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Things we learn the hard way

There are some lessons an engineer can only know through direct experience.

AI opportunities

A conversation with Chris Brunt.

Voice control and you

It's an example of how radio needs to "think beyond audio."

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Mixed reviews for Class A10

Some have concerns about interference and the impact on translators

Paul McLane
Editor in Chief

Should the FCC create a new class of FM stations that would allow many Class A stations to increase power up to 10 kW?

Opinions have been flying after the FCC invited comments on such a proposal from broadcaster Carl Haynes of Commander Communication Corp. He believes a simpler version of the previously proposed Class C4 stands a better chance of winning FCC approval.

The commission received about 30 comments from industry stakeholders.

Support came from the Multicultural Media, Telecom and Internet Council; from SSR Communications, which was the main driver behind the C4 proposal; and from broadcasters like Delta Radio Network, Colonial Radio Group and Total Media Group.

They cited benefits to small and minority owners who could broadcast stronger, clearer signals; better radio service for rural areas that need news and emergency information; improvements to coverage in mountainous terrain such as rural Appalachia; and more efficient use of the spectrum.

Consulting firm Cohen, Dippel and Everist identified 16 stations it believes would be most likely to file for A10 because they are already operating at the 6 kW maximum effective radiated power for Class A. It submitted two maps showing what it found, one of which is shown on the next page.

But the National Association of Broadcasters said it can't make a recommendation yet. Class A10 might help some stations and listeners but may raise other problems, it wrote, and the petition lacks critical information.

NAB reiterated concerns it had expressed about C4. It worries about increased interference, particularly in the northeast and in California.

It said the average annual revenue for commercial Class A stations is only about $400,000, so few would be able to afford a higher-power transmitter, larger cooling systems and bigger electrical bills to extend service contours

> **"Cumulus worries that the proposal would contribute to the 'AM-ization' of the FM band."**

THIS ISSUE

NEWS
3 From the Editor
5 Chris Brunt gives Jacobs Media its AI Edge
8 FCC moves forward on AI disclosures

FEATURES
10 Do these things on every site visit
13 Make your tower site more secure
18 A DIY project with help from ChatGPT
22 Radio's evolution progresses, but we need to keep up
26 Things we learn the hard way

OPINION
29 Three key trends for the future of radio

Corrections

Our story in the July 17 issue about regional trade shows misspelled the last name of engineer Bob Stroupe. And the article in that issue about Larry Cervon referred to Silver Spring, Md., as Silver Springs.

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Right
A map by Cohen, Dippel and Everist shows Class A stations in the western U.S. that meet spacing requirements of Class A10 (black circles with white dots). Stations with a red square meet the spacing requirements and are at their currently allowed maximum ERP.

by only a couple of miles. And NAB said the petition lacks technical analysis of the impact on translators.

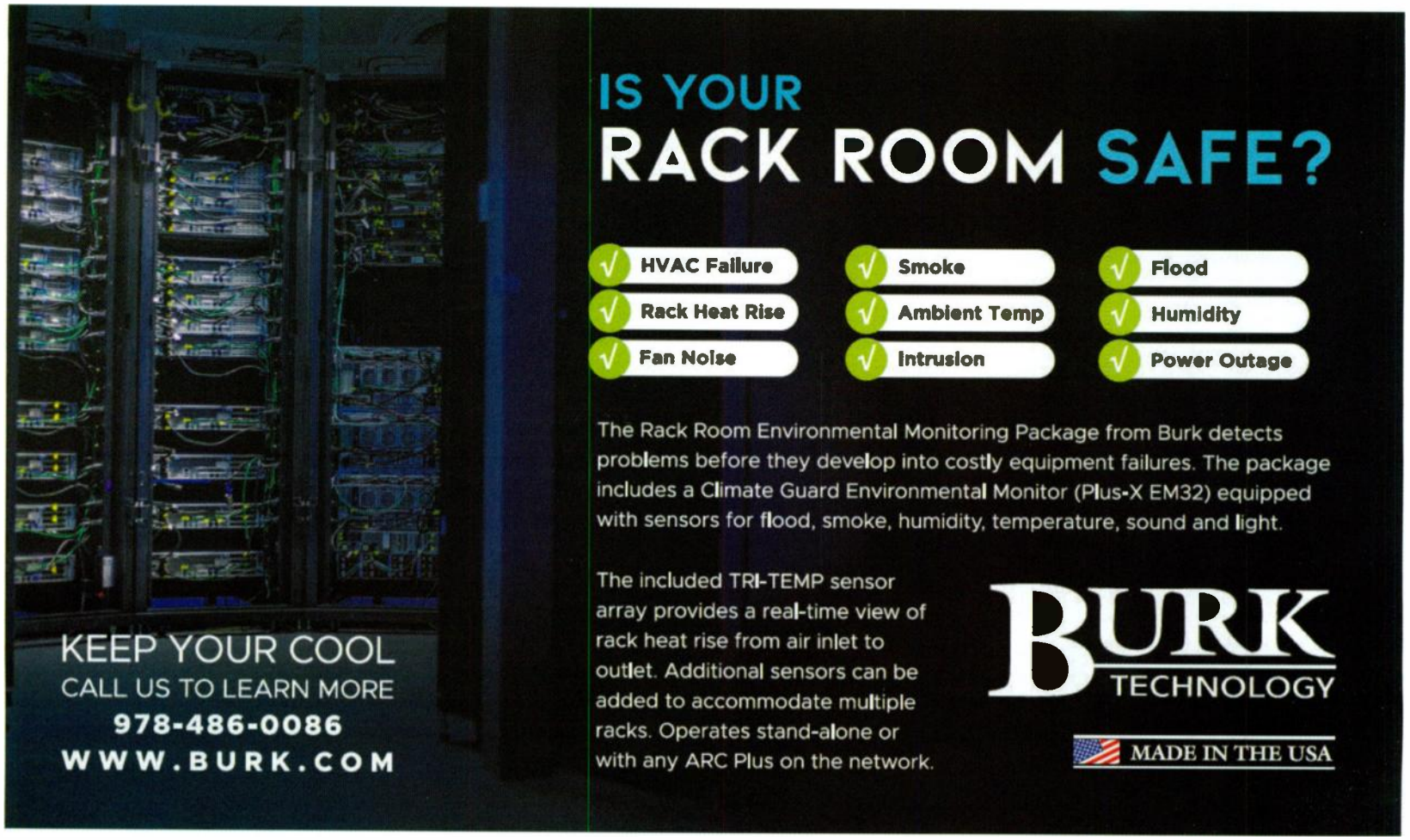
Cumulus Media, one of the industry's largest ownership groups with about 400 stations, soundly rejected A10, citing "unacceptable risk" of increased interference; harm to LPFMs and FM translators, especially those licensed to AM stations; and the impact on minority owned stations.

CTO Conrad Trautmann noted that REC Networks estimated that some 1,400 stations have a path to upgrade to Class A10. He thinks a new class would harm stations that may otherwise be able to increase their facilities within their class or relocate for reasons such as damage to a tower or expiration of a lease.

And citing earlier comments about C4 from iHeartMedia, Trautmann wrote that a Class A10 "would contribute to the evolution of the crowded FM band into many small and interference-ridden signals rather than high-quality services, that is, the 'AM-ization' of the FM band."

REC Networks gave conditional support to the idea. It wants the FCC to pair A10 with an LPFM power increase proposal as part of an "expansion of rural broadcasting." REC, founded by Michelle Bradley, is a consulting and regulatory advocacy firm. It conditioned its support on advancing A10 with REC's Simple250 petition to a notice of proposed rulemaking as a combined proceeding. Similarly the organization Common Frequency opposes A10 but "could be swayed" if the FCC simultaneously considered measures for LPFM licensees to address interference and displacements, such as LP250 and "last chance" migration to Class D service upon displacement.

You can read our stories about these comments at *www.radioworld.com/tag/class-a10*. Or read the full filings and others at *www.fcc.gov/ecfs/*. Enter 24-183 in the "Proceeding" field.



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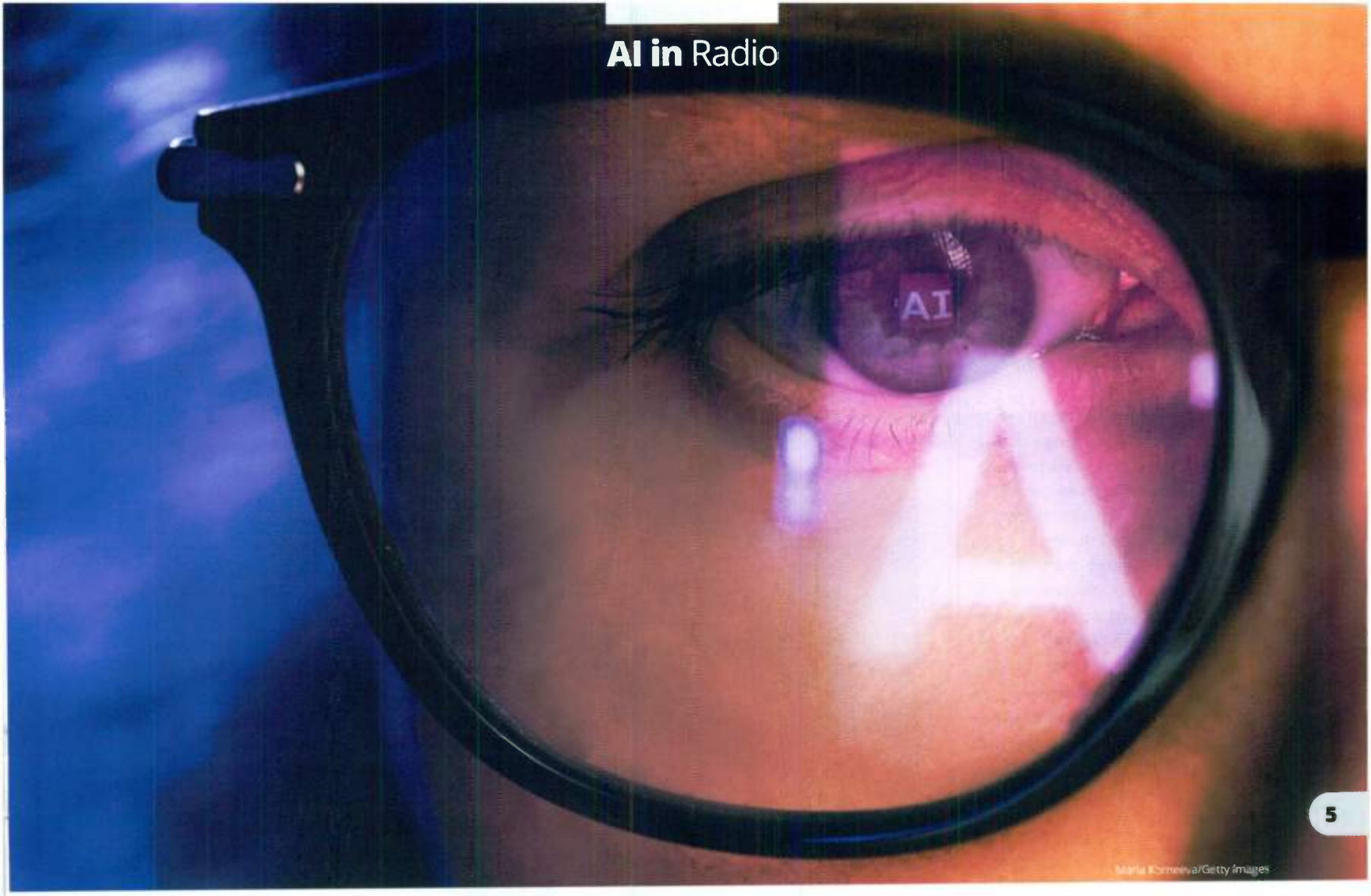

Maria Korneeva/Getty Images

Writer
Randy J. Stine

The author wrote in July about upcoming regional broadcast conferences.

Chris Brunt gives Jacobs Media its AI Edge

The new world of artificial intelligence presents opportunities for broadcasters

We live in an AI world now, but though the trend has made plenty of headlines, Chris Brunt thinks we might be surprised to learn just how many radio broadcasters are already using AI in their workflows.

Brunt is director of AI, digital and revenue generation at Jacobs Media, which he joined last winter. He sees the development of AI technologies as a natural stepping stone for broadcasters. We're surrounded by AI applications that can perform more and more of the tasks needed to create radio, and experts like Brunt see the industry edging closer to content generation that can be trusted and integrated into day-to-day workflow at stations.

Brunt's broadcast background in digital roles at Beasley Media and Greater Media provides him insight on using AI in a radio environment. Jacobs Media President Fred Jacobs said of him, "Chris is like the 'Swiss Army Knife' of digital – he's a revenue generation expert, and he understands everything from programming to programmatic."

Brunt writes a newsletter for Jacobs Media called "The A.I. Edge." He's also in demand at regional and state trade shows. He'll give presentations at the Nebraska Broadcasters Association's convention in August and a Michigan Association of Broadcasters leadership conference that same month.

Radio World him Brunt about the industry's AI-influenced transformation and whether AI can help lift radio to greater relevance for radio listeners.

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Should we be surprised at the rapidity with which broadcasters are adopting AI?

Chris Brunt: No. But from what we are seeing from our clients and across the industry, there is still a wide spectrum of AI usage. There are clusters of stations where use of AI is minimal, but there are other groups where it is widespread. There might be places where there is a no AI policy and employees are using it on their personal devices. It's all over the board and hasn't coalesced; there is a lot of curiosity and a lot of opportunity.

Audacy and Beasley have been open about using AI to assist with workflow. Is it safe to say that all of the major groups are using it in their workflows in some form?

Brunt: It depends on a company's corporate policy and the legal guidance it is receiving, but usage doesn't seem to be contained to just the large broadcasters. AI usage doesn't appear to be limited to large- or small-market broadcasters, given the proliferation of the technology and low price point of some of the tools, with some of it even being free. We're seeing programming and sales staff using generative text service to create copy and create a spot or use it for imaging.

There are AI tools for so many purposes now. How do you suggest stations approach their use?

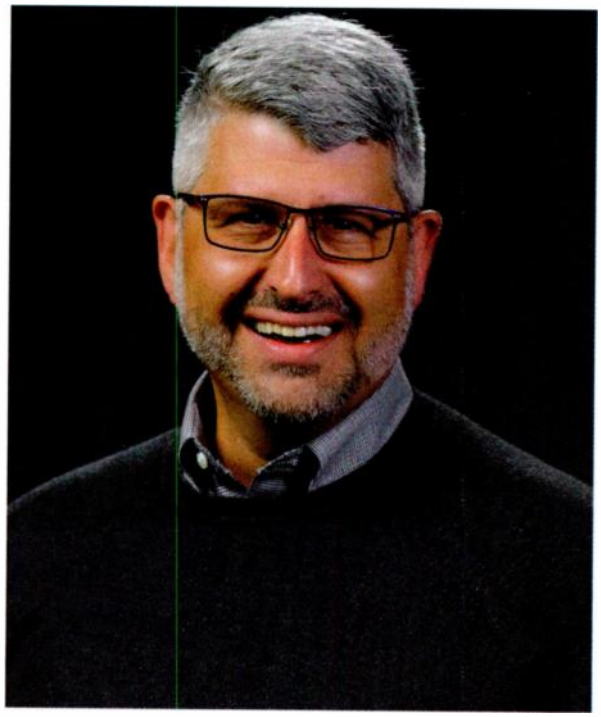
Brunt: If a broadcaster isn't using AI at all or has no official policy, they need one. Our recommendation is to start purposely but judiciously. They have to figure out what tools are the lowest risk and figure out what you want it to help with. Is it brainstorming a spring promotion or do you want it to help write commercial copy?

Companies need to implement AI training for employees so that they can not only become skilled in the tools that will accelerate their growth and productivity, but also so they know the risks that come with the unbridled use of the technology. You want to make sure the tools you are using are not going to divulge confidential information about the station or a client.

We know that across all industries — not just broadcasting — employees are experimenting with AI regardless of their companies' AI policies. So it's important that employees know those risks, which include potential use of uploaded data for the training of AI models, copyright and intellectual property issues, and hallucinations that could disseminate false information.

On the Edge

You can subscribe to Jacobs Media's The A.I. Edge newsletter at *jacobsmedia.com*.



Above
Chris Brunt

Broadcasters also need to make sure that if they are using AI for creating on-air content, it needs human eyes on it to make sure the content it isn't hallucinating and disseminating wrong information or at worst harmful information.

It's easy to understand why the unlimited creativity aspect of generative AI is so intriguing, and as you mentioned the entry price is relatively low.

Brunt: That is correct. An ElevenLabs voice subscription is pretty cheap. When a production director has copy coming in late on a Friday and you need a female voice and none is available, you can use ElevenLabs and get a decent spot.

There are AI platforms for writing and even reporting news. There are certainly legal implications to using AI. Should its use be labeled?

Brunt: We are seeing that happen now with social media platforms tagging AI content. There is the back and forth between the FCC and the Federal Election Commission about having broadcasters label political ads if they are AI-generated. There will be a lot of discussions among the lawyers over this and hopefully broadcasters won't be caught in the middle.

However, there will be a growing acceptance level with AI and broadcast. Based on our research and Jacobs Media Techsurveys, listeners are becoming more aware and more open to AI. The relationship radio has with its audience its incumbent on them not to mislead them.

That brings up the transparency issue.

Brunt: Those radio stations using an AI Ashley or an AI Allie are being careful to label them as such to preserve their relationship and authenticity with their audience.

We recommend to our clients that no piece of AI content gets distributed without human eyes on it before hand. There is such a broad spectrum of AI usage now. If you have an AI voice on the air that is completely synthetic, that is completely different from using AI as a prompt to write some commercial copy.

You spent a number of years in programming and digital sales. How does that help you in this job, dealing with AI issues?

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Back in BLACK

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Brunt: It helps to know the pressure program directors are under to create great content every day. Everyone is wearing a lot of hats and there is pressure to deliver a good quality product. AI is going to help improve the product through better research and enhanced content.

You blogged recently about the impact Apple Intelligence could someday have on radio.

Brunt: Yes, when you analyze where Apple is going with its AI, when AI hits all of these iPhones, you can imagine what it might be like. AI is going to be integrated and seamless across all of the Apple native apps that will become a part of everyone's lives. Radio can learn from that and how they are approaching concerns over privacy.

Broadcasters will be able to use the technology for salespeople to prospect and prioritize their workload. I think we will see a complete overhaul of the workflow in the business world and that will include the radio side.

> **If a broadcaster isn't using AI at all or has no official policy, they need one.**

Ultimately, how beneficial will AI be to broadcasters?

Brunt: I think it is going to give broadcasters a chance to create more custom content for audiences, and more custom targeted ad campaigns for clients. That's the ultimate scenario.

Clearly customization of content will be a key development. Similar to how NBC/Peacock used AI this summer at the Olympics to customize its highlight coverage using the voice of Al Michaels. It's "AI Al" coming to your phone and tablet with sports highlights. The use of AI to clone voices and likenesses is the next big thing. Radio can be at the center of that and use it to deepen its relationship with its audience. That could raise its visibility in the media landscape if the industry can get it right.

Obviously the growth rate for AI is increasing quickly. I think it is going to be important for everyone to at least have some curiosity about AI and to keep learning about it. If you are not following it closely or using it, you can bet the competition will be. And competition goes beyond other broadcasters.

This competition is self-service Facebook platforms, and self-service Tik Tok advertising platforms, and the digital realm. The expectation is that most everyone is going to be using AI if they are not already.

Learn more about how radio stations are deploying AI tools in the Radio World ebook "Artificial Intelligence in Radio" at radioworld.com/ebooks.

Newswatch FCC Moves Forward on AI Disclosures

The FCC is moving forward on a plan to require broadcasters to identify political ads that include AI content, a priority for Chairwoman Jessica Rosenworcel.

In July the commission voted along party lines to open a notice of proposed rulemaking. It said it is not proposing to ban or restrict the use of AI-generated content in political ads. But broadcasters would be required to use standardized language in on-air disclosures.

CoreDesignKEY/ Getty Images

"For radio ads, we propose that broadcasters provide an on-air announcement orally in a voice that is clear, conspicuous and at a speed that is understandable, stating that: 'The following message contains information generated in whole or in part by artificial intelligence,'" the FCC wrote.

In his dissent, Commissioner Brendan Carr, the senior Republican, said the Democratic majority was trying to alter the regulation of political speech fundamentally and that the effort was unlawful.

"This is a recipe for chaos," Carr wrote. "Even if this rulemaking were completed with unprecedented haste, any new regulations would likely take effect after early voting already started. And the FCC can only muddy the waters."

The commission says its proposal seeks to bring uniformity to a patchwork of state laws that govern AI and deepfake technology in elections.

The Federal Elections Commission is also considering whether to prohibit deliberately deceptive AI-generated content in campaign ads. But the FCC noted that the FEC does not oversee television and radio stations.

— Randy Stine

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John Bisset
CPBE

The author is in his 34th year of writing Workbench. He handles western U.S. radio sales for the Telos Alliance and is a past recipient of the SBE's Educator of the Year Award.

Send your tips

Workbench submissions are encouraged and qualify for SBE recertification credit. Email *johnpbisset@gmail.com*.

Do these things on every site visit

Put those five senses to work as you walk in the door

What items are important to check whenever you visit a transmitter site?

Systems engineer Ihor Slabicky in Rhode Island reminds us that as you arrive, you should inspect all gates, fences, locks and door locks before opening them. Make sure your locks are in place and still locked.

Has someone been fiddling with your combination locks? You may be able to tell at a glance if you have been in the habit of resetting combinations after each visit to 0-0-0-0 or some other set pattern that isn't the actual combo.

Now look for signs of forced entry, such as scratches, scrapes or cut marks around doors, windows or locks.

Check the outside of the building and tower, watching for equipment that may have fallen off the building or tower. Look for loose or sagging wires or cables, as well as debris that may have fallen or blown in, such as tree branches or plastic bags.

Is the fence in good repair? Has brush grown up around the tower?

When entering the building, try to do so quietly. The sound of the door may startle small "uninvited guests" inside; they may freeze and scamper off. If you enter quietly you may have enough time to spot them and see where they go to hide.

When you enter the building, also take a good sniff or two. Your nose may pick up normal electrical smells or whiffs of burnt electronics and insulation.

Scan the room to make sure everything is in its place. Check the

Right
Brush doesn't grow up overnight. Remove vegetation when it starts to grow.

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floor for mouse droppings. A brief "inspection" will tell you a lot, in a short period of time.

Ihor's suggestions focus on the use of our senses — not only sight and smell, but also sound. Do you hear anything out of the ordinary? Is a piece of equipment beeping to indicate low battery? Is a fan bearing squeaking due to lack of lubricant?

Unusual sights, sounds or smells in a transmitter room can help uncover and localize problems or issues that may have come up since the last visit.

Above
Heliax buried in a sand-filled trench. What could go wrong?

Above right
Termites lunched on the Heliax jacket.

Mountaintop moments

Technoguy Michael Baldauf visits transmitter sites in the mountains of Colorado, where pine trees get large. Their needles can be blown and scattered along the coax as well as on the ground around the tower. Clear them!

If you have a backup key hidden somewhere, check that it's in place. Nothing is worse than snowshoeing to a site only to find you can't get in the door. A hidden key can save a lot of time and trouble if the utilities or Forest Service call and need access. It might also save a life if someone needs shelter in a blizzard.

Check your coax pressurized line gauges. They're often located next to a compressor in some corner or high up on the transmission line, not readily visible.

Finally, Michael recommends that you develop and print out a site checklist for each site you maintain. Broadcast engineers have a lot on our minds these days so take a tip from the people who fly airplanes: A printed checklist ensures nothing gets missed. It can also help someone who is assisting you and doesn't know the site as well. A checklist can ease some of the stress of visiting a remote site.

What are your own suggestions of the key things to check whenever visiting a site? Email me at *johnpbisset@gmailcom*.

Cable cuisine

Sometimes problems are invisible yet right underfoot.

Contract engineer Ted Fuller in North Carolina had to re-route a length of half-inch Heliax transmission line that was buried in a sand-filled trench in the concrete floor of a transmitter building. As he unearthed the line, Ted noticed it was caked with termite dirt. Only as he scraped away the dirt could he see that much of the plastic jacket had been eaten, exposing the copper!

> **When you enter the building, take a good sniff or two. Your nose may pick up normal electrical smells or whiffs of burnt electronics and insulation.**

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Make your tower site more secure

Cloud-based technology brings new monitoring and control capabilities

Writer

Ty Magnum
Operations & Engineering, Joda Media

Lockboxes, padlocks, keypads or handing out copies of keys have been traditional methods of security at broadcast facilities, but they no longer have to be. Technology exists that can bring enterprise-level physical security to any tower site.

Joda Media offers one version, and I'm working to raise awareness of the benefits of such systems in terms of security and control, especially at sites with tenants or that are at a higher risk for theft or vandalism, such as those near public spaces like hiking trails.

Until recently, the only option for physical security was expensive, multi-door systems of the type used in schools, warehouses and office buildings, where dozens of doors and cameras are managed.

It is impractical and cost-prohibitive to install one at a transmitter building; the cost of having a security company install all the necessary equipment — server, controller, fob reader and camera — for one door is considerable. While I'm sure it is done at some sites, the installation, maintenance and administration costs of a separate security system for each transmitter site can be costly.

In the absence of cost-effective and user-friendly physical security technology, the broadcast industry generally has resorted to other means of controlling access to their tower sites. But the options create as many problems as they solve.

Padlocks and lockboxes bring liability as much as security. I can walk into any hardware store and find an array of hand tools with which to dispatch a padlock or lockbox; you can watch a video of me doing just that with my tool of choice, a $25 sledgehammer, at *www.jodamedia.com/lockbox*.

If you put the key to your building in a lockbox or rely on a padlock as your line of defense, you are practically handing the key to any miscreant who comes to your site. And lockboxes, padlocks and keypads have no sensors, connectivity or other means to set off an alarm, make calls, text/email, etc. in the event they are tampered with or destroyed.

Also, too many companies set all of their combinations to the same digits at every site or (worse) have the combinations set to the publicly available frequency of the station. A hand tool might not even be necessary.

More Info
www.jodamedia.com

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I've heard countless stories of engineers and other staff visiting a site only to find that the previous visitor had locked the padlock daisy-chain incorrectly, bypassing the lock, or finding the key missing from the lockbox, or that the locks had been changed and their own key no longer worked. I've heard stories of using lighters to unfreeze the dials of a lockbox, of vandals spray-painting obscenities on new solid-state transmitters or pouring soda into processors. Who wants to drive halfway across a state just to hand someone a key? Keys that can be copied, codes that can be shared, I could go on.

These sites lack protection, monitoring, logging, reporting or administration capabilities, not to mention convenience.

A good fit

I was born and raised in radio; I've been going to tower sites and transmitter buildings for as long as I can remember. In recent years, my company has been working with schools and businesses to upgrade IT and security infrastructure at their buildings.

When I learned about cloud-based physical security, I immediately thought of tower sites. How cool for a broadcaster to be able to have a couple hardware components at each site and then seamlessly monitor and manage all their sites, in real time, from a central location (or anywhere else) via a phone or browser.

Cloud-based hardware means that there's no longer a need for an expensive, physical server or big, multi-door controllers. This hardware uses built-in cloud functionality, needing only an internet connection to communicate with a server in the cloud.

Instead of expensive controllers, there is now a single-door controller: a compact, efficient unit that can handle all the relays and sensors for one door. Plus, cloud hardware allows for video to be built into the fob reader, making a fob reader and camera all in one.

Above
The author demonstrates how easy it is to break open a lockbox in this still from an online video.

The system can be cost-effective for small buildings, requiring only two pieces of hardware — the reader/camera and the single-door controller — while delivering the robust security features of large, multi-door physical security systems.

User access and management can be done from any phone or browser. Sensors can sound alarms and call/text/email in the event of tampering, break-in or a door left ajar. Real-time logging and reporting can help manage sites and verify access events. Doors can be unlocked from anywhere with a click. Single-use, digital keys can be texted or emailed to contractors so they can access sites as needed.

The field of cloud-based physical security is exploding, and various consumer- or enterprise-grade systems are available, for DIY or professional installation. My company, Joda Media, has made a few enhancements, plus the necessary shields from RFI, and has a system that is designed for broadcast transmitter facilities, and we are introducing it to the U.S. broadcast industry. While we offer Motorola's Avigilon Alta suite, which we feel is the highest standard for this type of technology, there are many good systems out there. I'll be discussing our system, examples from other manufacturers, how to install them, best practices and more at the Midwest Regional Broadcasters Clinic in Madison, Wis., in September.

If you're looking to streamline tenant access at your site, if you have a high-value/high-risk site or are simply looking to upgrade convenience and control, consider cloud-based physical security.

Ty Magnum has spent his career in radio and television, working in traffic, production, promotions, engineering and IT. He is working on a patent for a cloud-based virtualization system for radio.

> **"I've heard countless stories of engineers and other staff visiting a site only to find that the previous visitor had locked the padlock daisy-chain incorrectly, bypassing the lock."**

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WHAT'S MISSING FROM THIS STUDIO?

Without a CE onsite, Lotus Seattle leaned heavily on AoIP intelligent networking by Wheatstone, project management by SCMS, and system integration by RadioDNA to build out new studios in a few months.

Intelligent AoIP Networking by Wheatstone

AT A GLANCE

Challenges

- Engineering Shortage
- Tight Deadline
- Turnkey Studios for Four Major Market Stations

Benefits

- **Easy Implementation in one AoIP environment:** Four on-air control rooms, two production rooms, a voicetrack studio, and a news desk with three editor positions easily share elements and workflows.
- **Smart Use of Virtualization:** Touchscreens replaced hardware. Combining Blade utility mixers, I/O and WheatNet IP scripting created powerful new workflows.
- **Remote-in Engineering:** The WheatNet IP studios are accessible remotely for regular maintenance and occasional troubleshooting by RadioDNA or other Lotus engineers.

Project Management by SCMS

System Integration by RadioDNA

Every single bit of this is first class. It's the best and most advanced studios we have in the company. —**Jason Houts**, Lotus DOE

Lotus is a privately owned group with 48 radio stations in 10 major U.S. markets, with several using WheatNet IP for audio networking.

Photos provided by RadioDNA

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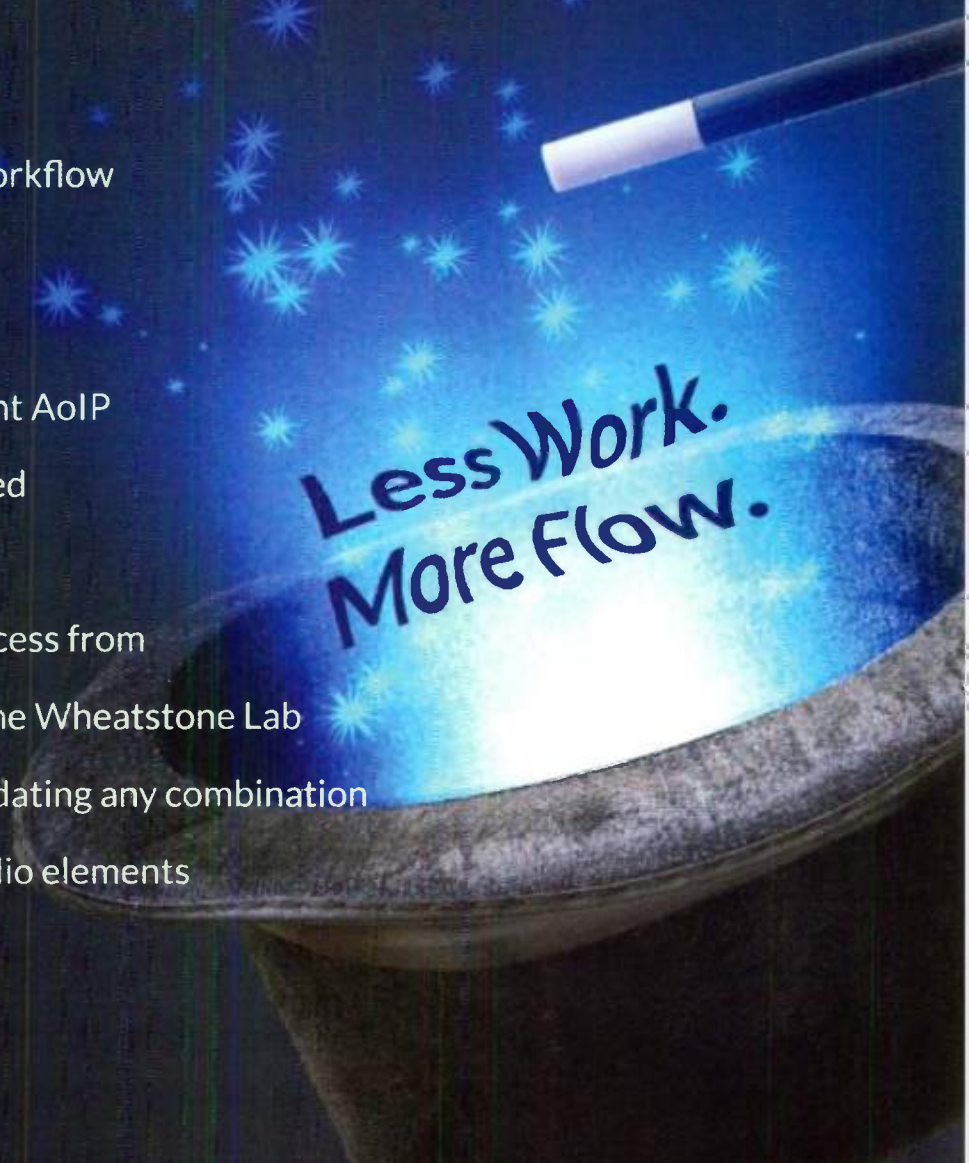

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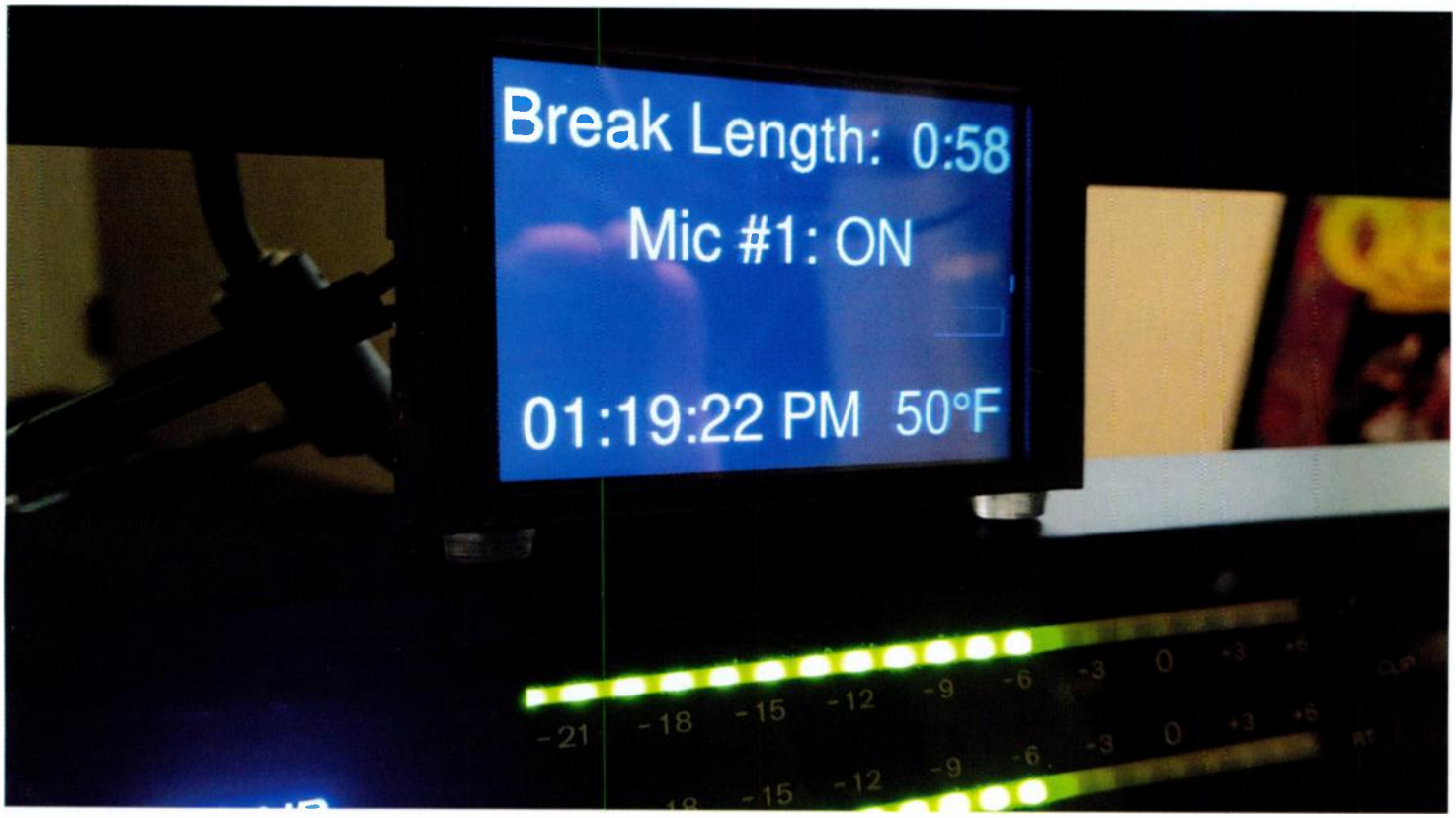

Writer

Burley Stapley
Corporate Chief Engineer, Blanchard River Broadcasting

A DIY project with some help from ChatGPT

Craft a studio talk timer with Python and Raspberry Pi

Are you looking to add a nifty talk timer for your on-air people? Well, grab a cup of coffee and join me on a journey of tinkering, coding and a bit of ChatGPT magic as we create a Python script and graphical user interface to monitor how long a jock has been gabbing away on the air using a Raspberry Pi and a little bit of code all neatly packaged in a metal enclosure.

Above
The finished project in the studio. The TFT display is large and in charge.

Keeping jocks on track

The consultant for our classic rock station, WBUK "106.3 The Fox" in Ottawa, Ohio, suggested to our morning show jock that they monitor the length of time they are talking on the air so that his on-air engagement doesn't go on too long.

The problem was that our Audioarts Air4 console does not incorporate a built-in counter/timer like some of the old-school consoles that have the LED displays. A straightforward timer triggered by the console's microphone "on" logic was the solution we envisioned. But how do we turn this idea into reality?

Raspberry Pi to the rescue

My first idea was to use an Arduino microcontroller along with a standard 16x2 LCD display sourced from the many retired Starguide satellite receivers we have laying around.

The Arduino was simple and down and dirty but the 16x2 display just wasn't big enough. The trusty Raspberry Pi seemed like the next logical choice due to the plethora of larger displays which it supports. Its GPIO pins could easily interface with the studio console logic, and with Python, we could create a user-friendly timer display.

I sourced a Raspberry Pi 4 from Mouser Electronics (*www.mouser.com/*) and a metal enclosure that came with a 480x320 TFT touchscreen display (Mouser part numbers are 358-SC01939 and 426-FIT0820 respectively).

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With the Raspberry Pi in hand, I dove into the world of Python scripting. (For info about Python visit *https://www.python.org/*.)

I started by experimenting with GPIO to detect the state of the microphone input logic and it seemed easy enough to get the console's dry contact closures to look like a 1 and 0 to the RPi via a little bit of Python coding. Soon enough, I had a basic script that would recognize when the jock had turned "ON" the mic and would start an elapsed time count on the TFT display. The timer would also pause the count when the mic was toggled to the "OFF" position, allowing the jock to see the length of their on-air time. The timer would reset and start counting again as soon as the mic input "ON" button was pressed again. All is good!

However, creating a graphical user interface proved to be trickier than anticipated. My initial attempts left me with a rather bland interface that lacked the finesse I was aiming for. This is where ChatGPT became my companion in code.

ChatGPT's guidance

I turned to ChatGPT (*https://chat.openai.com/*) for assistance in building the final GUI. Describing my vision and challenges to the AI's chat interface, I received some pretty good insights.

ChatGPT suggested using Tkinter, the standard GUI toolkit for Python, and with the AI's guidance I was able to have a functional timer display very quickly. But a GUI is not just about looks; it's also about functionality.

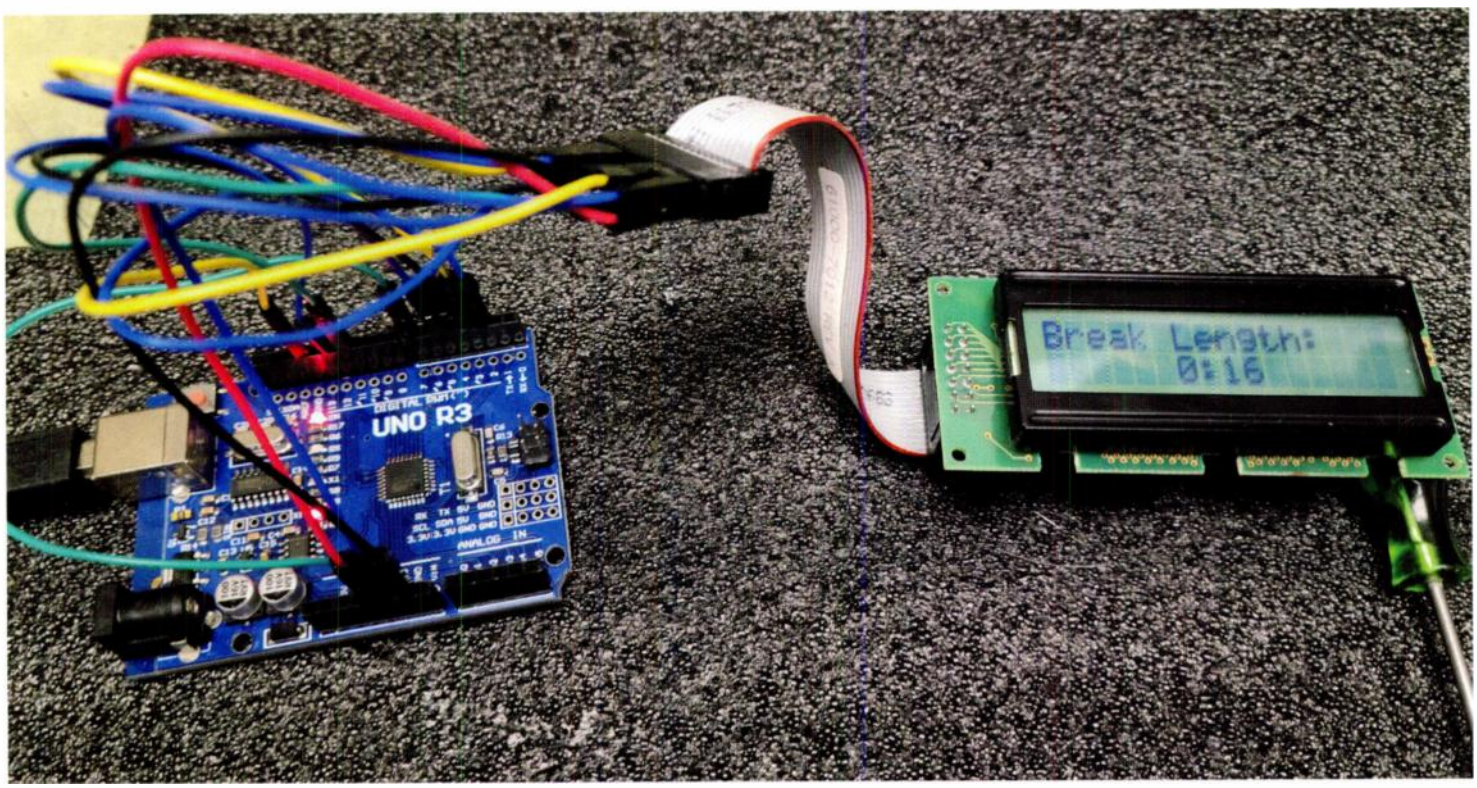
Integrating threading into the script allowed for real-time updates of the break length. This made the timer responsive, ensuring jocks always had an accurate reflection of their airtime. I also added a "Quit" button that was just barely visible on the GUI. I didn't want to make it too easy for a jock to close out of the GUI and be presented with an unfamiliar operating system's desktop. That might be inviting disaster!

Once the timer portion of the project was tackled, I thought of the adage "...all that, for that?" It seemed like overkill to use all that much computing power for just a timer!

The next logical question was, "What other information would on-air people want at their fingertips?" Well, time and temp of course.

Below
The Arduino's small 16x2 display pulled from a Starguide receiver. Too small for my older eyes!

> **"I didn't want to make it too easy for a jock to close out of the GUI and be presented with an unfamiliar operating system's desktop."**



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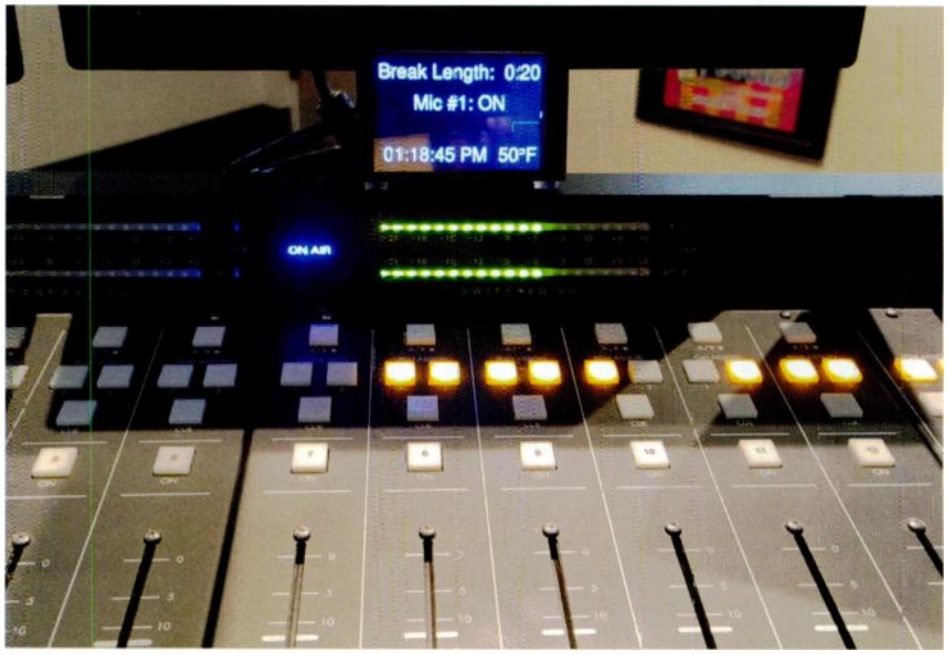
I asked ChatGPT to modify my code to add in a weather API that grabs the current temperature in our city from the internet and then update the temp data every few minutes. I also tasked ChatGPT with adding the current time including resolution down to the second.

The weather API required signing up for a free service to get access to the online data and also to create an API key to get my location's current weather data to my RPi. ChatGPT was helpful in figuring all this out, including how to get the code to retrieve the API data.

After several iterations, the Python script evolved into a robust talk timer GUI. The UI was visually appealing, the functionality was seamless, and the unit offered a somewhat look of "cool" to the classic rock studio thanks to the 480x320 TFT display included with the enclosure.

ChatGPT played a pivotal role in refining not only the code but also the overall user experience. It guided me through UI design choices, provided tips on improving code efficiency, and even directed me in the implementation of the API for the time and temp feature.



Above
This view gives you a sense of the scale of the finished project.

Conclusion

In the end, crafting this Python script was more than just coding. It was a journey of learning, experimenting and leveraging the collective intelligence of ChatGPT. The collaboration added a dynamic, creative element to the process, making it an adventure in problem-solving and innovation. My back-and-forth conversations with ChatGPT became a collaborative effort, pushing the project beyond what I'd envisioned. While have some programming experience, I have very little with Python.

The total cost of the project was around $80 and it took about four hours of my time, so not too shabby for a custom-built unit that fills a need for one of our morning shows.

You can see the code discussed in this article at *github.com/burleystapley*. Click on "talk timer" and "Arduino talk timer."

An Audacy AM Makes a Move in Houston

In 2022, when Audacy sold the tower site of Sports Radio 610 KILT in Houston, the sale brought in a reported $15.6 million but necessitated a fresh approach for the station's infrastructure.

KILT operated on four towers at the old site, called West Road. The company applied to relocate to a site about six miles away at Welcome Lane, with modified directional antenna patterns and diplexing on the existing 11-tower array used by Salem Media Group's KNTH(AM). KILT also would decrease power, in part to meet concerns of Mexican authorities.

KNTH uses nine towers by day and 11 at night. Audacy Regional Director of Technical Operations Armando Gonzales said the KILT system will use five of those towers in daytime and six at night. "We also designed non-directional operation on three of the six towers for emergency operation."

Hatfield & Dawson were the consulting engineers. Phasetek Inc. provided the tuning, phasing, detuning and ATU cabinets. Work is nearing completion on the project.

This is one of nine case studies in Radio World's latest ebook, "Awesome RF Buildouts." You can access it for free at *http://radioworld.com/ebooks*.

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World Radio History

Writer

Nick Piggott
Project Director, RadioDNS

Radio's evolution progresses, but we need to keep up

Voice control is a good example of why we need to think beyond audio

I recently presented at the WorldDAB Automotive Event on a subject that I don't think any station manager or technical manager would ever have considered just five years ago.

I started with a familiar opening: the evolution of radio from its first days in vehicles. How easy it was for broadcasters, who just needed to broadcast a single, mono, audio channel on an AM frequency. As technology has evolved, the capabilities of vehicles and broadcast radio have evolved: FM, stereo, RDS. Each step has moved the experience forward, kept up with listener expectations, and demanded more competency and coordination between broadcasters and manufacturers.

I noted that, sadly, more than 40 years after its development, some radio stations aren't able to use RDS correctly.

The arrival of digital radio demands more capability and competency: text information, album art, logos. These are baseline expectations, as fundamental as transmitting (stereo) audio without distortion. Connected vehicles are beginning to demand more again: larger screens, a larger array of media choices, personalisation, voice control.

Voice control was the subject of my presentation.

Think beyond audio

It's necessary to explain to both broadcasters and manufacturers why "out of the box" voice assistant functionality just won't work well for radio.

Listeners refer to their favorite radio station in ways the marketing team would never want to formalize; brand teams create radio station names that look clever, but completely confuse voice assistants ("NRJ"?).

The arrival of voice control into vehicles is an inevitability, as the complexity of vehicles goes beyond what can be delivered safely through a touchscreen interface. Will radio stations understand that they need to provide the right information to help voice assistants navigate drivers to their stations, or will they ignore (or try to abuse) it, as has been the case with technologies like RDS?

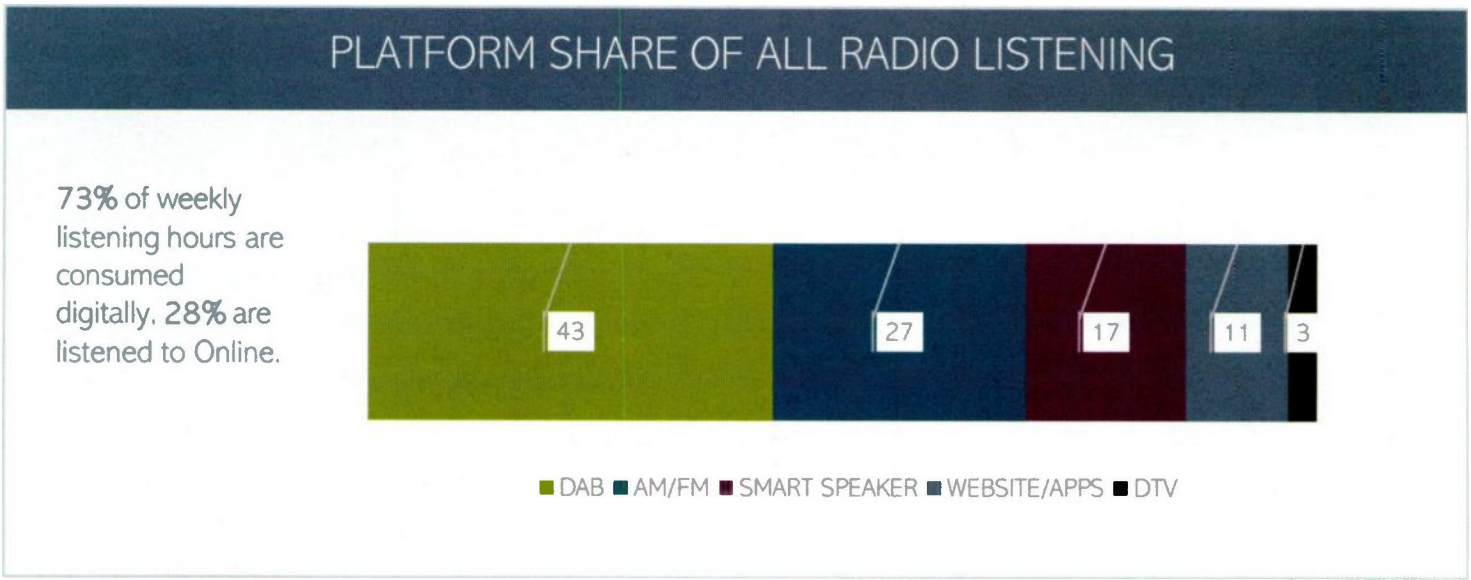
If a few stations miss the boat, the problem is theirs; if the industry misses the boat, everyone will lose listeners.

Voice control is a good example of radio needing to do more than "just audio."

"Just audio" is not even table stakes in this vehicle media environment. Stations need to make sure that every station is accompanied with deep, accurate, metadata, and that technical standards are followed properly. Nothing will annoy our colleagues in the automotive industry more than them investing millions in developing functionality to see radio stations misuse or disuse it.

There are no insoluble problems in this space. It needs stations to decide to act; any station can do really high-quality visual content, any station can get their station logos correct. The technical standards and off-the-shelf solutions exist. When deciding where to route investment, maybe a

Below Infographic on share of digital radio listening in the U.K.



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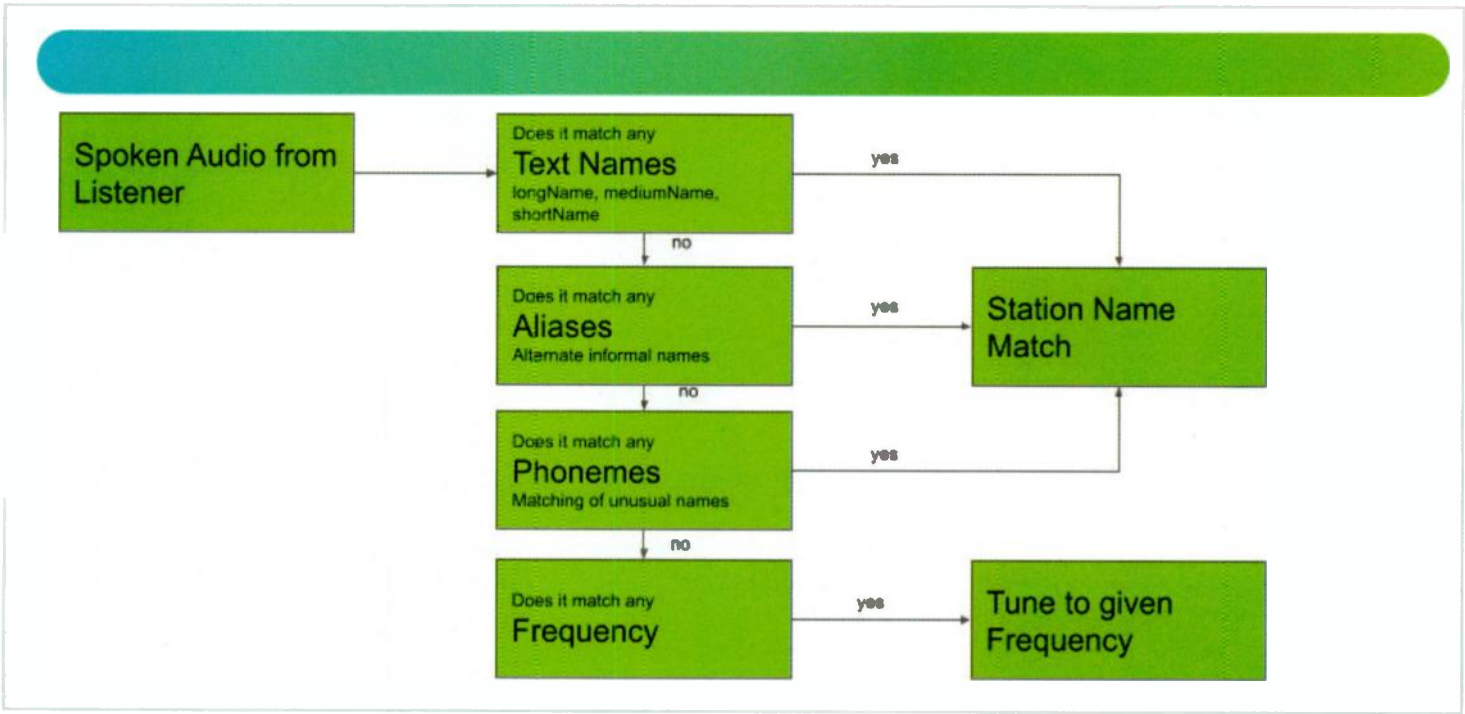

Above Flowchart of how voice matching for radio stations should work in vehicles.

little less outdoor pays for a much better presentation in the vehicle?

Voting with their dials

We must acknowledge that the automotive industry moves slowly. It can take a few years from committing to a new function to that function appearing in vehicles on the roads.

That's a difficult argument to make against the apparently instant returns of investing in apps and above-the-line-marketing. But it's strategically vital to protecting the vast amount of in-vehicle listening that happens in every market.

The digitization of radio is proceeding at different speeds in different markets. The E.U. and U.K. benefit from governmental mandates that require DAB digital radio to be installed in all passenger vehicles, which in turn makes broadcasting digitally as attractive as any other format.

Listeners are voting with their dials; in the most recent U.K. audience survey, analog (FM+AM) share of listening was just 27%, continuing its decline. AM radio is nearly extinct in Europe, as stations previously on AM have found new homes on DAB.

The cost of broadcasting digitally is going down, through use of open standards and generic hardware. What used to cost £/€250,000 now costs £/€25,000, because that's what happens with technology. The success of "small-scale licensing" of digital radio in European countries shows what's possible.

Those new cost points are encouraging more countries to look at the benefits of digital broadcast radio, in Africa and Asia. Thailand's regulator, NBTC, has launched a nationwide relicensing plan based on DAB+, as a way of bringing more radio stations more reliably to the country. Ghana has launched trials of digital radio, adding another African country to the list of trialists and providers of digital radio on the continent.

Analog and digital radio will coexist for some time, in different proportions in each country. Hybrid radio is a part of both analog and digital radio now and is already being built into connected vehicles.

Beyond "service following"

When we talk to people about hybrid radio, the feature that many radio people instinctively understand is the ability to switch audio automatically between broadcast and IP, allowing uninterrupted listening (almost) regardless of location.

It's easy to understand how that supports TSL. It's in production vehicles in Europe and North America today, from brands like Audi and VW, and it's quite remarkable how seamless the transition is.

But the "hybridization" of radio has far more value in it. As a direct result of putting in standards for hybrid radio, tens of thousands of radio stations now provide essential information in a standard format that any vehicle can use. That may not be as easy mentally to convert into TSL, but it does.

It's that information that keeps radio not just present but prominent in vehicles. It's one thing to have a radio built into millions of vehicles, but if nobody likes using it, it's a waste of time and money.

World Radio History

The vehicle dashboard has attracted the attention of Google and Apple. Drivers want to bring their digital worlds, which they have committed to their iPhones or Android phones, and Siri and Google Home and Alexa, into the vehicle. It's not yet clear how much territory automotive manufacturers will cede, and it's clear there's still ebb and flow happening, such as GM's announcement to pull back from both platforms.

Regardless, broadcasters can provide "apps" for cars in the same way that they provide "apps" for phones. Those apps offer, demand or require the driver to "log in", and provide access to audio beyond just linear radio (even if that linear radio might be subscription based and ad-free).

Incumbent broadcasters would be smart to promote and push broadcast radio as the "gateway" to their app experiences. Even the busiest broadcast dial — more than 100 stations in some DAB markets — is significantly more navigable than an app store or generic streaming radio app. It's complex and continually expensive to secure prominence for apps in dashboards, either through marketing to listeners to help them find the app, or by having it pre-installed. Every vehicle will have a "Radio" app, we just have to make sure it's top-level and heavily used by listeners, which means making it good — really good. And that means getting the new basics right: the audio, the text, the logos, the visuals, the voice recognition.

The newest functionality being standardized by RadioDNS intends to provide a simple bridge between the "radio app" installed in the car and a broadcaster's own apps. It creates a logical and seamless journey for the listener from live radio into exploring on-demand content via broadcaster apps.

It's the first attempt at personalization for broadcast radio — "If you like this live radio show, then can we recommend you give these podcasts (on-demand audio) a listen?" It's a guided introduction, rather than being dropped into the deep end of exploration. It will prompt the listener to install the app on their first journey, and after that, the app stays installed. It's simply a great way to get your radio station app installed in a car, starting from the live radio station. All you need to do is provide the right information in the right standardized format.

All of this happens when radio stations prioritize more than just the audio output. It's not sufficient to leave it all to the techs to do. The pace of radio's evolution is set by the competing media that our listeners use every day, and we need to step it up. The standards, organizations and solutions exist to make it happen, but it has to start with radio stations deciding they want to stay the first choice for their listeners, not the least-worst.

More Digital

This article is excerpted from the free ebook "World Digital Radio." Read it at *radioworld.com/ebooks*.

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Things we learn the hard way

Here are my ideas; please share yours

Writer

Michael Baldauf

The author wrote in May on "How Not to Build a Transmitter Site."

There are many things a broadcast engineer learns from direct experience. You won't find most of them in a book. A few of mine:

- Putting a big roll of coax in the back of a little pickup affects your ability to steer around switchbacks when going up a transmitter road. Those front tires need some weight on them.
- No matter how much you may swear, you still must drive back to the transmitter site to throw the switch to put the transmitter back into remote control.
- Devices that trigger on pulses to ground need to have a ground to pulse to.
- AM antennas located in auto junkyards radiate much better without chromed bumpers shorting the tower to ground. (How they got that over the fence I will never know.)
- The moment that you realize you don't have keys to the transmitter building is after you've already made the snowshoe trek into the site. Check first or hide a spare on site.
- A properly maintained lightning gap at the base of an AM tower will attract insects at the most inconvenient moment.
- When the question is, "Should I stop here to use the restroom or hope there's another one somewhere ahead," the answer is to stop here.
- An engineer who does not carry toilet paper has never

World Radio History

made a bandage from TP and electrical tape.

- Never call up your engineering associate at 3 a.m. to ask why the FM exciter audio is playing on the SCA and not on the air. Just move the cable from SCA to composite input. (When he asks you the next day whether you really called him or if he'd been dreaming, you might not be able to lie your way out of it.)
- Contact cleaner and WD-40 are NOT interchangeable.
- Things that are NEVER funny: Lightning. Snakes and rodents. Not being able to find the tweaker screwdriver to finish calibration.
- Radio Shack is out of business. If you are in a small town and do not have it with you, there's no place to get it short of knocking on a random door.
- Alligator clips and wire seldom correct problems in digital devices.
- Never look a gift horse in the mouth ... but don't buy a cheap used transmitter without serious investigation.
- Always tell the station manager the truth, in conversation and in writing, even if it is not what they want to hear. They will come to respect your honesty even if they don't like your expenditures.
- Clip leads with a coating of dust on them are an indication of a temporary fix that has been around way too long.
- If you are working for a station that funds a drinking fountain but cannot afford parts for the transmitter, stop.
- Which is more dangerous to reach your hand into: a bag of rattlesnakes or an old high-power FM transmitter? Answer: Don't try either unless you really know what you're doing.
- No matter how many times they are told not to, air talent will bring drinks into a control room. Some will bring watermelon on a paper plate and drip it into the ventilation holes of an on-air computer. You can clean a CPU and socket with contact cleaner and get back on the air.
- If the station has been off for more than 10 minutes, the listeners are gone. Racing to the transmitter site and risking yourself to save a few minutes of downtime is unnecessary. Ignore the pressure from others and concentrate on solving the problem. No matter how long it takes to get back on, everyone will be happy when it is. If your station has done its job, your listeners will be back. After that, push for whatever is needed to reduce the possibility of the failure repeating.
- In moments of stress, remember: "If it's not fun, I don't do it." Repeat until you almost believe it.
- Those jumper cables in the back of your vehicle can conduct a lot of current when pressed into service, even RF in some cases.
- When parking your open pickup truck at a transmitter site near a farmhouse with lots of cats, do not leave the station manager's bucket of chicken in the back.

What are your ideas? Email them to *radioworld@futurenet.com.*

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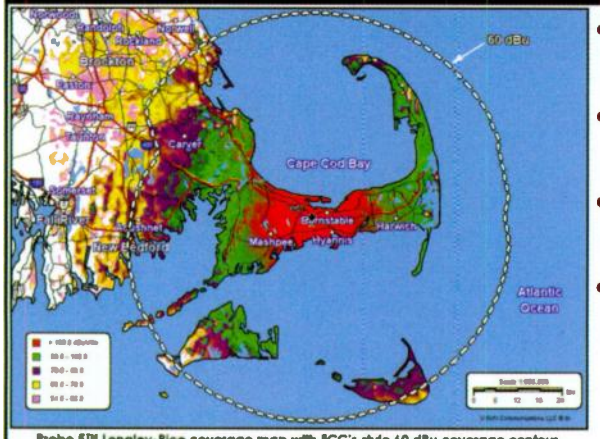

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World Radio History

Writer

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Three key trends for the future of radio

They do not work in isolation but increasingly are intertwined

We all know that the reports of radio's gradual demise are greatly exaggerated. Radio is gearing up for an even brighter future. Three trends will play an important part in this. They are IP and cloud technologies; remote production; and the flexibility to serve additional channels and platforms.

Remote production has become a powerful tool for creating content from just about anywhere. While certain shows call for an OB or remote van loaded with all the equipment you may (or may not) need at some point, operators increasingly focus on the absolute minimum in terms of size and weight, and on equipment that is simple to set up and operate. Nineteen-inch, carry-on "flypacks" are preferred.

Also think of the radio-in-a-bag initiative: A laptop with intuitive yet versatile radio software, an I/O box, one or two microphones and a pair of headphones are all you need to produce high-quality radio shows on the go. This works over an IP connection, whether tethered or via 4G.

Yet, software that runs off a laptop's hard disk forces operators to consistently use the same computer. A cloud-based solution would provide more flexibility. Streaming the contents to the broadcasting hub requires an IP connection anyway, so leveraging cloud-based software over the same connection should be reliable.

The acceptance of IP has inspired new workflows: Radio hosts present their shows from their homes, while a field reporter or technician facilitates interviews with guests in a different location, perhaps only holding a microphone to the guest's mouth, with the host asking questions.

Adding social media channels and instant messaging services makes for even more interactive radio shows. Producing more such "multi-platform" content to keep both staple and alternative channels humming has become easier and certainly more convenient for all parties.

Below
RTL Belgium, where the Magenta project has simplified operations.

Flexibility

Demand for more flexible systems spans the industry. At last year's NAB Show, the European Broadcasting Union published a white paper that emphasizes the need for a broader utilization of cloud technologies. "Cloud" doesn't necessarily refer to the public cloud. A centralized datacenter to which users connect over wide-area IP is often called a private cloud.

The white paper does not mention specific segments of our industry where flexibility is deemed crucial: the agility to adapt to changing production scenarios at short notice is expected everywhere.

Radio has come a long way. One inspiring example is an essentially hardware-free, virtualized radio workflow: RTL Belgium's Magenta project removes all clutter typical of traditional radio studios by simplifying operations and minimizing distractions for self-op radio hosts and DJs. Based on software-driven touchscreen operation with far-reaching automation routines that can be overridden when needed, the virtual infrastructure in Brussels serves two top-tier Belgian radio stations, bel RTL and Radio Contact, which use the same studios.

Radio hosts and DJs log into their preferred studio via an on-screen "Magenta Menu" where they select the station they work for. The menu then branches out into different applications, such as live on-air production, show recording, etc.

Pressing one of the two station buttons — BEL RTL or CONTACT — automatically adapts the visual elements and ambient lighting color (for visual radio) to the selected station. In parallel, the studio connects to the correct playout server and loads the relevant rundown and other radio tools.

All aspects have been automated to such a degree that RTL Belgium no longer needs an audio engineer in a separate control room for morning shows and other programs involving up to 12 attendees in a large studio. There is only one control room for a "director" in charge of seamless production flows — getting the required guests

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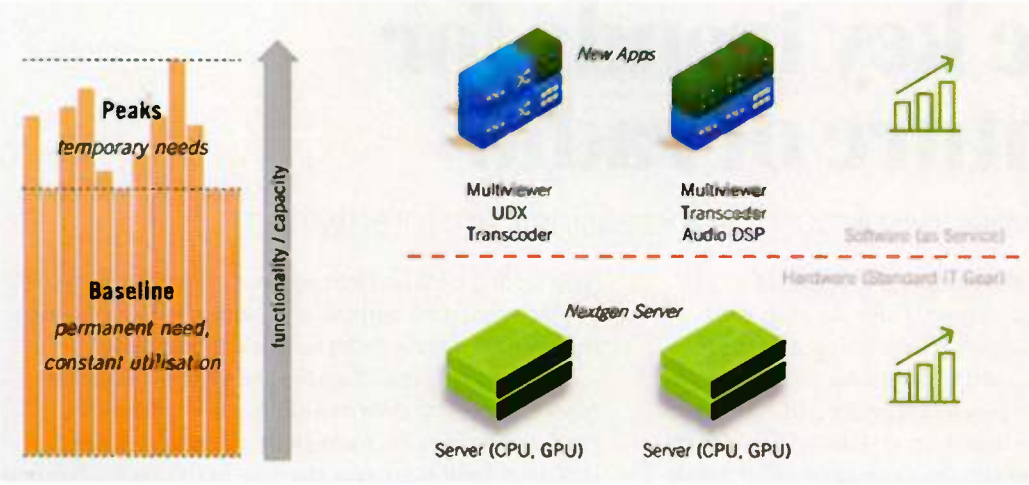


Above
Purely software-based signal processing benefits from a two-dimensional technology evolution. While processing apps evolve constantly to offer new functions in short cycles, the IT industry ensures that processing platforms increasingly grow in power. These two levels develop independent of one other.

Below
An orchestrator distributes processing apps dynamically across available host servers, guaranteeing the best possible use of resources.

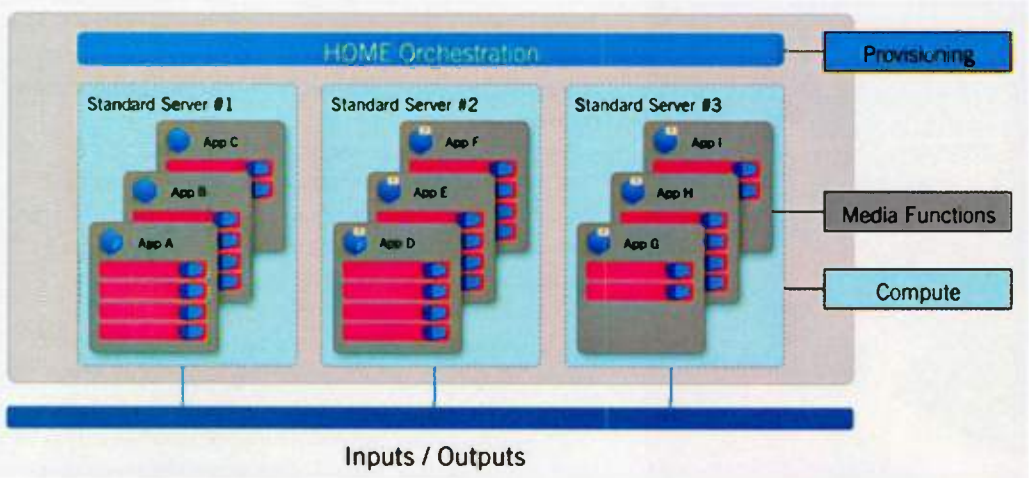
into, and out of, the studio on time, etc. — rather than monitoring and tweaking levels, starting clips and jingles, and the like.

Levels are controlled automatically by dedicated software, and nothing needs to be set by the hosts, unless they decide to override the automated rundown for some breaking news or other top-topical subjects.

Installing hardware in the refurbished studios was deemed too restrictive for RTL's vision to further refine the current workflows at short notice. The Magenta project allows the team to increase the system's flexibility and revise workflows at any time. Airing the radio program on RTL Belgium's TV channels is made easy by the IP connection between the two departments.

All radio tools are software-based. The VSM control system glues everything together, powers the Magenta menu for automated, single-press studio and playout configuration by the hosts themselves, etc. Thanks to this approach, radio hosts can literally "take their settings with them."

The VisTool app controls the I/O nodes and simultaneously hosts the Pluxbox user interface, which provides operators with the functionality needed to run a radio show.



The operator-facing user interface developed by Pluxbox controls the OmniPlayer playout system. The Magenta project is a light-house example of the efficiency afforded by open-standards-based IP and tight software integration for user-friendly, inspiring workflows. Getting there, however, was hard work.

Moving on

The tools that link the various software applications and the I/O hardware together, and the Ravenna/AES67 protocol to get any signal source to any destination are thus in place. But what if an even more flexible approach was available?

Imagine yourself planning for a major infrastructure overhaul. You probably have a good understanding of what the setup must provide for day-to-day productions. You also know that certain events require more extensive coverage, with more reporters and tools.

In the hardware world, this would mean planning for such special occasions, and so to order more equipment, just in case. Such excess gear sits idle most of the time, which tends to make your head of finance unhappy.

For TV applications, microservice-based processing apps are becoming the new normal. They run on generic servers in the private or public cloud, or in-house, and can be started and stopped as needed. While they are stopped, the server's processing capacity can be used for other tasks, which results in a drastic reduction of the hardware stack.

These apps are true container-based microservices, each with a highly specific function related to audio, video or audio mixing and monitoring with powerful N-1 functions. Their virtual inputs and outputs are separate, highly granular microservices that can be connected to the processing routines. They are granular in that you can easily specify the required number of I/Os, the transcoding format or up/down/cross conversion functionality, without overspec'ing.

In combination with a subscription scheme based on credits, users are free to reconfigure their entire setup several times a day. Active credits do not disappear when an app is stopped — they become available for unlocking other functional units. Everything is so intuitive that stations can focus on hiring genuine talent rather than technicians with a good voice. Are you ready?

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