



IP AUDIO FOR TV PRODUCTION AND BEYOND

WHAT YOU NEED TO KNOW ABOUT
MANAGING MORE CHANNELS, MORE MIXES
AND MORE REMOTE VENUES

It's been said, in the context of television broadcasting, that "audio is tougher than video."

Anyone who has ever worked in that fast-paced, high-pressure environment can readily explain why that's true. Audio, as compared to video, requires a very different set of processing, routing, and mixing tools. There are also more sources to process, route, and mix.

With anywhere from two to eight or more audio sources associated with a single video feed, managing all that data requires considerable processing and mixing power and intuitive controls to keep the audio operator ahead of the game.

Why AoIP?

New challenges in the industry have also demanded more from TV audio technology.

As in most industries, economic pressures are creating an environment where the same amount of work must be done, but in less space, with less costly hardware, and with a smaller staff.

There are more channels and more mixing being done today. Control rooms are more automated than ever before, and require audio hardware that is automation-ready.

IP audio networking offers answers to many of these demands and more. ●



9 Things IP Audio Brings to Television

The shift to IP for television is something Wheatstone has been working on for years. Our Bridge system, with many still in operation, is the foundation that's allowed networked audio to keep pace with advances in video technology. It has also become the blueprint for network scaling and functionality in modern AoIP systems regardless of brand.

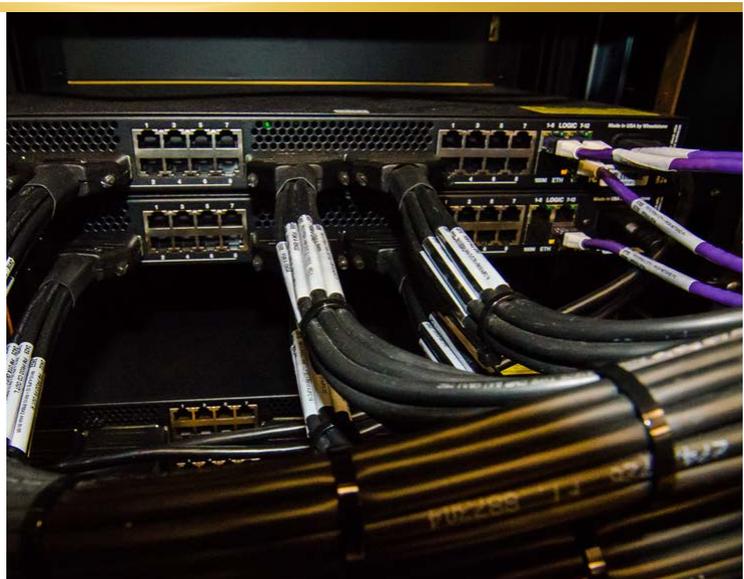
With WheatNet-IP, we've taken what we've learned about networked audio and built the most advanced IP audio network ecosystem available for broadcast. Our evolved IP audio works seamlessly with modern standards such as SMPTE 2110, ATSC 3.0, and more in the works.

Engaging the AES67 standard we helped author in conjunction with other AES task force members, we provide a system that not only routes, but gives you the tools you need to manage and manipulate your audio in any way you'll need for your specific applications. This is all built into each and every BLADE interface on the network.

Thousands of mature Wheatstone IP Audio networked systems are already deployed in radio and TV studios around the world. We're ready to provide you with everything you need to be at the top of your game when it comes to IP audio for television. We're bullet-proof, lightning fast, and we've got the installations to prove it.

1. Intelligent Distributed Routing

WheatNet-IP utilizes AoIP to distribute audio intelligently to devices across scalable networks, enabling all sources to be available to, and controlled from, any and all devices. WheatNet-IP is AES67 compatible, yet is unique in that it represents an entire decentralized end-to-end solution, complete with audio transport, full control, and a toolset to enable exceptionally intelligent deployment and operation. It handles all audio formats - HD/SDI, AES, MADi, AoIP, and Analog - to provide completely seamless operation in your broadcast/production chain. ➔





2. Advanced Control Hardware

Wheatstone's control surfaces provide complete mixing tools for interacting with our WheatNet-IP Intelligent Network and are distinguished from smallest to largest only by the size and scope of your needs. All are designed expressly for use with the working preferences of TV audio professionals. Our Series Two is our most modest, with a tiny footprint and controls suited to live and automated TV. Our IP-64 is our largest and offers our most advanced feature set. All embrace current standards, such as SMPTE 2110 and AES67, and are open ended to incorporate any future standards.

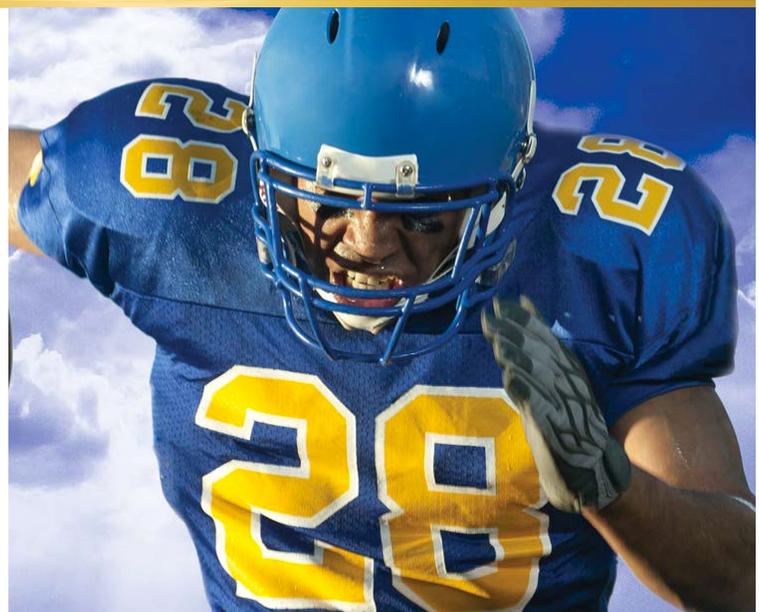


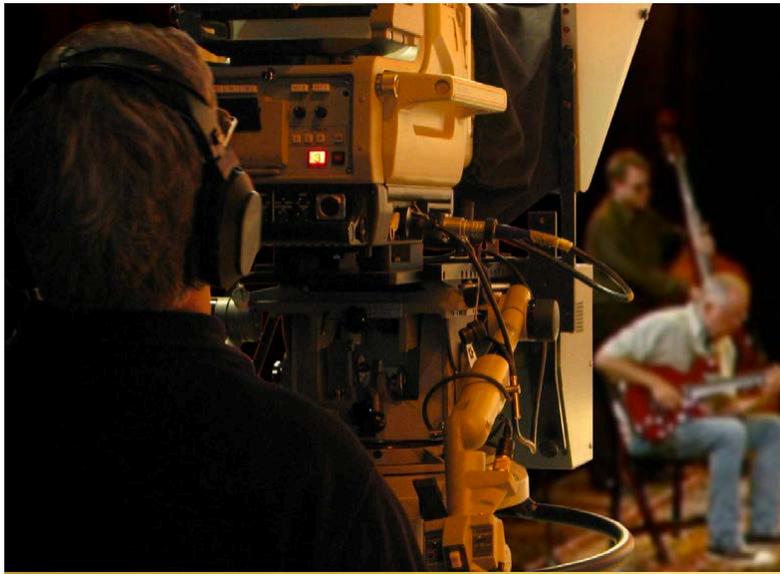
3. Automation Control Interface

Grass Valley Ignite. Ross Overdrive. Sony ELC. Mosart – all are systems that allow for automated production of live news. Wheatstone's Automation Control Interface works with all of those, and many more, to allow audio to function in a console-free environment. For this automated programming, we offer a VMI (Virtual Mixing Interface) along with GLASS-E, a virtual control surface that allows remote control when necessary, via the internet. With Wheatstone, audio can follow or call the shots as you decide.

4. Long & Short Haul Sports Coverage

Whether you're covering a story across town, or handling audio for a Sunday game from 3000 miles away, Wheatstone has the WAN solution you need. At-Home, or REMI (remote-integration model) applications have been growing as alternatives to full broadcast production vans for covering sports. Smart BLADE-3 interfaces can deploy dozens of audio services, as well as provide multiple control and automation capabilities including latency-free venue-side IFB. And they interface seamlessly with systems from Artel and others to carry audio and video from venue to production. →



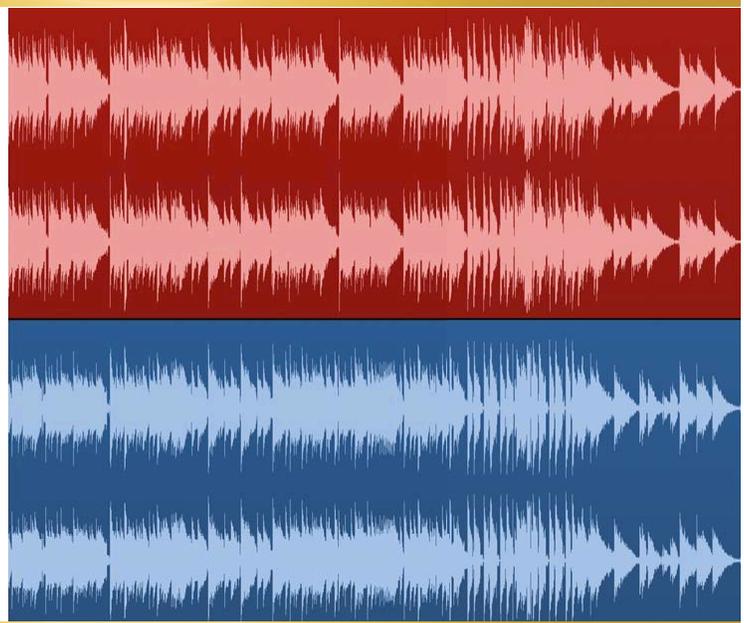


5. IFB & More Built In

Native to every BLADE interface is the means to create a completely decentralized IFB system with no 3rd party hardware. The speed of our network means there is virtually no latency when using the intercom functions, so real-time audio is a reality. Taking it further, these same tools create a virtually unlimited number of mix minuses, mic muting, and more essential audio-for-TV features.

6. Flexibility & Format Interoperation

WheatNet-IP is a complete end-to-end audio ecosystem and as such can handle most of your audio needs comfortably. It's also capable of being format agnostic and can easily handle audio format conversion on the fly. Interfacing with different networking systems happens seamlessly in realtime. Audio formats such as HD/SDI, AES, MADI, AoIP, and Analog, or different protocols, such as Dante, Ravenna, Livewire, etc., are accommodated through AES67, which is part of the SMPTE 2110-30 Media-over-IP standard.



7. Top End Performance

WheatNet-IP is unique in the network world in the way it handles traffic. No audio is passed or available on the network until it is requested. And when that request is closed, so is that audio channel. This dramatically reduces congestion and the possibility of packet collision/failure. Plus, it's the only network that operates at full Gigabit Ethernet rates, which means extremely low latency for realtime monitoring. →



8. Networkable Audio Processing

Built into every BLADE are stereo processors that can be deployed anywhere on the network. This provides a cost-effective solution to audio correction and/or sweetening for remote feeds, audio from different studios, call-ins, and more. Additionally, Wheatstone's M-1, M-2, and M4-IP mic processors have become absolute standards in the broadcast industry.



9. Software for True Customization

Engineers never cease to amaze us with their ingenuity, so to that end, we develop our hardware and software to encourage exploration and customization. ScreenBuilder is a very powerful software platform that allows you to create just about any on-screen control environment you can imagine. Think of it as a control construction kit that lets you put your most inventive ideas to work. IP Meters gives you the ability to create screens with banks of meters for viewing anywhere in your facility. And Navigator provides a system overview that lets you set up your workflows and create macros or salvos that can facilitate complete changeups with the push of a button.

A Rack's Worth of Tools Helps... Virtually, Of Course

A network needs more than basic routing. It needs optimal control and integrated tools to get the most out of it. We know this from years of building networks and working with broadcast facilities to deliver their vision of how their work needs to flow. So, we build an entire rack's worth of tools into every BLADE interface we make. Mixers, processors, logic tools, routing tools, and tools that defy description. If you can think it, you can make it happen with WheatNet-IP. ●



FIVE THINGS TO THINK ABOUT WHEN TRANSITIONING TO IP



Your IP audio network will determine how much your studio can or can't do, now and in the future. It's important to get the right one for your needs. Here are five things to think about:

Think beyond access. Think control.

IP connectivity isn't just about access. It's about control. The more functionality you can put on the network, the more control you'll have over change. For example, WheatNet-IP has an integrated control layer that carries all the logic functions for audio. This makes a world of difference when it comes to being able to handle the unexpected or to repurpose a news set for multiple productions. Control is built into each WheatNet-IP connection point that is shared with other IP connection points across the network, giving you access to not only all sources at once, but also the presets and any associated logic that go along with each feed for controlling such things as mic ON/OFF, automation START/STOP, or changing remote mic settings for gain, IFB routing, processing and other parameters.

Think distributed network intelligence.

Centralized network management is a single-point failure waiting to happen. Distributing network intelligence throughout to every IP point in the network is the smarter approach, because distributed networks like WheatNet-IP automatically build in redundancy. If one part of the network fails for any reason, the rest can keep on functioning. Each IP connection point – or BLADE – stores the entire configuration of the network onboard, which means that failover is immediate. And because WheatNet-IP BLADEs talk to each other, adding onto the network is plug-and-play for easy system expansion -- which in turn adds more control resources, audio mixing and processing tools, and more intelligence for whatever new services come along.

Think routable tools.

Having the right tools for the job is important. That's why we place audio tools at all IP connection points in the WheatNet-IP audio network. For example, having two stereo 8x2 utility mixers at each point of I/O makes it practical to do online mixing of sounds, between feeds, virtually overdub and pan, you name it. We added audio processing to our I/O BLADEs as yet another routable tool in our audio toolkit. Adding new tools is possible because each of our I/O BLADEs has a CPU and DSP processing inside, which we can add to, change, and make to fit just about any scenario that's needed.

Think about what's going to be hanging off of that network.

In addition to console selection, pay attention to the devices and elements that make up the network environment. Will you need talent stations? Will you want to route processing and mix remotely? What about virtual tools? Will you want to add customized interfaces through apps such as ScreenBuilder or configure your own console using tools such as those available for our LXE? The devices and software that make up the network environment will determine how flexible and expandable your system will be in the long run.

Don't forget AES67.

Being able to check this box will make it possible to stream audio between networks as your plans for IP audio expand and grow. ●

REAL WORLD STUFF...



Countdown To The Big Game

Live remotes are what keep broadcasters up at night. But after nine years of extravagant remotes the week before the NFL's Big Game, Jim Hibbard of Pacific Mobile Recorders knows to expect the unexpected and is prepared like a Boy Scout! He's the audio engineer responsible for The Dan Patrick Show NFL remote every year. Any pops, clicks, or dropouts of any kind will be heard by some 1.2 million weekly sports fans tuning into The Dan Patrick Show during the week preceding the Big Game.

In just a few months, Jim Hibbard will be packing several hundred pounds of audio necessities onto pallets and

heading out to the remote site for some pre-game fun with all the guests that arrive that week in anticipation of the Big Game itself. It's never too early to start planning.

Jim will no doubt be dealing with all the usual issues: arranging IFB between producer/talent/director in three geographic locations, getting phone calls and bumper music from the show's studio in Connecticut to the talent at the remote site, and handing off audio to the show's syndicator, Premiere Radio Networks, as well as to its television producer, the DirecTV Audience Network. The show is also seen on the NBC Sports Network. ➔



But for the remote, cameras are switched in nearby production trucks that are rolled in for the occasion, and the video feed then is uplinked to Los Angeles and on to the rest of the world. Meanwhile, the main studio for the radio show is in Milford, with IP audio shuttled between the remote site and the Milford studio.

At the remote venue, the show is broadcast from a large set which serves as a makeshift studio complete

→ The week will likely hold a few surprises as well, starting with the many guests. The weeklong remote for The Dan Patrick Show includes any number and variety of high-profile guests, from actors Adam Sandler, Ryan Reynolds, Kevin Bacon and Jerry Seinfeld, to athletes Joe Montana, Dan Marino, Steph Curry and Emmitt Smith, plus coaches, sports commentators, and the NFL superstars themselves.

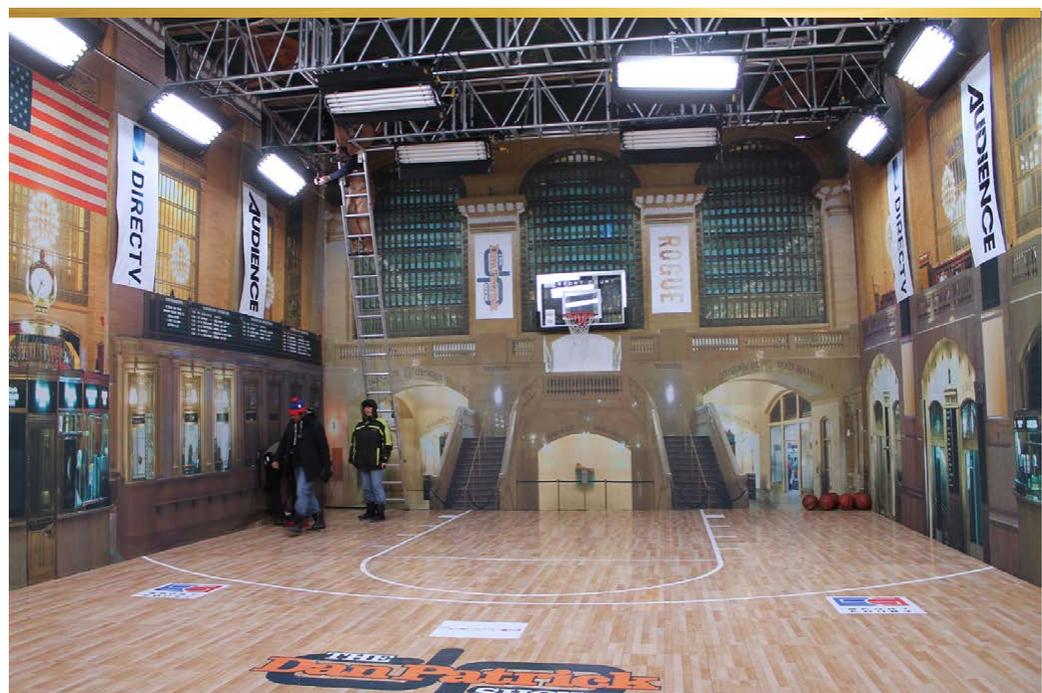
One thing's for sure: all the audio will be running through the WheatNet-IP audio network, as it has for the past nine years.

WheatNet-IP switches audio to and from a fiber link using Tieline Genie and Merlin codec units, joining together operations and directors, producers, talent and content for the syndicated radio show as well as television production in separate locations.

The studios are geographically dispersed. Typically, the multi-camera shoot is switched in Los Angeles, which is some 3,000 miles from the home studio in Milford, Connecticut.

with several WheatNet-IP TS-4 remote turrets and M4IP mic preamps and a fiber link to the backstage control area, at the center of which is an IP-networked 12 channel console, the Wheatstone E-1.

The studio setup for the 2018 game in Minneapolis remains to be seen. Each event provides unique challenges in terms of space and acoustics. One year, the remote was set in three large temporary buildings on an acre of land complete with a waterfall! Another year, the two-story set was built on the top of the parking lot at Pier 40 in lower Manhattan. That one included a half-size regulation basketball court on the second floor! →





➔ Hibbard also manages the remote audio for the Rich Eisen Radio Show during the week leading up to the Big Game.

Jim has his work cut out for him. But at least audio over IP across all studios and locations takes a few worries off his list. With all audio feeds and phone calls being fed by the home studio, there's no need to set up a separate number or additional phone lines at the remote site or to add equipment for audio feeds since all feeds come through the IP connection between the remote site and the Milford studio. IP audio networking via WheatNet-IP also serves as an intercom backbone for talkback IFB.

And those guests that pop in from time to time? Hibbard uses M4IP four channel mic processors for guests as well

as Dan and the Danettes! The M4IP has all the dynamics processing needed to smooth out any voice, but also has an Ethernet port so all controls for those mics – including turning them on/off – run across the network and can therefore work from the TS-4 talent stations and remote console.

Hibbard says: “Using a Wheatstone console with audio over IP system gives us the flexibility and routing functions to easily provide everyone involved in the show the same comforts and quality of the home studio!”

The Dan Patrick Show is produced by DirecTV Audience Networks for television viewing and syndicated on more than 250 affiliate stations by Premiere Radio Networks. ●

Q: Why do I need an IP audio network specifically for broadcast?

A: IP networks weren't originally intended for real time audio/video delivery. IP networks distribute packets in a non-deterministic manner, which can lead to dropped packets or noticeable jitter as the traffic increases on the network. IP audio networks made for broadcast purposes such as WheatNet-IP use QoS technology to assure seamless audio transport and to mitigate synchronization and audio quality issues. In short, unlike the enterprise IP network, these systems talk both IP and audio.

In addition, because they're broadcast-specific, IP audio networks are designed to accept audio from microphones, production automation systems and other sources as well as control and manage audio devices across the network. ●



When IP Isn't Enough...

If you've already started transitioning your broadcast plant and workflows to IP, you've no doubt discovered one of life's little ironies. IP, it turns out, knows very little about the successful delivery of media.

IP can bring unbelievable adaptability and extendability to audio for live remote production. But you'll still need a way to bring audio into the network, prioritize it to reduce packet dropouts and other quality issues, plus manage, process and do all those things you normally do with audio.

In short, you'll need something that talks both IP and audio, and knows AES67. That's where WheatNet-IP audio I/O BLADEs come in.

For example, the M4IP-USB BLADE is used at remote venues and in studios as an interface between the network and up to four microphones. It's essentially a four-channel mic processor with four XLR inputs and an Ethernet output port, with parametric EQ, de-esser and compressors for each channel – all of which can be set and adjusted from a laptop. The M4IP-USB also has two 8-channel utility mixers that you can assign to be a very low latency IFB subsystem and/or premixer with remote control capability in a network of other BLADEs. It includes built-in silence detection on all outputs with auto switchover and auto fall back for enhanced operational reliability, and USB ports for feeding audio directly from computers and other devices. And most importantly, as an I/O BLADE, it can route audio streams to anywhere in the network.

The M4IP-USB can be used as a standalone BLADE, or it can be part of a network of BLADEs to form a WheatNet-IP audio network. It can also be interfaced to just about any analog or digital mixer that takes AES or

analog audio, and as an AES67 compatible unit, it can be interfaced into any IP audio network that has AES67 (such as Dante®).

But what if you needed to bring in audio from a camera or other HD-SDI source? We have a BLADE for that, too. Our HD-SDI BLADE can feed audio from video production automation systems, routers, and other professional video equipment that use HD-SDI. It de-embeds multiple audio channels from HD-SDI streams so you can mix, process or simply route audio to your console for final broadcast. It is capable of de-embedding up to four HD-SDI streams, and up to eight audio channels per stream, and this BLADE also has all the standard built-in features like utility mixers and AES67 compatibility, so you can use it for IFB and interface it to all the same networks as our mic processor BLADE.

We also have a MADI BLADE for exchanging up to 64 bidirectional channels (AES10) of audio between our WheatNet-IP audio network and any MADI-compatible intercom system, TDM router, ProTools system or DAW. For TV folks, you can roll your production truck into a venue and plug the MADI BLADE into the house system for intercoms and mixing, and use its IP connectivity for backhauling to the main studio located elsewhere.

Wheatstone has 11 different flavors of BLADEs, any of which can be connected together into a WheatNet-IP audio network to provide resources and utilities for specific IP audio applications. ●



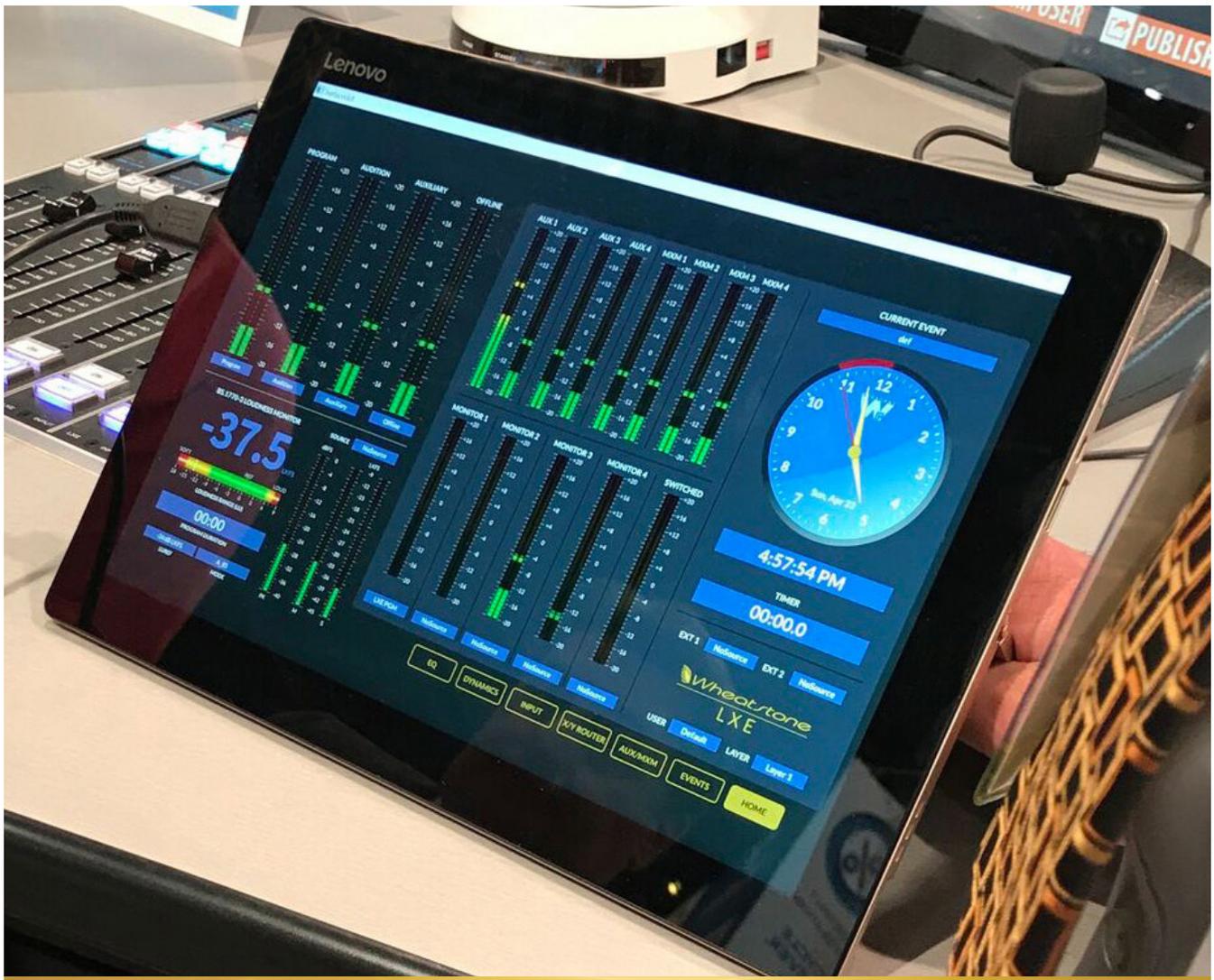
IP Onboard for Immersive, Personalized Audio

We've seen IP audio consoles get smaller, more adaptable, more capable, and, in truth, stranger looking. One console-like appliance that is recognizable to anyone familiar with WheatNet-IP audio networks is the SideBoard, a surface that contains faders and controls typical of a control surface but in a 4 RU rackmount chassis. Another interesting appliance is the TS-4 or TS-22 talent station, which is essentially a console all rolled into a small turret for putting mic controls, source selection, headphone volume and all the other necessary functions in front of talent.

We've just begun to scratch the surface of what IP audio networking can do.

We can now source, route, mix, and send to air from just about any surface imaginable, in some cases without touching a single physical fader.

We know of announcers broadcasting from a remote location using a touchscreen interface that is essentially a bank of faders, knobs and other software widgets on a flat screen monitor recessed into the furniture. Virtual surfaces like this are becoming more popular, thanks to the advent of apps such as Wheatstone's ScreenBuilder app that make it possible to create GUIs with the drag and drop of a widget on a screen, which can then be scripted for controlling devices and various elements in the IP audio network. ➔



➔ Not only can audio programming today function in a console-free environment, it can be more tightly routed and integrated with program automation systems, such as RCS Zetta, Enco, and BSI through IP.

In fact, much of what we've learned about software apps is directly transferable to hardware. IP audio consoles such as Wheatstone's configurable LXE are removing the limitations of a fixed surface by providing a completely reconfigurable architecture. Instead of mapping switches, buttons and knobs to a particular function that can never be changed, the LXE's surface controls are completely programmable – and continually re-programmable – through a GUI similar to ScreenBuilder. Any button anywhere on the surface can be programmed at any time for talkback, cue, start/stop or for toggling between functions, which can also be tied to different elements such as microphones.

In this new world of the expandable, adaptable and transformable broadcast console, there's also something else going on: a fresh, new way of interacting with audio. One of the more noticeable features of new consoles like the LXE are their intuitive GUIs, which make them not only the ultimate user interface between announcer and listener/viewer but also between announcer and audio as well. Being able to “pinch” the right amount of EQ or boost/cut frequencies using touch just scratch the surface of what these powerful platforms can do.

All of that is going to be more and more important as sound engineers add more channels to their workflows for immersive audio, as they add more control parameters to those audio mixes for the personalized sound experience, and as they continue to reach a wide audience with a myriad of playback requirements for cable, broadcast, web, even mobile. ●

REAL WORLD STUFF...



IP and the 80 Percent Rule

Senior audio mixer for the WCCB-TV morning show, Richard England, is shown here in front of the Dimension Three Touch audio console.

“Our philosophy is to operationally stay within the system box...doing 80% that works consistently and reliably on a daily basis rather than 100% that doesn't.”

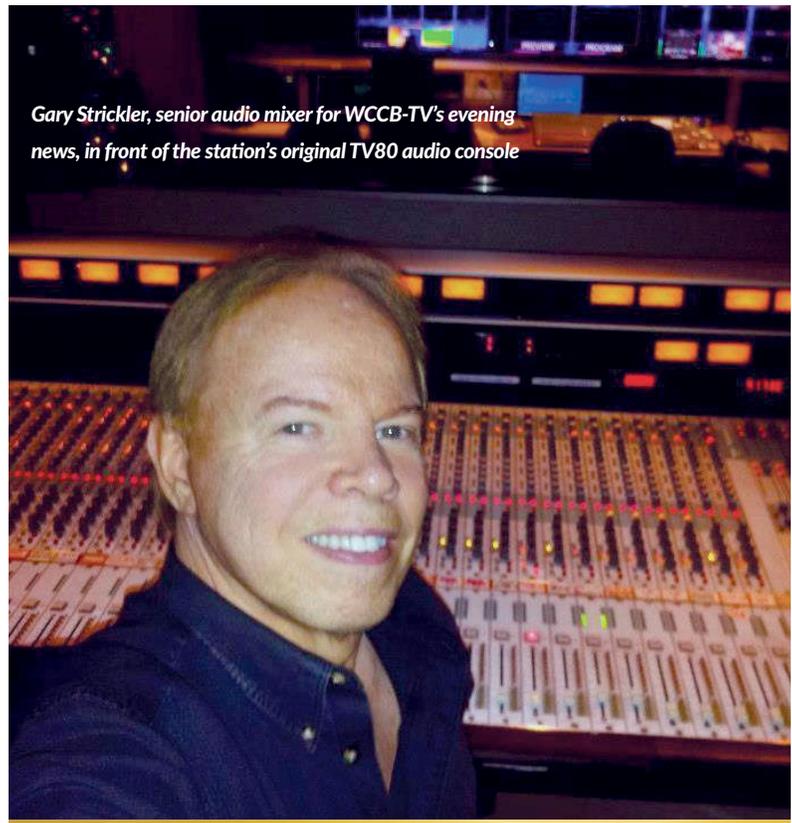
Those are the words of Bob Davis, Director of Engineering and Operations for regional broadcaster Bahakel Communications, headquartered in Charlotte, NC, and they make good sense to any broadcaster who wants to move into IP workflows without making a mess of things.

As he explains, “Providing a solid and stable system design for our production and operations teams while keeping them within well-defined parameters is the key to our success in the world of IP video and audio.”

Bahakel has been perfecting the 80 percent mindset for two years, during which time the group has linked up three of its six stations over IP for live, daily production.

From its WCCB-TV studio in Charlotte, the group produces WOLO-TV's newscasts from nearby Columbia, South Carolina. All studio cameras, mics, IFB, prompter, weather system, and set monitors in the downtown Columbia newsroom are linked to Charlotte by IP. In Charlotte, it all goes through production and master control, and is then re-encoded with all the sub-channels and sent back to Columbia via IP transport for transmission.

The same setup is used for some programming for WFXB-TV in Myrtle Beach. Mid-day weather is presented from the Columbia newsroom, through WCCB-TV production, and fed back via IP to WFXB-TV for air. News and weather content can be originated from any of the three locations for all three stations, as was the case during Hurricane Matthew. ➔



Gary Strickler, senior audio mixer for WCCB-TV's evening news, in front of the station's original TV80 audio console

➔ Wheatstone's Dimension Three IP audio console handles the mixing, mic control and IFB for all three from the Charlotte studio, using WheatNet-IP audio network I/O BLADEs. The three studios are less than a few hundred miles from each other. For audio-video transport, Bahakel uses Adtec, Harmonic and Sencore equipment for the IP links. "Often syncing the audio and video is a problem, but for us it has not been. We make sure the A/V encoding is done properly, with close attention paid to stream parameters and system design for synchronization so there's no video and audio drift," explains Davis.

There is a slight delay due to H.264 HD 4:2:2 quality video encoding and transport, but Davis says this has been an anticipated part of production since the group began central-casting WOLO-TV from WCCB-TV over earlier DS3 circuits years ago.

The difference is that by going from DS3 circuits to a dedicated IP link, the group has cut transport costs in half – and without compromising reliability. When Hurricane Matthew came through the area last fall, Bahakel broadcast live on all three stations from all three stations, continuing to broadcast even during a mass evacuation in Myrtle Beach without losing IP connectivity. WFXB-TV's building was empty and dark, remotely operated from WCCB-TV during the storm.

"Everything we do is around the idea that it has to work reliably without daily intervention, and we prove the system beforehand so we know the operational limitations," explains Davis. As IT technology proves itself over time, the group then folds those new developments into its operation, making the best of current technology without getting

stuck with early adopter reliability issues. WCCB-TV started with a Wheatstone TV80 analog audio console in 1999, and then upgraded to the Dimension Three with touchscreen access in October of 2016. "We evaluated the console and saw that it could be connected via (IP audio network) BLADEs, and thought, 'let's see what else we can do with that,'" says Davis. "Wheatstone's service and support are superb, so we had confidence their IP products would meet our needs."

Recently, he expanded on the WheatNet-IP audio network with Wheatstone's EDGE and Aura8-IP BLADE for an eight-channel audio link over Ethernet IP. The group uses the system for transporting multiple Columbia radio stations' audio back to WOLO-TV's master control in Charlotte for Emergency Alert System (EAS) compliance.

"While we do push the envelope here, rather than going for the 100 percent that's problematic, we go for the 80 percent that works. That's working very well for us," sums up Davis.

Sounds like a good plan to us. ●

MIX FROM HOME

The days of schlepping tons of equipment around to various sporting venues are numbered, along with the associated travel and staffing issues, such as delayed flights, room cancellations, and all the rest that happen as a matter of routine during a remote broadcast.

Fiber optic and other high-speed communication links can now bring it all to your home studio where your production team can mix the game and get it out for broadcast almost as fast as it happens. No big anvil cases. No grumpy field engineers. Well, that last part isn't entirely true – but the cost savings of mixing remote games from home certainly is.

With mixing taking place at home in a single location, there are fewer boxes to buy and get banged up out in the field. You'll need microphones and cameras, of course. And, someone has to still go out and capture the action. But it's a smaller, more manageable operation, which is why sports broadcasters are moving to this workflow model.

Collegiate sports network IMG World, for example, has been using the at-home model for some time to bring live coverage to 2,200 radio affiliates. On any given Saturday, it transports live audio from 40-plus ballparks and fields to its centralized studio in Winston-Salem, NC, where it does all the final production using WheatNet-IP mixing consoles and audio networking ([read Sporting IP Audio](#)).

WheatNet-IP is an AES67 compatible IP audio network made up of I/O and specialty BLADEs combining audio mixing, routing, and controlling into one studio environment – whether in one location or in multiple locations. Specialty HD/SDI BLADEs, for example, retrieve SDI audio directly from the camera, de-embedding it and sending it home as discrete audio.

To set up a WAN between the home studio and the remote venue, systems such as Artel's InfinityLink IL6000 provide the media transport with WheatNet-IP audio networking units and Ethernet switches on each end to extend workflows across the WAN. The network itself can serve as an IFB backbone that is routable by simply triggering crosspoints in the network – with zero latency between talent and crew in the field.

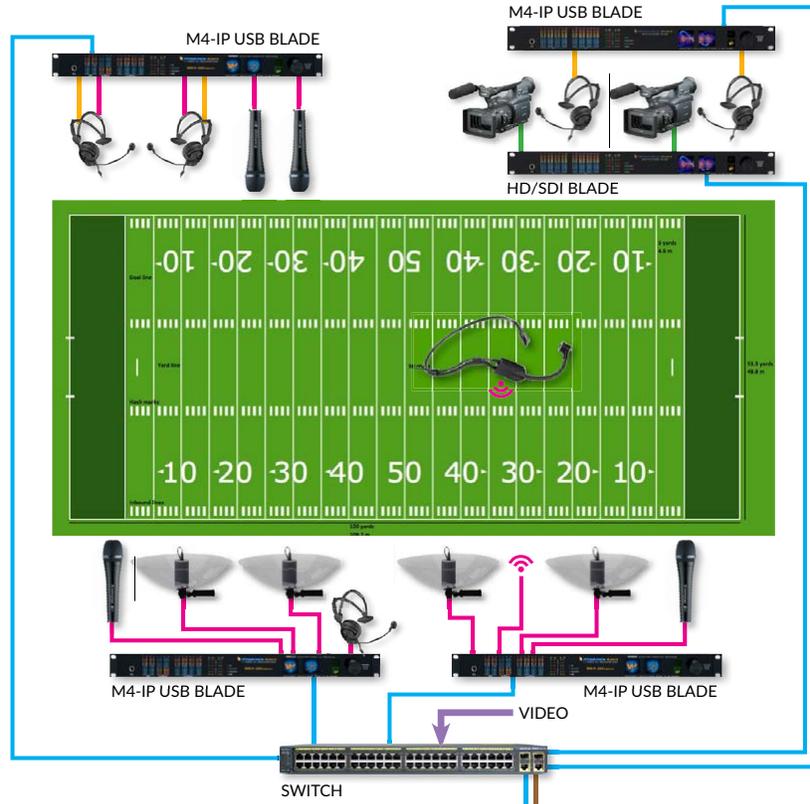
Meanwhile, at the home studio (or anywhere in the network) an IP audio control surface such as the Wheatstone IP-64, Dimension Three Touch, LXE or Series Four, can turn mics on, control levels, and trigger IFB remotely.

And because most IP audio networks are now AES67 compatible, WheatNet-IP included, it's a relatively small matter to transport audio from, say, a live sound group that might have one network platform (such as a WheatNet-IP system) and a broadcast truck that has another (such as Dante).

You can read more about the at-home workflow and how we set up a IP audio WAN in just a few hours.

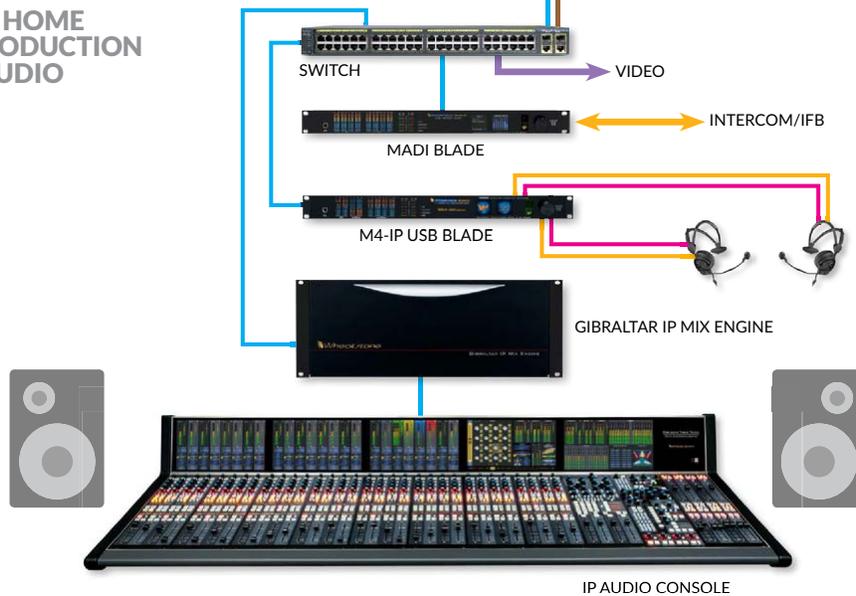
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REMOTE VENUE(S)

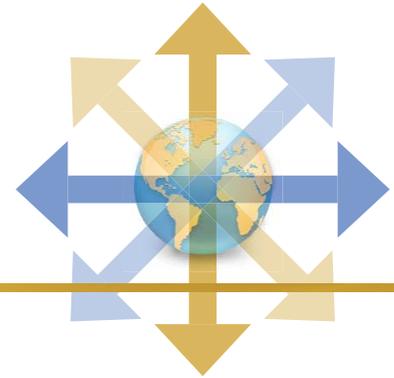


- SDI
- ANALOG
- ETHERNET
- IFB (0 LATENCY)
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- 📡 WIRELESS MICS

AT HOME PRODUCTION STUDIO



AES67 INSIDE



The inclusion of AES67 audio transport in the new SMPTE ST 2110 standard is one more example of the rapid and widespread adoption of this standard in providing signal interoperability across all of the current leading IP based audio networking systems.

Wheatstone has been a supporter of this IP audio interoperability standard since the beginning, first as a member of the AES X192 task force that formulated the requirements for AES67. In fact, Wheatstone's solution for stream discovery and connection management is described in the appendix of the AES67 standard itself.

More recently, Wheatstone has been a full participant in plugfests and tradeshow demonstrations of AES67 in action. During the recent Houston InterOp plugfest sponsored by Video Services Forum (VSF) in August 2017, we successfully ingested IP audio streams into our WheatNet-IP Audio network BLADEs from a variety of different manufacturers via AES67.

The following month we met again with fellow vendors, and demonstrated AES67 compatibility as a participant in the IBC IP Showcase in Amsterdam.

We built AES67 compatibility into WheatNet-IP audio networking products because we recognize the importance of this standard as a way to transport audio from, say, a broadcast group that might have one network platform (such as a WheatNet-IP system) and a remotely located production facility that has another (such as Dante).

What AES67 Does

Almost all audio networks use a standard IP protocol called RTP (Real-Time Protocol) to load continuous audio data into a fragmented stream of IP packets. RTP provides identification in the packets about their creation time and order but, prior to AES67, it has been up to the IP audio network manufacturer to embed and extract this information and to recreate the audio. Each differs in the specific packet loading, timing and synchronization mechanisms within the protocol.

AES67 came along to provide the common synchronization, clock identification, session description and other interoperability recommendations we can all share. AES67 adopted the PTPv2 (Precision Time Protocol - IEEE 1588-2008) standard as the master clock reference, so we can transport audio between our various systems without data dropout from unmatched clocking.

What AES67 Doesn't Do

While AES67 provides a common transport standard to move audio from one system to another, it does not specify discovery, stream management, and associated logic functions for controlling devices on the network.

Turning devices on and off, controlling peripheral gear from the console, signaling when a source is ready for air play, and controlling the playout system with a fader channel – these are all functions of WheatNet-IP and similar audio networks.

In the case of WheatNet-IP, for example, a single Ethernet cable carries the real-time audio stream as well as network and device control data critical to the daily operation of a studio. ●

DO MORE. A LOT MORE.

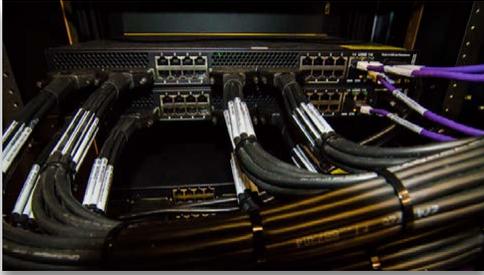
There's far more to Wheatstone's WheatNet-IP system than simple routing.

The phone comparison is a good analogy – in WheatNet-IP there's a world of audio modification tools and control options that allow you to create solutions unique to your applications with ease. All work with existing standards and are created to evolve with emerging and future standards as well. It's the evolution of standard routers.

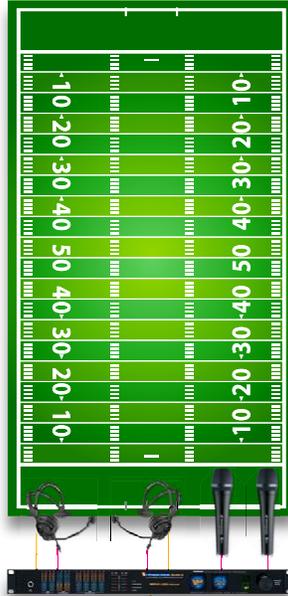


- Full Crosspoint Routing of Audio and Logic
- Send and receive AES67 streams
- Handles multiple audio formats (Analog, AES, MADI, HD/SDI)
- Create, Store, and Fire Routing Salvos
- Software based mixing built into each BLADE
- HD/SDI De-embedding
- Mix Minus creation
- IFB using triggered crosspoint control
- Routable EQ and Dynamics channels
- GPIO on each BLADE for triggered functions (salvos, IFB, Crosspoint control)
- Software Logic Ports for Control over IP
- Built in Audio Clip Player

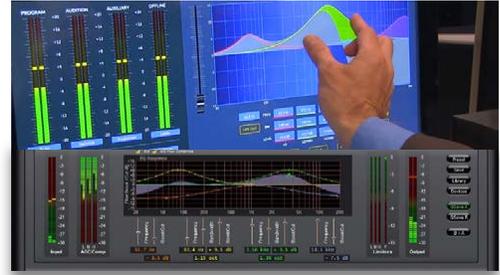
SOLID GIGABIT ROUTING



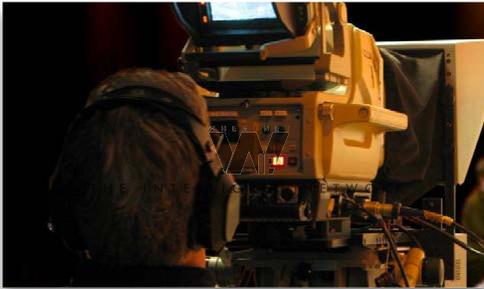
REMOTE/AT-HOME PRODUCTION



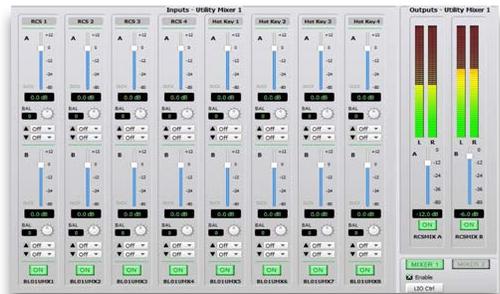
INTEGRATED SIGNAL PROCESSING



INTEGRATED IFB



VIRTUAL MIXING



SMART CONTROL SURFACE INTERFACES



CONTROL/LOGIC OVER IP



THIS IS YOUR IP AUDIO ROADKIT

BLADE-3s provide hassle-free advanced feed and management of audio from mic source to mixing console.

All audio channels can have sequences of processing, routing, or mixing services automatically applied through the use of stored presets. All control services can manage any mixing, processing, routing, or storage. Entire workflows can be stored allowing you to repurpose your network with a single preset. This empowers a whole new level of the control over live programming.

All built into every BLADE-3 on the network. Powerful stuff.

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