dual LED lighting system

ILS-D1RW-008-E1: This system utilizes LED technology for both red night and white day lighting. This complete E1 system consists of a dual LED flash head, power supply, interconnecting cables, photocell kit and side light kit. Features include:single enclosure design for ease of installation; GPS flash synchronization requires only the addition of a GPS antenna; non-latching alarm contacts prevent nuisance site visits; alarm contacts (form-C) provided for day/night mode; DIP switch selectable for red/white or white/white; support for all popular models of LED side lights; failure of photocell to transition results in default to day mode operation; manual mode override switch; indicator LEDs provide for red and white alarms, PEC alarm, side light alarm, operating mode and GPS functions; and E2 type systems are available.
www.itl-llc.com

OMNIA.11 EVERYTHING YOU HEAR IS TRUE.

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- Louder yes, yet always pure & uncompromised
- Pop sparkles
- Rock really rocks
- Country caresses
- Hip hop thunders
- Voice is natural and intimate
- Push it hard and be amazed at how open and clean it remains

Find out more: www.omniaaudio.com

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A TELOS ALLIANCE COMPANY

Radio never sleeps. Neither do we. We're here for you, anytime, with free round-the-clock, 24/7 technical support. Call +1-216-622-0247

Axia Audio | Hardware-based routing switch control

Pathfinder Core Pro: Delivering the power of PathfinderPro, and more, in a dedicated hardware appliance with no Windows server required, Pathfinder Core Pro is programmed using an intuitive graphical software interface. It is fast, efficient, and simple to use: just attach to a network, give it an IP address, and it automatically builds a detailed Axia/GPIO router table. Pathfinder Core Pro adds new capabilities such as automatic configuration backup, improved clustering support for more than two servers, multi-site clusters, local clustering auto-discovery, and powerful Core Events tools.
www.axiaaudio.com

NewTek | Portable live production

TriCaster 450/450 Extreme: The latest addition to the TriCaster line of portable live production systems, the TriCaster 450 series makes HD production available to more live video producers than ever, in an even more compact, cost-effective solution. TriCaster 450 Extreme offers additional innovative benefits, such as NewTek's IsoCorder multi-track, multi-format video recording technology. With TriCaster, anyone can simultaneously produce, live stream, broadcast, project and record HD and SD network-style productions. A single operator or small team can switch between multiple cameras, virtual inputs and live virtual sets, while inserting clips, titles and motion graphics with multi-channel effects.
www.newtek.com

DM Engineering | EAS remote control

Ultimate Jr.: The Ultimate Jr. EAS remote control and automation Interface is for the Sage-Endec SE1822 and 3644 digital EAS encoder/decoder. A large backlit LCD scrolling display shows date, time and alert details. An attention getting strobe catches the user's eye when an alert is pending or has been sent, and the color is tailored to the serverity of the alert. Ultimate Jr. has a small footprint: mount it on the console or stick it up on the wall or studio window. Connect via single CAT-5; no power input required at this end. Dedicated pushbuttons initiate RWT, relay pending alert or RMT, kill pending alert, clear strobe and clear sign. An automation interface allows contact closures from the user's automation or any normally open contact or switch to initiate an RWT.
www.dmengineering.com

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Free 2011 Catalog from Telos, Omnia and Axia.

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NEWPRODUCTS

NCH Software | Audio editor

WavePad v5.0: The interface for WavePad now features a ribbon toolbar that categorizes editing, effects, and tools on their own selectable toolbars. Its feature set includes recording, editing, and effects such as amplify, normalize, reverb, echo, and reverse and is extended by DirectX effects and VST plugin support, and an included royalty-free sound effect library. The new ribbon toolbar organizes all these aspects of the program. The newest version also includes a wah-wah effect, vibrato effect, tremolo effect, doppler effect, and pitch speed profile tool.
www.nch.com.au

AudioScience | Networked audio interfaces

Connect CobraNet Mini: These products are for smaller quantity input and output requirements. The Connect 4.4M (and 2.2M) receives four (or two) channels of CobraNet and sends them to their balanced analog audio outputs, while simultaneously inputting four (or two) channels of mic/line level balanced audio and transmitting them as CobraNet. The Connect 4.4D (and 2.2D) receives four (or two) channels of CobraNet and sends them to their AES/EBU audio outputs while simultaneously inputting four (or two) channels of AES/EBU audio and transmitting them as CobraNet.
www.audioscience.com

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Sandies	44	215-547-2570	www.sandiesusa.com
Satellite Center	44	504-915-8244	www.satctr.com
SCMS	21	800-438-6040	www.scmsinc.com
Shively Labs	11, 46	888-744-8359	www.shively.com
Sony Creative Software	7	800-577-6642	www.sonycreativesoftware.com
Telos	39, 41, 43	216-241-7225	www.telos-systems.com
The Studio Hawk	47	662-324-2769	www.thestudiohawk.com
TieLine Technology	5	317-845-8000	www.tieline.com
Transcom Corp.	49	800-441-8454	www.fmamtv.com
Translantech	28	212-222-0330	www.translantech.com
V-Soft Communications	47	800-743-3684	www.v-soft.com
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MORE ONLINE For a link to the entire Alan Burns & Associates report, visit RadioMagOnline.com.

Women's Radio Usage

by Erin Shipps, senior associate editor

How Women Use Media

	Rarely/Never	Monthly	Weekly	Daily	Daily TSL
Watch TV on TV	4%	2%	9%	85%	4:30
Listen to radio on radio	3%	3%	15%	80%	2:00
Check Facebook	15%	6%	12%	68%	1:45
Listen to stored music files	20%	10%	23%	47%	1:15
Watch videos online	18%	20%	31%	31%	:45
Non-Radio music streams	40%	20%	19%	20%	:30
AM/FM online	46%	20%	16%	18%	:30
Radio station website	46%	27%	17%	10%	:15
Radio station Facebook page	66%	16%	10%	8%	:15
AM/FM on phone	77%	8%	8%	7%	:15
Radio (on radio, online, phone)					2:45

30.6%
Respondents who were listening to radio more in the last year because they said "radio gets me."

85.6%
Respondents who had radios in their car.

69.6%
34.1%
12.8%
TV 3%
HD Radio 2.7%
2.4%

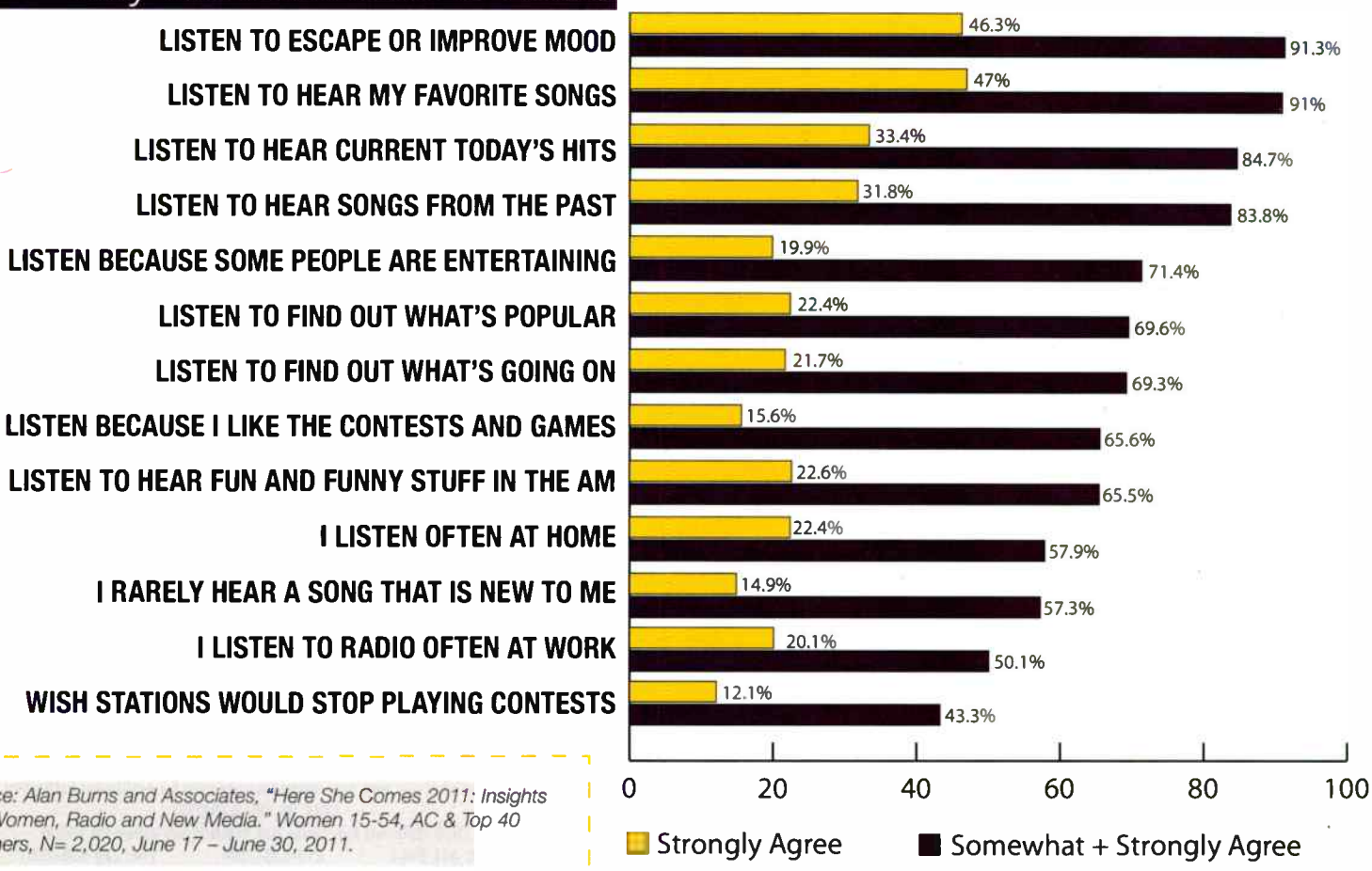
92.2%
Respondents who own a cell phone.

79.2% laptop
55.3% iPod
12.8% satellite radio (car)
8.1% iPad

Media Familiarity

Streaming Platform	Knows About	Uses
YouTube	71%	92.5%
Pandora	50%	77.6%
Rhapsody	20.6%	73.5%
AOL Music	18.2%	54.5%
HD Radio	4.5%	31.4%
Playlist.com	10.7%	28%
iHeartRadio	8.9%	25.7%

Why Women Listen to Radio



Source: Alan Burns and Associates, "Here She Comes 2011: Insights into Women, Radio and New Media." Women 15-54, AC & Top 40 Listeners, N= 2,020, June 17 – June 30, 2011.

ARRAKIS SYSTEMS INC.

MARC-15-15
on sale $6,499

15 channel modular console
supports two phone hybrids
USB sound card modules
control room & studio

ARC-8
only $799

2 mic, 4 stereo line,
PC USB , and Phone input
both balanced & unbalanced IO

XTREME
automation
only $100
per month

Live On Air,
Hard disk & Satellite,
16 stereo input switcher
with logic

ARC-10
three models

ARC-15
only $3,495

1-5 mic inputs,
PC USB , and Phone inputs
both balanced & unbalanced IO

ARC-10U: $1,599 unbalanced
ARC-10UP: $1,999 unbal w USB
ARC-15: $2,495 balanced w USB

2 mic inputs,
PC USB , and Phone inputs.
both balanced & unbalanced
models.

'ACCENT'
studio furniture

all ARC consoles
(except ARC-10U) feature built in
PC USB sound cards and come with
'Xtreme -Studios' live on air software

'Pre-End of the World Sale'
the Mayan calendar predicts the end of
the world in 2012... so Accent Furniture
is 25% off until Dec 31st, 2011

ACCENT is a contemporary blend of brushed metals, pleasing colors, and interesting textures. The metal structure is artfully integrated into the visible design decor of the cabinetry. Cabinetry and electronic equipment complement each other to create a bold visual environment for talent, guests, and clients alike.

www.arrakis-systems.com

all prices are many

CLEANUP
YOUR ON-AIR SOUND & IN THE RATINGS

AirAura's **31-Band Limiter** Delivers FAR More Clean Sound Detail than ANY Other Limiter on the Market. Here's Why This Is Important...

In a traditional processor with 5-band limiting, selecting 3 bands results in 60% of the audio being affected. It's clear to see how such a coarse adjustment can adversely affect the overall audio.

In the AirAura, with 31-band limiting, only the narrow bands that need limiting are affected (just 9.5% of the audio spectrum). This allows MUCH more natural sound and the ability to tune-in your audio with near surgical precision.

In a side-by-side listening comparison, you'll hear that this difference is HUGE. 31-Band Limiting is also relevant because it's a natural division – each band represents one third-octave of the audio spectrum. This makes processing more natural and more musical.

AirAura has a lot of other tricks up its sleeve, all of which reduce or refine the amount of processing to reduce distortion, artifacts and overblown sound. All we ask is that you listen...we know you'll be blown away.

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