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A sample of the KWVA music library, with a labeling project in process.

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On the cover: Air 2, one of KWVA's two air studios, ready for use.



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World Radio History



by Lee G. Petro

New Regulatory Relief Efforts for Broadcasters

In the past few months, the Federal Communications Commission has taken steps to deliver significant regulatory relief to broadcasters. Not only has the FCC sought comment on proposed rules to eliminate the local main studio requirement, it is also seeking broad comment from the public proposing the revision and/or elimination of broadcast-related regulations. Finally, the FCC issued a declaratory ruling indicating that broadcasters may rely solely on the internet to widely disseminate hiring opportunities.

MAIN STUDIO RULE

One of the central tenants of the FCC's regulation of broadcast stations has been the idea that the local broadcast station serves as the critical hub of engagement between the station and its local community. To that end, the FCC requires broadcast stations to maintain a main studio in or nearby the station's community of license. That main studio must be staffed by full time employees, open during regular business hours, and until recently, maintain a public inspection file.

As discussed in the March 2016 update, the FCC modified its local public inspection file rules, instead requiring that all radio stations migrate their files to the FCC-maintained website no later than March 1, 2018. In doing so, the FCC determined that the public rarely visits broadcast stations to review public inspection files, and that posting this information online may encourage more public participation.

More recently, the FCC severed the last link between the public inspection file and the local main studio when it eliminated the requirement that broadcast stations maintain copies of letters from the public in their public inspection files.

Now, the FCC has proposed to completely eliminate the requirement that broadcast stations maintain a local main studio. If adopted, broadcast stations would no longer be required to employ full-time staff or maintain the ability to originate programming, in the local community. The FCC does propose to continue requiring that the broadcast station maintain

either a local telephone number or a toll-free number.

The deadline for comments in this proceeding has yet to be announced.

UNDERBRUSH 2.0

In the 1980s, the FCC launched several rulemakings in attempt to clear the "regulatory underbrush" affecting the broadcast and cable industries. At its May 2017 meeting, the FCC adopted a public notice that could be the start of a new underbrush clearing exercise.

In particular, the public notice calls for public comment addressing "unnecessary regulations and undue regulatory burdens that can stand in the way of competition and innovation in the media markets."


Rather than target specific regulations, such as the main studio rule discussed above, the FCC released an attachment that merely listed each of the rule sections setting forth the procedural and substantive regulations affecting broadcasters, antenna structure registrants, multi-channel video program distributors and satellite licensees. As such, it would appear that there is no limit to what the public can propose, and no apparent constraints to what regulations the FCC may propose to modify or eliminate in a future rulemaking proceeding.

The deadline for comments in this proceeding has yet to be announced.

EEO RECRUITMENT

Finally, the FCC responded to a petition for declaratory ruling in April, and determined that broadcasters, cable and satellite TV providers may now solely disseminate employment opportunities with online sources.

Previously, the FCC had required the use of a blend of different sources to widely disseminate employment opportunities, including on-air and newspaper. In fact, the FCC issued an \$11,000 forfeiture order in 2016 to a MVPD that only posted employment opportunities online.

In light of the declaratory ruling, the FCC will now permit broadcasters and MVPDs to meet its general obligation to publically announce employment opportunities solely online. This change does not eliminate the requirement that broadcasters and MVPDs provide notice to specific organizations that have requested notice of employment opportunities. Additionally, broadcasters and MVPDs will need to comply with the obligation to participate in a "menu" of outreach efforts (job fairs, internships), and maintain records detailing their efforts and submission of the periodic FCC forms documenting these efforts. 

DATELINE

July 10 — Stations must place/upload second quarter 2017 issues/program lists in their public inspection files.

Aug. 1 — Stations in California, Illinois, North Carolina, South Carolina and Wisconsin must place their annual EEO public file reports in the station's public inspection file.

Aug. 1 — Stations with 11 or more full-time employees in California must file a broadcast midterm report (FCC Form 397) with the FCC.

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

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| | 14:38:43 | 0680-09 | 02:39 | AUDIO | Alters - Never Going Back To OK |
| | 14:41:21 | J0002 | 00:08 | AUDIO | RASE 101 - Boston's New Country |
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Virtualization: What Is Happening to My Studio?

by Chris Wygal

For the past ten years, I have had the honor of representing Radio magazine at the NAB Show in Las Vegas. It's an immersive experience that is educational and overwhelming.

It's educational because broadcast companies from around the world gather to exhibit new products and introduce new ideas to our industry; and it's overwhelming because of the information-overload that inevitably takes place!

By way of adding to this whirlwind of information, each year the Radio editorial staff charges me with two primary objectives: Walk the entire floor and see as many exhibitors as possible and — this is the biggie — keep an ear to the ground and sniff out a common trend. (It's hard to sniff with your ear, but you get the idea.)

Prior to this year's convention, finding a trend was difficult. It usually involved weaving together common threads that were represented by vastly different industry players

For example, only a few years ago, minimal-footprint LED light panels and affordable 1080i cameras were paired to create a recipe for increased video creation in radio studios. Another year, we saw day-to-day "radio" functions migrating to smartphones. Then, the outbreak of high power solid state transmitters took the stage.

Specific to radio, last year's NAB Show touted the explosion of AoIP and AES67. Whether we welcome the notion or detest it,



broadcasting is dependent on IT infrastructure, now more than ever. Multipair cabling and even TDM technologies have faded into the past as we packetize our audio plants via IP switches and routers. Management systems like AES67 are being adopted at lightning speeds as we try to harness the IP world and streamline it for broadcast.

If that isn't proof enough that our world is changing, consider this: the Broadcasting Engineering Conference held each year at the NAB Show changed its name to the Broadcast Engineering and Information Technology Conference. Yes, indeed. Times, they are a-changin'.

So that brings us to the trend that was gleaned from this year's spring show. What stood out in the Radio Hall? What was the buzz?

VIRTUALIZATION

Words like "the cloud" floated (pun intended) throughout the convention.

Lawo's Director of Virtual Projects Michael Dosch and Senior Project Manager Stephan Turkey delivered a presentation during which they coined the phrase "AoIP 2.0."

AoIP 2.0 is a convergence of IP power and PC power.

"The first wave of AoIP united physical devices via Ethernet. The second wave will take the software apps that replace those physical devices and unite them, using IP inside a virtual machine environment," Dosch said.

How did his quote manifest on the exhibit floor? Obviously, through the Lawo CLEAR



The Logitek Helix is but one example of the virtualized control surface.

and R3LAY Virtual Radio Mixers.

But I personally saw it most clearly at Logitek. Their Helix console exists as a typical IP radio console, and it was prominently displayed at the front corner of their booth. But here's where things changed.

A few steps away, that same Helix console existed on a crystal-clear Microsoft Surface Studio that was running the Helix app. It was remarkable.

The Surface Studio screen pivoted and articulated for optimal ergonomics, and the entire Helix console was virtually in front of me. I could touch the screen and operate faders and push buttons on a sleek, clean surface. The physical Helix console didn't (dare I say this?) need to be there. The control was virtually onscreen at my fingertips.

To give credit where it's due, note that Logitek's virtual Helix console was mind-blowing, but the technology has been around for a while. Wheatstone and Axia, for example, have made virtual versions of their consoles

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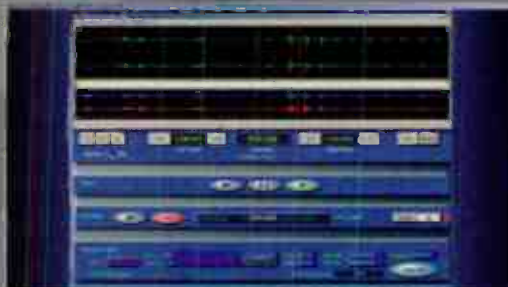
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available for some time.

For that matter, diverging away from the console discussion, the Report IT app from TieLine has made robust live reporting available on iPhones and Androids.

You might say, "But what about my trusty codec?" ipDTL is doing something similar. They have a web browser that can (using a computer) call landlines, send and receive ISDN calls and call cell phones. That's all via IP.

If you thought we couldn't go any further with virtualization, hold tight. Our microphones aren't immune to the trend, either.

At the 2017 NAB Show, Audio Technica unveiled a dynamic microphone prototype with no more than an RJ-45 jack on the end of it. Inside the mic was the technology that made it IP-addressable. It was, in and of itself, a networkable audio device. With this, the only non-digital parts of the audio chain are the microphone element and the human voice.

We all know that broadcast engineers like



Logitek's Helix Radio Console as viewed from the side.

toys. We get a kick out of seeing new stuff and an even bigger kick out of installing it. It's why more than 100,000 NAB Show

attendees converged on Las Vegas this year. We want to see what's on the horizon and put our hands on it.

This is also where things get interesting.

I witnessed the virtualization discussion at the convention in April, and on social media and email list servers since. Nobody who attended the show was about to ignore the prevailing IP virtualization theme, and it sparked lively discussion. The response has been both positive and negative.

THE CONS


Virtualization is seen by some as robbing our profession of a tactile connection.

What's the first thing we do when we see a radio console on display? We grab a fader and see how smoothly it tracks. We push a cue button to see how responsive it is. We turn a headphone volume knob.

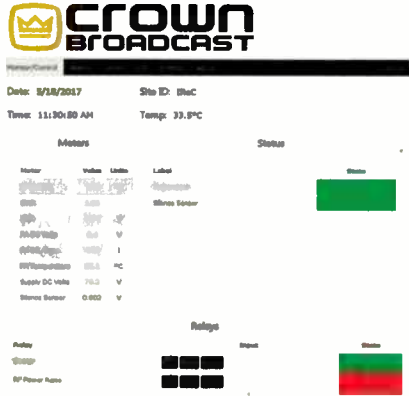
Any audio technician or board op will attest to the fact that after some time, he or she can almost operate a familiar console blindfolded. There's a human element involved in actually operating a physical piece of equipment.


A great example is a flight simulator. Flying a computer and flying an actual airplane are two different things.

I was talking to one engineer, and he said, "If I'm looking away and I need to ride a level, I can feel the fader with my hand and adjust accordingly. But if that fader is on a screen, how do I know where it is?"



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Another engineer said, "I understand having all my ployout and automation living on a PC. But we're getting to the point where my entire station can live in the cloud, or at the very least on a couple of PCs in the corner of the room. What do I do when it crashes?"

However, the purpose of this article isn't to answer those questions..

THE PROS

Virtualization is an impassioned topic of discussion for many broadcast engineers. And while plenty see the physical audio plant going up in a cloud (another intentional pun) of smoke, another group sees potential in the inherent scalability and cost-effectiveness of PC and IP based virtualization.

I'll again refer to Lawo's Stephan Turkey, who said, "We eliminated tape machines and

To put this into perspective, a school group recently came by our studios for a tour. When they made their way to the engineering room, I demonstrated how I could access the radio consoles, AoIP interface, air processors and

automation all on my iPhone.

The parents thought it was high-tech wizardry and were astounded that this kind of technology even exists.

The kids? They were ready for snacks. ☺



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— Sam Caputa, Director of Engineering, Emmis Communications.

We all know that broadcast engineers like toys. We get a kick out of seeing new stuff and an even bigger kick out of installing it.

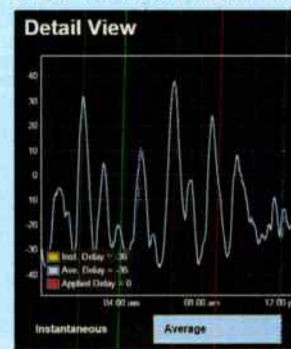
charts 20 years ago in favor of PCs — and PC power has doubled many times over since then — but we still use it in the studio just for play-out! There's a lot we can do with that power."

In many ways, the radio industry seems to be echoing Turkey's sentiments. As time goes on and other sectors increasingly depend on and demand more IP and computing integration, broadcasters are doing the same.

When we look at a tablet or phone or touchscreen computer and see our broadcast operation living in a virtual environment it's important to remember the 20-somethings who will soon inherit our broadcasting realm.

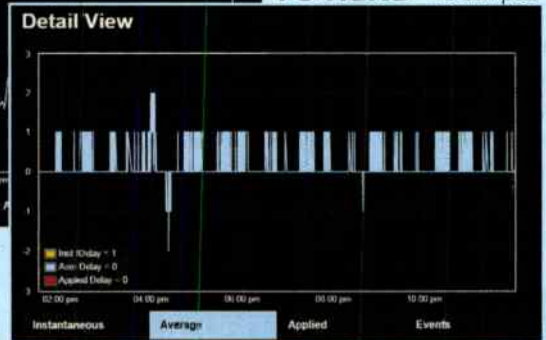
When some of them were only months old, they learned how to use touchscreen surfaces. The upcoming generation knows little to nothing about a 66-block or a balancing transformer. They know IP, and they are almost expecting technology to not just be "digital" but virtual.

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Dual Booting Tips for Running Linux and Windows

by Chris Cottingham

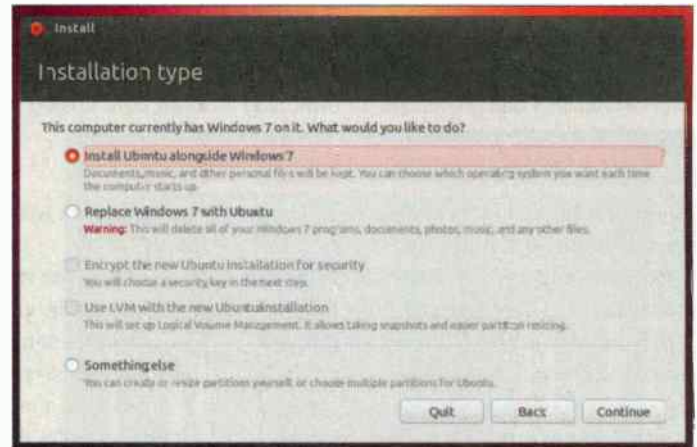
Last month's article focused on Linux, what it is and how to install it on a computer. This month will cover installing Linux alongside Windows.

Ubuntu and other Linux distributions make dual booting easy, once certain configuration issues are addressed.

Dual booting requires that space be made on the hard drive for both operating systems. Dual booting also installs a boot loader that will allow the end user to choose which

system to boot from. As always, when performing any type of work on a computer, make a backup before doing this!

As I mentioned, Linux and Windows need space on a hard drive. When deciding how to address this, the end user can install a second hard drive and let each operating system have its own physical hard drive



It's easy to install Linux and leave space for Windows.

or a single hard drive can be partitioned.

Since most people will dual boot Linux on a laptop, adding a second hard drive is not an option. Partitions are logical divisions of space on a hard drive. When Windows or Linux is installed as the only operating system, they will usually create partitions that take up the whole hard drive. With this in mind, we can install Windows and choose to leave space for Linux, or we can install Linux and leave space for Windows. The point is that space is needed on the hard drive for each operating system. It is easier to allocate space for Linux or Windows during installation than after it.

SHRINKING WINDOWS OR LINUX

Linux can be installed on a hard drive already running Windows, but there is a catch: The Windows partition on the hard drive needs to be resized (shrunk down) to open up space for Linux.

Windows has a built in utility called disk management (diskmgmt.msc) that can be used to shrink the Windows partition. Disk Management makes resizing a Windows partition easy.

Open Disk Management. Once open, it will display all the available partitions on the computer. Simply right click on one partition (Usually the Disk 0, C: drive) and choose "Shrink Volume" from the drop down menu. A window will open asking you how much you

CONTINUED ON PAGE 20

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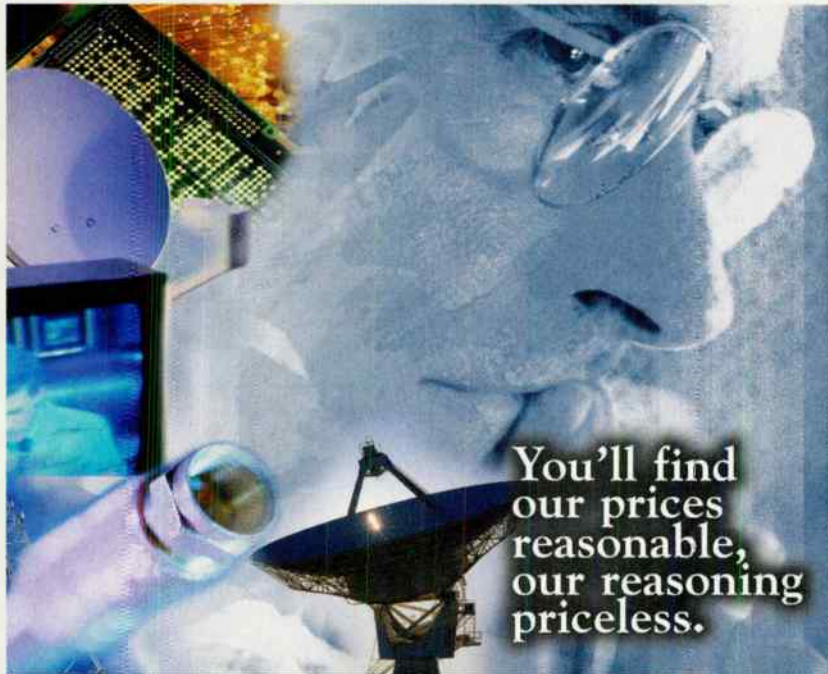
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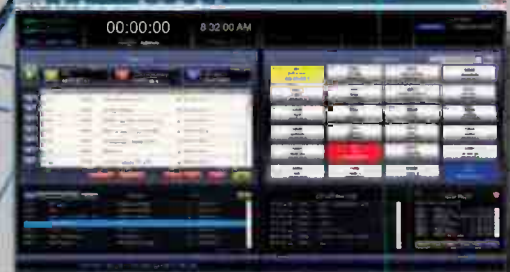


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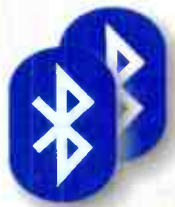


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CONTINUED FROM PAGE 16

wish to shrink the partition. Select the amount and click OK. You are done!

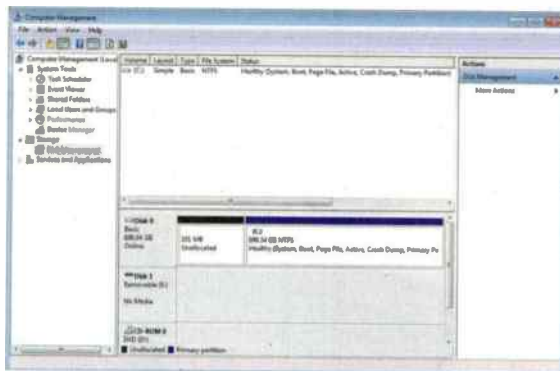
The amount of space that needs to be created by shrinking the partition varies with intended use. The base install of Linux requires about 4 GB of space. In reality, you should allocate at least 20 GB of space for the Linux installation. There is not a specified percentage, per se; it is really up to the end user as to how much to rob from their Windows partition for the Linux install.

There is also a Linux based utility called GPartd that will accomplish the same task.

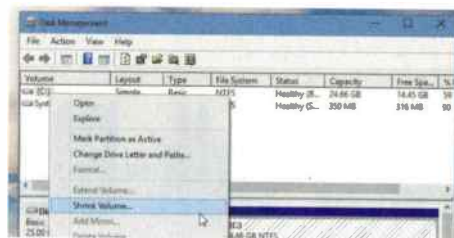
GPartd is a free bootable Linux-based CD used specifically for partition management. It can be downloaded from gpartd.org.

This utility will work with Linux, Windows and many other types of partitions. Once booted and running it will display all of the partitions on a hard drive and allow you to remove, resize and reorganize the partitions.

GPartd is easy to use. Select the partition that you wish to resize and



Windows has a built-in utility called disk management (diskmgmt.msc) that can be used to shrink the Windows partition. It makes resizing a partition easy.



Once disk management is open it will display all the available partitions on the computer. Simply right click on one partition and choose "Shrink Volume" from the drop down menu.

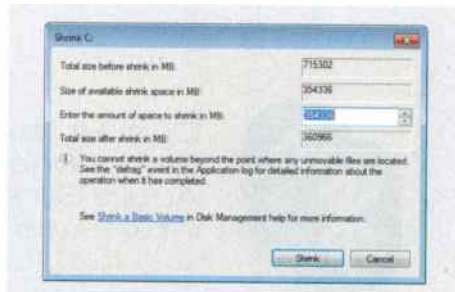
then choose resize/move from the partition menu. Once the resize window opens, simply drag the arrows to the desired size and click on the resize/move button. That is it! The partition will be resized.

The advantage that Gpartd has over the Windows utility is that it can move partitions. The Windows utility will only allow the end user to shrink the partition. But what happens if there are partitions between the free spaces you want? Well, Gpartd will allow you to move them out of the way.

One more note about resizing partitions: Data can be lost when resizing the partition on the hard drive. Make sure you have a backup of your Windows machine before making any partition changes!

BOOT LOADER ISSUES

Another issue with dual booting involves the boot loader. A boot loader is a piece of software that tells the computer where to find the installed



A window will open asking you how much you wish to shrink the partition. Select the amount and click OK.



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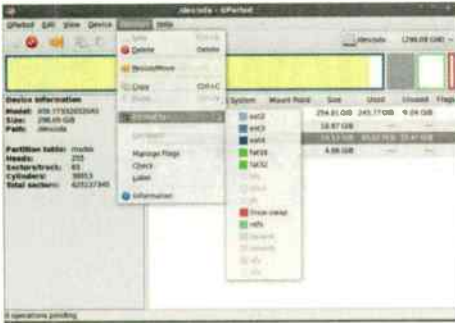
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The Linux-based utility GPartd



Select the partition that you wish to resize.

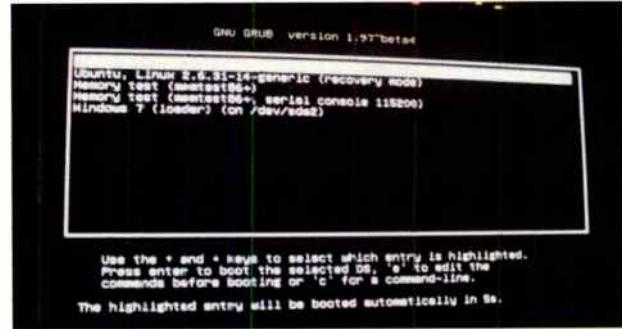


Once the resize window opens, simply drag the arrows to the desired size and click on the resize/move button.

operating system and start it.

Boot loaders are installed by the operating system at the time of install. If we install Windows after Linux, Windows will overwrite the Linux boot loader. Linux, just like Windows, will overwrite the Windows boot loader during installation.

The Linux boot loader is preferred over the Windows boot loader because the Linux boot loader displays a menu upon booting that allows the end user to choose which operating system to load. The Linux install process will detect the Windows partition and automatically add the Windows operating system as a boot option in the menu. Windows will not detect Linux at install, nor will it install a menu option for booting into Linux. We can see that the best (and easiest) way to fix



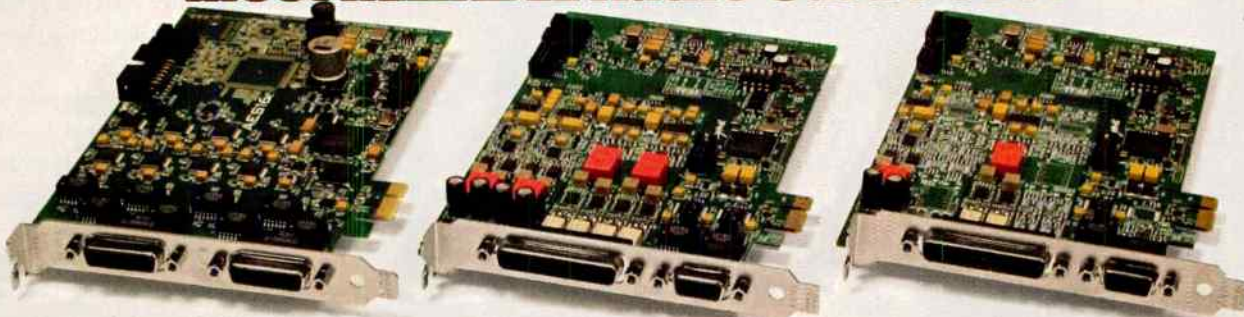
The Linux boot loader is preferred over the Windows boot loader because the Linux boot loader displays a menu upon booting that allows the end user to choose which operating system to load.

the boot loader problem is to load Linux after Windows.

Dual booting is a great way to utilize Linux and Windows without the need for additional hardware. 0

Cottingham is a former radio chief engineer, now working in streaming media.

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KWVA Customizes Workflow to Fit Students' Needs


by Mark Greenhouse

KWVA(FM) broadcasts from the University of Oregon campus in Eugene, Ore. A wholly student-operated college radio station owned by the university, KWVA plays a mix of music, talk shows and live college sports broadcasts on 88.1.

Originating in the 1950s as KWAX, it served as an academic laboratory providing daily services for the campus and community. Becoming an NPR affiliate in the 1970s, the station and the university ended up cutting ties and in the early 1980s, KWAX moved off campus.

It was nearly ten years before a student body petition and ensuing university approval provided a whopping \$25,861 to cover the costs for construction of the new station and its first year of operation. However, due to an FCC objection to the proposed antenna positioning, it was more than three years before the amended application, antenna installation and newly renamed station was complete.

The premiere KWVA broadcast took place in May 1993, with 500 W and the mission to provide a forum for cultural and educational exchange for the University of Oregon students. In 2008, KWVA relocated its transmitter, upped the signal strength to 1 kW and upgraded the facilities, which vastly increased its listenership to all of Eugene/Springfield and



Learning how to “spin” — whether records or CDs — is a popular course of study for students in college radio. Oliver Neill, previous programming director and current DJ, demonstrates.

the surrounding areas.

Fast forward to 2016 — and now working with part of a \$95 million budget — KWVA is firmly reimagined as a state-of-the-art broadcast facility located in the newly reconstructed student union. There is a large open performance space outside the studios wired for broadcasting live shows, two dedicated on-air studios and two production rooms, which are also broadcast-capable.

PREREQUISITES TO CONSTRUCTION

The station was designed by General Manager Charlotte Nisser and Chief Engineer Ali Abdul-Sate. They collaborated on the layout, studio configuration, equipment and cable paths. Equipment selection generated a spate of budget issues, including the need to go through the university and state processes for



Lawo and WideOrbit in Air 2. Installation was simple — just a few cables.

major purchases.

They kept the facility fabrication close to home by utilizing nearby Portland, Ore., specialists: SERA Architects handled the room construction; Lease Crutcher Lewis served as the general contractor and for construction management; Glumac was the MEP, in charge

of the mechanical and electrical engineering responsibilities; and Listen Acoustics handled audio control and isolation.

Two buildings underwent transformation: the original KWAX building was remodeled, and the Student Union was demolished to make way for new construction. The university threw a farewell party dubbed “Demolition Sayonara,” inviting students to bid graffiti farewells with cans of spray-paint and sling-

shot-launched balloons filled with paint — and then provided them implements of destruction, handing out sledge hammers and pickaxes to turn the decorated hulk to rubble.

During construction, some old gear got pulled out of storage, including cart machines and carts

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Student DJ using Lawo crystal console in Air 1.

that KWVA first used to broadcast in 1993.

“We intend to put these on display for incoming tours and volunteers to see some historic audio/broadcast gear. We’re finding having these on display is more and more important as current college students don’t know what a ‘cart is!” Nisser said.



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LET'S GO INSIDE

Club-sandwiched between a pizza parlor, student lounges, business offices, study spaces and a high traffic corridor, Nisser and Abdul-Sate predicted noise issues. They attenuated the racket by adding acoustic rated glass to the hallway sides of the live on-air studios.

“This decision afforded a two-fold value, allowing the talent to not feel like they were in a cave and to let passersby see the activities in the studio — from solo DJs to live interviews with bands,” said Nisser. “We spent a great deal of time working through and balancing the acoustic needs of the radio station and the acoustic impacts of the student union programs around the station.”

As an educational environment, the university provides a variety of formats for the students producing content. The on-air studios (approximately 14 ft. 5 in. x 15 ft. 7 in.) provide seating for five around EV microphones, with room for an additional four chairs and gallery seating for three along the wall.

Lawo crystal consoles were designated for all facilities; in the on-air studios Abdul-Sate put 16-channel boards, while both production studios were equipped with eight-channel versions. Powered by Lawo Compact Engines, remoted to the rack room and each occupying only one RU, they incorporate a redundant power supply and optimized expansion slots for additional I/O cards. Audio signal processing is selectable at 44 k / 48 k, and each channel presents three fully parametric EQs, gating, compression, expansion, limiting, de-essing and up to 320 ms delay. AutoMix and AutoGain controls provide further ease-of-use.

Lawo customized KWVA's console GUIs using

its VisTool screen-building software. Potential objects for the GUI include buttons, meters, text displays, faders and rotary controls. Windowed or full screen video images can be displayed. Web objects can also be placed on the screen for display and interaction. A Boolean logic engine creates conditionally-aware functions.

With the ability to offer different operators either a fully accessible console or a restricted interface defined by user rights management, Abdul-Sate said, “The Lawo crystal system fit the KWVA workflow because they can be customized to do anything. In a facility staffed by over 150 volunteers, with a mix of sports, news and music programming, we really needed that ability.”

Nisser reflected, “Just power and network cables. Such a change from our old set-up!”

Each control room is outfitted with Denon DN-C635 CD players, the Technics SL-1200MK2 turntables and Pioneer DJ CD “controllers” with a Denon mixer. Yamaha and Fostex speakers and ART headphone amps providing air, cue and talkback monitoring.



The rack room, seen with an old transmitter that will be used as a back-up.

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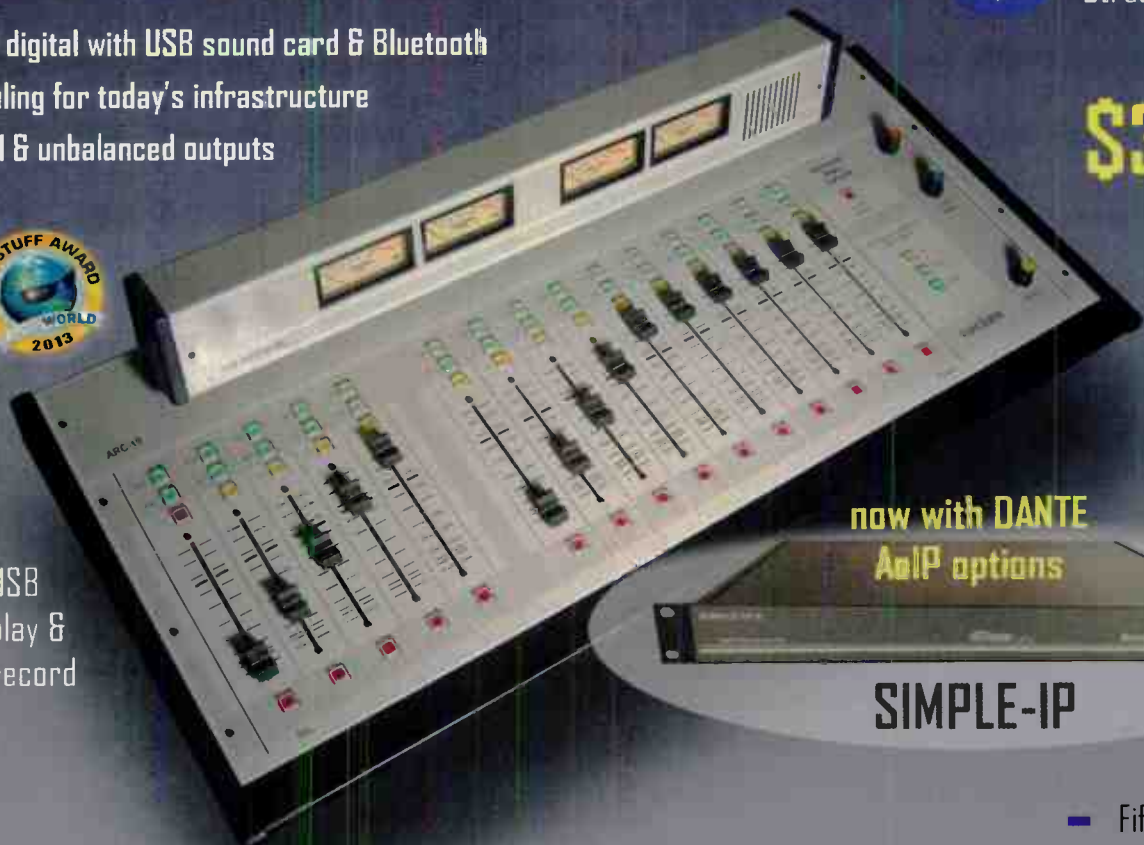
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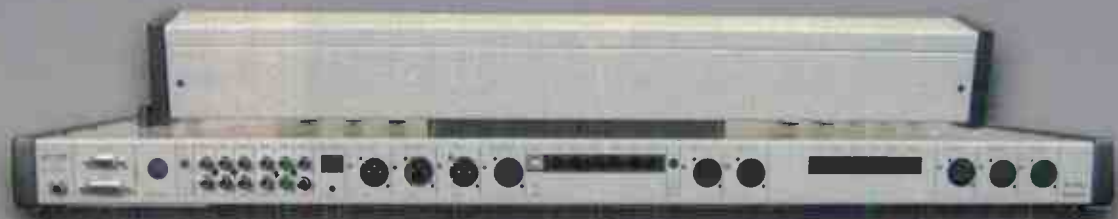
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The production rooms have seating for four around two Shure SM7B microphones, Tascam CD-RW901SL CD players and National Broadcast System's Natural Music software.

Every Sunday, the students broadcast a two-hour "Live Session" from the open, multi-purpose lounge located in the Student Union right outside KWVA. Eight mic patch points routed to a Mackie 1642VLZ4 (16 channel) located in production room one allow the mix to be directed to either of the on-air studios for live broadcast or recording. For post-production, Audacity and Adobe Audition are used to edit stereo files, along with the increasingly popular Cockos "Reaper" DAW for multi-track recording and mixing.

INTO THE ENGINE ROOM

In this three-rack room, we find shore power, electrical breakers for the entire facility and power distribution connected to the 2000-watt APC UPS. Network and telephone jack patch panels, audio I/O and CAT-6 ties, RF distribution, a Lorex DVR for facility-wide security video recording and ceiling speaker amplifiers flesh out another rack.

You'll also find the main and backup network-attached storage drives, the 24/7 on-air archiver, an audio switcher for the air chain (which switches individual studio program, automation, emergency CD and future backup



From the studios looking down the length of the station. The offices are at the end of the hall.

automation), a 25-Seven systems Program Delay Manager, and a silence sensor.

The central router is a Lawo Nova 17, a 512x512 with 16 (opto-coupler, relay and VCA) GPIOs, 16 Analog IOs, eight digital AES/EBU IOs and an internal 288 IO matrix. Used for control, sharing of sources, monitoring, backup feed and central recording, Abdul-Sate noted that it is not in air chain. Connections to the studios are via multi-mode 62.5-micron fiber.

Two Telos ProStreams with 24-bit A/D converters and the choice of MP3 or AAC-LC, HE-AAC, HE-AAC v2 coding and output bit

rates between 16 and 320 kbps maintain the two streams' online presence. Integral to the Prostream is Omnia processing, adding wide-band AGC, three-band compressor/limiter, EQ, low-pass filter and a look-ahead final limiter. A Shoutcast server running on a PC using Linux is also employed.

A Sage Endec and Crown receiver supports the EAS system, and FM confidence receivers are also stationed here.

Comrex Access IP codec permits live audio from the field (no more ISDN drops required) and a Comrex Matrix provides wideband, broadcast quality audio over POTS lines.

A Broadcast Tools air chain switcher is used to switch studios and streams via a virtual interface for the sports department.

Wide Orbit automation running on Dell PCs is available in the all studios and production rooms. Racked speakers and audio meters round out monitoring from the rack room.

TRANSMISSION

The studio-to-transmitter link is a Harris Intraplex T1 system combining bi-directional transport of program audio with a wide variety of other traffic including LAN/WAN data, telephone, intercom, fax, and remote control data. It is backed up by an equalized, direct line (sources are switchable). Orban makes the FM processor (located at the transmitter). The station is planning to add a backup transmission site in the future. **0**



Graduation day for some of KWVA's student staff. Did their radio careers end, or have some taken their skills and made careers in radio? Shown from left to right are: Production Director Jake Soffer, Assistant General Manager AJ Untermeyer, Music Director Taylor Jones, Assistant Music Director/Music Blog Coordinator, Programming Director Gabrielle Muller, Oliver Neill and Programming Director Ryder Sherwood. (The titles reflect the positions they held during the year prior to graduation in 2016.)

Mark Greenhouse enjoys being the A-1 lead on great big complicated once-in-a-lifetime stadium events and solo wilderness backpack camping.



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Recycling Center Inspires Station to Save Energy With New Transmitter

by Elaine Jones

The author is a spokesperson for Nautel.

When Brian Walsh of Warsaw, Ind.-based WIOE participated in a remote broadcast at a recycling center last November, he had no idea his conversations would lead to the acquisition of a new energy-efficient transmitter from Nautel.

"During our remote at the Kosciusko County Recycling Depot, we were talking with representatives not only about recycling

programs, but other programs where people could get credits for energy efficient purchases," Brian recalled. "I asked an energy adviser from KREMC, a northern Indiana electric cooperative, whether there are business credits available. She said, 'Yes, but you have to apply for them!'"

Brian then called on Nautel Sales Engineer Jeff Welton.

"We had been considering a new transmitter, and Nautel was on my short list, so I mentioned the energy grant to Jeff," Brian said.

"Jeff told me that, between the energy grant and some promotions being offered at the time by Nautel, I could save quite a bit of money.

Brian submitted Jeff's purchase proposal to the Power Moves program in Indiana, and after a couple months, I received a grant that covered about 10 percent of the transmitter cost!"

WIOE purchased an NV5LT FM transmitter, which features a modular design for redundancy, on-air serviceability and high

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WIOE's NV5LT FM transmitter features a modular design for redundancy, on-air serviceability and high AC-to-RF efficiency.

efficiency. Some of its other features include a streaming input and Livewire capability, on-board instrumentation, Nautel's Advanced User Interface control system (accessible via IP) and an integral exciter.

"Jeff told me that, between the energy grant and some promotions being offered at the time by Nautel, I could save quite a bit of money."

— Brian Walsh

Brian reported a smooth installation and easy switch-over from his old Energy-Onix ECO 6.

"The pre-installation and operating manuals are well written and organized by engineers, so the installation was smooth, from start to finish," he said.

"The efficiency of the NV5LT is as good

as Nautel had promised. Even better, the power savings are superb. Our normal usage prior to this installation was 270 kWhs per day. Daily usage now is between 180 and 188 kWhs. The only downside is that I'm now going to have to use our HVAC system to heat the building in the winter... there's no heat from the Nautel unit!"

GET YOUR OWN

Brian recommends that stations contact their local power agency when considering a transmitter purchase to see if energy credits are available — especially if they are considering a highly energy-efficient transmitter.

"The credit we got from Power Moves was significant and helped to offset the cost of this important piece of equipment," he said. "I hadn't thought of it until the opportunity was staring me in the face at our remote." 📻

Editor's note: At the NAB Show, Nautel announced that NVLT Series transmitters can now be field-upgraded to support HD Radio transmission with an add-on exciter.

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Is triple j's Hottest 100 the Biggest Streaming Radio Event in the World?

by James Cridland

Every year on Jan. 26, a curious thing happens: millions of Australians get together with their friends to listen to the radio.

They tune into national youth station triple j: The station is the voice of young Australia, and is part of the ABC, the public service broadcaster. On Australia Day, the station broadcasts the biggest songs of the past year, as voted by listeners.

"The Hottest 100 is not only a huge event for triple j, it's arguably the biggest radio event in the country," Ollie Wards, triple j's content director, wrote in an email. Millions engage with the countdown, and listeners throw parties to celebrate the year in music, with the countdown being the soundtrack. Pubs and cafes advertise that they'll play the Hottest 100 — some even try to do so on commercial radio rivals — and in 2015, over 2,500 listening parties were registered in 77 countries via the triple j website.

The numbers reflect it, too. The survey has the station's highest annual reach, and the live listeners are probably many millions more.

As a listener-voted chart, a lot of work is done to ensure the vote is accurate and unlikely to be hijacked. "A set of basic rules outline the way people can vote including a maximum of 10 votes per person and only one vote per song. Voters are validated via a social media login or email authentication to prevent duplicate voting. On the voting site, a set of terms and conditions are included that explain triple j

will take action against invalid votes, including those submitted to troll the poll or undermine the countdown," said Wards.

It's also the largest planned streaming event on the ABC's calendar. Trevor Gillespie, manager of digital platform operations for



ABC Digital Network told me via email that "the peak is always the end of the countdown at 8 p.m., with peak traffic streams at 258,000 in 2017 (up from 224,000 in 2016). At peak in 2017 there was in excess of 15G bps of traffic delivered via our various services."

These are some of the largest concurrent audio stream numbers for live radio anywhere in the world. So how do they scale? First, like any broadcaster, the ABC is used to dealing with significant spikes in demand during major events or breaking news coverage. The website infrastructure is built with scalability as a key principle.

"For API services that provide the back end of the ABC's media players and phone or tablet applications, they're hosted with Amazon Web Services. We use AWS for these APIs to take advantage of features such as auto-scaling and multiple availability zones for added resiliency and ability to cater for spikes," Gillespie told me. AWS has Australian infrastructure in Sydney, as well as other regions close to Australia.

The ABC uses Akamai's CDN to cache and

deliver content to audiences. "We leverage several Akamai features such as Prefresh to allow us to cache content for long periods of time, whilst ensuring that the sites content is updated very quickly as song titles and artwork in the countdown change."


The ABC offers audio streaming in a number of different formats and codecs. Their main format is an HE-AACv2 multi bitrate stream via HLS, switching between 32 kbps and 64 kbps. They also offer streaming via Flash, SHOUTCast and Icecast (including a 96 kbps MP3 stream).

"The bitrates are kept quite low as a high percentage of our listeners are coming from mobile networks and our experience has been that higher bitrates affect the audiences through using larger percentages of mobile data caps," said Gillespie. Australian internet subscribers have caps on both mobile and broadband connections, so data use can be a concern for audiences.

The use of a CDN does mean that the burden of such high streaming figures aren't the worry of the ABC. "For the most part, using streaming platforms provided by Akamai means that the ABC does not need to provision additional services, since the CDN scales to meet the demand. This does mean that January is a more expensive month. However, keeping the bitrates low also keeps delivery costs low," said Gillespie.

The station also provides on-demand audio of the broadcast for those in other timezones.

"The local music industry has come to see this as a benchmark for success and a tastemaker for the future, with artists in the countdown also seeing a commercial bump as a result," said Wards.

In January 2017, the number one song was Never Be Like You {Ft. Kai}, by Flume, an Australian record producer. The full chart is available online. 





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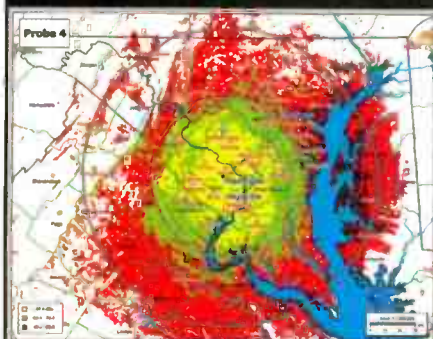


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NAB Show in Retrospect

by the Wandering Engineer

I have the greatest respect for the National Association of Broadcasters, and I'm lucky enough (or unlucky enough) to be above the line where my jobs in broadcasting really do require that I go to the "spring show" in Vegas. Survivors share stories and recount how many "NABs" they have attended — often numbering in the 40s and even 50s. Broadcasters have always loved Las Vegas. It's relatively affordable, accessible and show biz-centric. We are a risky business with risky careers, meeting in a town that thrives on chance.

"NAB," the "spring show," is our job fair and our university. We don't all have to go. In fact, someone has to stay home to keep the crank on the money machine. Some of us really aren't pushing the envelope, and we can read about what happens and what was introduced at NAB Show, even if we don't attend in person.

Sharing this information is a big part of what the industry press contributes (including this rag).

I often disagree with NAB's positions, but never the purpose.

In Las Vegas, I'll meet Doug and Emily, who put this magazine "to bed" (the press has its own buzz words!) each month, as well as some of the higher-ups in this publishing empire and a few others I rarely see. I have no idea why, but it feels good to see and touch the people I work with all year long, often in PJs at odd hours, in person. I am interested in their story — how they got here, what they believe and how and where they live — in the real world and not just the virtual work place we share.

Broadcasters disagree on more things than they agree on. Somehow, the NAB comes to a consensus to do what it does — represent us



to the regulatory and real world and organize this show. It's a nearly impossible task. A small world of politics in and of itself.

I often disagree with NAB's positions, but never the purpose. Truth is, the minority is often right, and often the majority will come around in time. I've been to NAB's offices — there are no crystal balls, just a lot of work done by a lot of staff and even more volunteers.

BEITC THOUGHTS

Then there was the rather belated rebranding of the Broadcast Engineering Conference to recognize that "information technology" is a tool we broadcast engineers use.

If the NAB BEC conference had been the "Broadcast Engineering and Ionic Tube Conference," then changing the name to the "Broadcast Engineering & Information Technology Conference" would make eminent sense.

But it wasn't, and it doesn't.

In a way, it's demeaning to think we now need "IT" inserted into the conference name or we would somehow forget that IT is a key part of our daily jobs — something we and every other business and person on earth use every day. We are not just another IT application.

Also, this year, the NAB (and oddly enough, PBS at their "Techcon") put their session info on an app and website that, unlike years past, did not display the speaker, topic, abstract and bio all together in the traditional grid. What was a beautifully comprehensive picture became a disjointed interactive pain point. We make our conference assessments looking at all of the information...who, what, when, where, why.

Looking through the key hole of our devices, thumbing left and right and up and down is like trying to perceive an elephant one square foot at a time. The app and the new tiny paper-saving pamphlet were not helpful. The seats on the plane to NAB Show might be getting tighter, the baggage and peanuts a luxury charge, but not having a complete program grid is removing the engine or the wings from the BEC.

Hopefully, these lessons can be applied next year. **O**

The Wandering Engineer is an industry stalwart who has been in broadcasting since the days of Marconi and Tesla. He gives his thoughts on the current state of broadcast engineering and the broadcast engineer.

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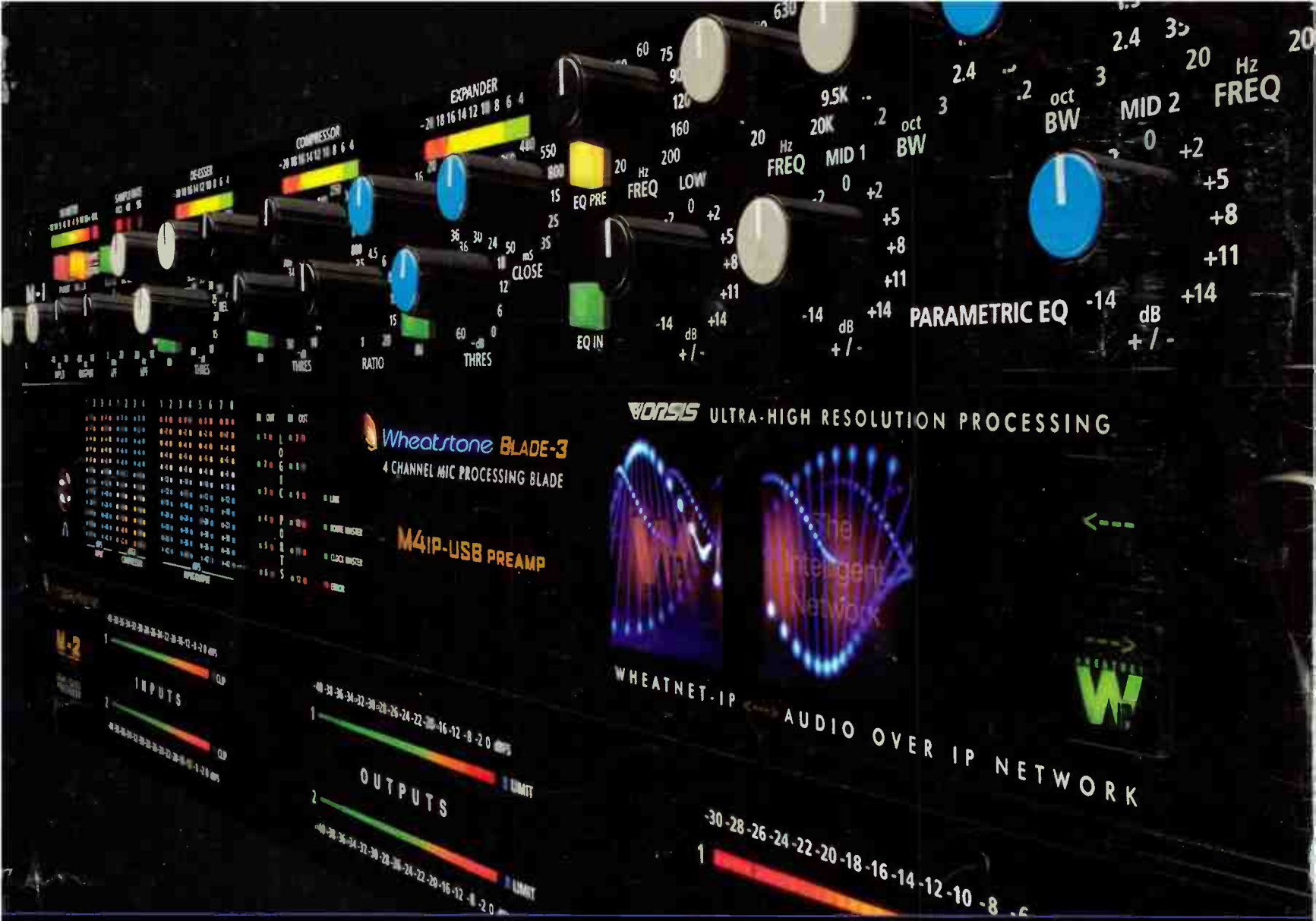
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