RADIOWORLD

Your guide to radio technology

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10 ways to "remote in"
Free and inexpensive methods abound

How do you dB?
In Workbench, a quicker way to figure out decibels.

Codecs make connections
Buyer's Guide looks at codecs and STL.

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Here come the voice clones

Veritone and iHeartMedia take synthetic voices to another level.

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Learn from top system integrators

How can you get the most out of your SI relationship?

Paul McLane
Editor in Chief

Working on a facility project with a system integrator?

"Get started early," says Shaun Dolan of Inrush Broadcast Services. "We've been able to help some broadcasters do some pretty interesting things, especially with software architectures, that wouldn't have been possible otherwise, because we got the conversation started early."

"Begin with the end in mind," says Bo Hoover of Technical Services Group. "Do the engineering planning or drawings, even if it's a well-developed napkin sketch, and work the project backwards. ... Don't get in too big a hurry, do the homework first."

Include your staff in the planning phase. "Because they're the ones that have to operate it and make it work," says Greg Dahl of Second Opinion Communications. If the people who work in that new studio find it difficult to use, your project could be deemed a failure.

Also ask your integrator in advance how "change management" will work.

"What kinds of things might trigger a change in cost or change work?" says Erik Utter of Utter Associates. "When there is a design change, or a workflow change, or a construction delay, what happens? Have a documented change order process, so that everybody is on the same page and you can minimize surprises."

Don't pay an integrator for work that can be done more efficiently by a local resource. "In every market, there's a company that pulls hundreds of thousands of feet of Cat-6 every month for every business in town," says Ed Bukont of E2 Technical Services.

And keep an open mind. Remember there's more than one right way to do things. Allow the integrator to give you the benefit of their deep experience.

"Just tell them what you want," says Jim Hibbard of Pacific Mobile Recorders. "And then listen to what they have to say."

You can read more on this topic in our ebook "The World of System Integrators" at *radioworld.com/ebooks*.

THIS ISSUE

Fee Hikes "Seem Like Punishment"


Getty Images/Thomas Jackson

The NAB gave the FCC an earful over that proposed increase in annual regulatory fees, which would jump by approximately 13%.

NAB says the proposal exceeds the commission's statutory authority and falls well short of achieving its stated goals "by unfairly, unlawfully and disproportionately burdening broadcasters with subsidizing the costs of FCC activities that do not benefit them. ... The commission's methodology of fee-setting needs revamping to make sure tech companies affected by FCC broadband regulations are paying their fair share."

NAB acknowledges recent steps taken to exempt broadcasters from certain broadband-related costs. However, "this year's fee proposal takes significant steps backward by abandoning the modifications and taking no action on the growing need to expand the base of payors to include the beneficiaries of the bulk of the commission's primary activities: broadband internet service providers."

As a result, NAB says broadcasters face "what seems like punishment and a fee increase that is more than six times the magnitude of the commission's budget increase."

Radio fees would range from $690 for an AM Class C in a small market to as much as $23,585 for an FM licensed to a major city.

NAB argues that broadcasters provide a free service and cannot easily absorb unjustified increases. It says the FCC's budget has swelled by nearly $43 million the past two years, primarily to support broadband activities. "The commission has admitted to Congress that 84 direct FTEs [full-time equivalents] in the Media Bureau are working to promote a 100% broadband policy."

In addition, NAB asks the FCC to increase the threshold for small broadcasters, currently set at $1,000, below which fees are waived because collecting them costs more than they bring in.

Writer

Randy J. Stine

Radio World's lead news contributor wrote about radio's new hybrid workflows in July.

Veritone synthetic voice gets an audition

iHeart to use voice cloning AI to translate podcasts

iHeartMedia's plan to use Veritone's voice-cloning technology for its podcast platform has some radio industry observers asking the obvious questions: How good does it sound and is broadcast radio far behind?

The largest radio company in the United States says that for now, the synthetic voice solution will only be used to translate podcasts from English to other languages for use on the iHeartPodcast Network, first for Spanish-speaking audiences. But Veritone officials confirm its technology could someday be used for advertising to reduce time-to-market and production costs for radio.

One veteran broadcast engineer said Veritone's voice cloning product is exactly the sort of tech breakthrough that media are quickly adopting as the industry embraces cost-saving measures, and could at the very least bring a more centralized approach to commercial production and staffing by leveraging artificial intelligence.

There are literally dozens of examples of text-to-speech apps available commercially, many of which can convert text into human-like speech, even if it still might sound a bit robotic or unnatural. Observers familiar with this technology say some of the services on news websites are becoming good enough to be "almost indiscernible from real human voices."

But what Veritone and iHeartMedia are trotting out appears to be an effort to take synthetic speech and voice cloning to another level, according to those familiar with the AI platform.

Veritone says "hyper-realistic custom voice clones" will offer increased revenue streams for

branded synthetic voices of top talent — imagine the cloned voice of Ryan Seacrest someday pitching for the local hardware store.

Veritone launched Veritone Voice in 2021, saying it has the ability to "control and manage the entire voice creation lifecycle for efficiency and scale." The company says its synthetic voice solution will afford iHeartMedia the opportunity to reach new audiences at scale with their current top podcast talent.

"With no additional studio time, voice talent can authorize Veritone's synthetic voice solution to automatically produce more podcasts, advertisements and additional audio in multiple languages with the same energy, cadence and uniqueness of top talent," the technology company says.

Veritone, which reported its first quarterly profit in Q4 2021, says its cloning software ingests several hours of audio that uses AI to train the system on how to produce the synthetic voice. "The more audio, the more life-like the results," its executives say (see sidebar on page 8).

CEO Chad Steelberg said on an earnings call this year that in addition to the iHeart agreement, the AI company is inking deals in a number of voice markets beyond podcasting like audio books, production studios, audio advertising and digital influencers.

Veritone has been aggressively pursuing tech startups specializing in synthetic voice development, according to its press releases. Its recent acquisition of VocaliD will "further enhance the company's existing synthetic voice offerings for commercial enterprise including brands, podcasters, broadcasters, studios, publishers and corporations," according to Veritone.

"The artificial intelligence that very smart people are working on to power voice technology is progressing a mile a minute."

Conal Byrne, chief executive officer at iHeartMedia Digital Audio Group, says the media company is in the "test phase" of using voice cloning to translate podcasts from English to multiple other languages.

The company says it plans to use Veritone's technology to allow celebrities, athletes, influencers, broadcasters, podcasters and other talent to create and monetize synthetic voices that can be transformed into different languages, dialects and accents for its podcast network.

"This is really about audience expansion," Byrne said. "The artificial intelligence that very smart people are working on to power voice technology is progressing a mile a minute. And in a lot of ways it is going to explode open the audience of podcast creators and broadcast radio influencers. The more we look into voice technology, the more we see it accelerating audience growth."

Above
A Veritone promotional graphic highlighting its concept of "Voice as a Service."

Below
Conal Byrne

Byrne says iHeart will be "careful and respectful" of creators' voices. "Nothing will happen without the creators' approval, input and collaboration, as it should be with any new technology."

"Anything you can read"

Text-to-speech technology is now to the point that anything that is text-based is convertible or will be convertible, Byrne said.

"Anything you can read is now convertible into audio. That interests us since we are an audio company. That brings us a lot of really interesting opportunities when it comes to people's audio journey. The world is going to audio."

It is not clear yet whether iHeart's podcast platform will disclose to audiences in advance of programming that synthetic voice is in use.

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1 = Coming Soon | 2 = Requires an additional internal card

"It's too early yet to address disclosure and exposure. Much of it will depend on when we discover how audiences really feel about it," he said.

Byrne says iHeartMedia hopes voice AI eventually will allow it to customize advertising on the iHeart Podcast Network to individual markets.

"If I capture enough of the creator's voice with the cloning technology, through customization and tailoring, we can create advertising to local markets the way we can't right now."

And it's that ability for audio companies to manipulate audio via synthetic voice that excites iHeart and advertisers.

"It's a whole other thing to be able to tailor those ads to the 158 markets that iHeart trades in and has local boots on the ground selling. Thanks to this new technology advertisers won't be limited to national campaigns. Perhaps now they will want to customize ads for 12 or 13 geo territories or cities they want to market in," he said.

"As an audio company — whose stock in trade is to give creators the opportunity to gain as much audience as they can and to give brands access to those audiences in smart and integrated ways — it hard not get excited about."

Byrne said he can confirm iHeart has yet to begin testing "same-language synthetic voice tailoring or customization" but added the audio company has "certainly thought a lot about it."

"Advertising customization using voice technology" for podcast and broadcast is going to be the logical next step, he said. "But we have no timeline to move forward with it."

Coming to market

It's not much of a stretch to think that voice cloning technology will begin leaking into broadcast, says one observer who is intrigued by its possible introduction to United States radio.

More on Veritone's synthetic voice AI

Sean King

Sean King is senior vice president and general manager of commercial enterprise at Veritone.

What kind of deep learning artificial intelligence is involved to create synthetic and cloned voices?

Sean King: For synthetic AI-generated human voice, at a basic level, there are two ways you can break this down.

First, stock or generic voices that sound like that of a real human but are not replicating an individual voice.

And secondly, custom voice, which is a process where an individual's unique voice is cloned. Once all approvals are in place with the consent of the talent, a custom voice model can be created with about three hours of clean audio. From there, the voice model can generate new material with that individual's voice from either text (text to speech) or audio (speech to speech).

It could be possible to create a completely new voice by using additional AI to combine generic AI voices and adjusting pitch, tone and cadence, etc. Veritone has not yet been involved in any use cases of this nature.

Has Veritone undertaken studies to determine whether listeners can tell the difference between real and synthetic?

King: We have not conducted formal studies here. Stock voices are getting much more realistic. In short form, such as radio liners, it can be difficult to hear the difference. In long-form, most listeners would be able to pick up on some of the AI-generated nuances.

Custom voices using voice cloning, on the other hand, can be nearly indistinguishable.

Do audio services run the risk of eroding that intimacy and trust, an inherent radio value, by deploying synthetic cloned voices?

King: With a custom voice, the voice model includes the talent's — in this case the podcast host's — natural cadence and uniqueness of their voice. It is truly their voice. And in fact, with Veritone, they own their voice clone.

With the ability to localize their voice and release their show in multiple languages, they could actually form an intimate relationship with new audiences they couldn't otherwise, such as the Latinx market.

Should there be a requirement that the listener is informed they are not listening to a human voice on iHeart podcasts?

King: It's up to the talent and company what, if any, disclaimers are used. Again, there are scenarios when it's a best practice to give a disclaimer. On the technology side, Veritone creates an inaudible watermark on all voice recordings for further verification.

What do you see as the next evolution or phase in AI and cloned vocals?

King: Synthetic voice combined with avatar technology (3D human clones) to create more humanized conversational AI for uses such as customer services, sales, recruiting, patient care and more.

Veritone says in a press release that the technology can be used for advertising to cut production costs for broadcast radio. Is it Veritone's hope to have iHeart use it for such, or are you pitching the technology to other radio broadcast groups?

King: Veritone is in conversations with several major radio conglomerates, globally and numerous stations.

And do you foresee a time when your synth voice technology could be used to fill on-air shifts at radio stations?

King: Synthetic voice could one day certainly be used for liners, sweepers, stating imaging and commercials. And on-air talent can let their voice clone do some work for them while they handle other priorities especially if they need to travel, have a family emergency, or if their voice is compromised from an illness.

Veritone does not wish to replace humans, ever; our goal is to help take the burden off when possible while creating efficiencies to increase productivity.

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"Some have voiced concerned as this tech jumps to America," said Gary Kline, former director of engineering at Cumulus and now a radio engineering consultant.

"The next thing we know, we have cloned voices doing middays. Will that eventually happen? Yes. I do think so. At first, I think we will see AI used for commercial production. In fact, I've already seen and heard examples of this in Europe."

Kline notes that synthetic voice is already being used for small-market radio weather reads via Westwood One's partnership with the Weatherology service. It provides test-to-voice localized weather forecasts customized for radio station clients.

From the Westwood One website: "The extraordinary text-to-voice Weatherology system delivers forecasts directly to your local automation system for play in the next scheduled weathercast position, or in the case of severe weather alerts — as the next event — depending on how you choose your custom setup."

Let's Hear Your Voice

Comment on this or any story. Email *radioworld@futurenet.com.*

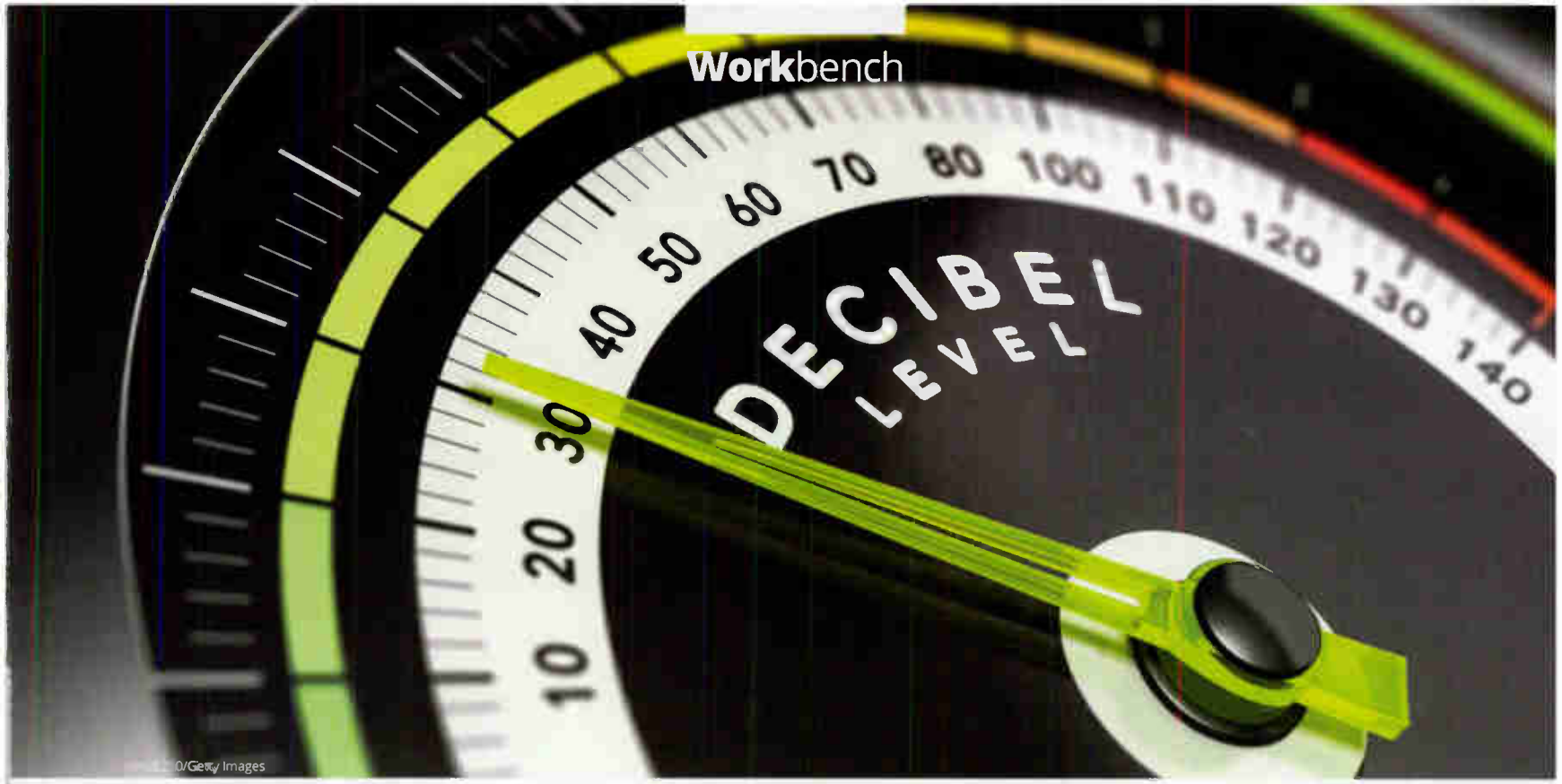
And the National Weather Service has utilized TTS computerized voices to read weather watches and warnings across the country for several decades, even though it has often been criticized for mispronunciations. NWS introduced a new voice in 2016, nicknamed Paul.

One industry engineering observer told Radio World he has grown weary of the NWS voice software that is "frequently off with its inflection and typically lacks any human emotion."

He continued: "Imagine having a naturally spoken synthetic voice consistently and clearly delivering alerts rather than the crude text-to-speech mechanisms or poorly relayed recordings we currently have. Weather forecasts and alerts would be a related application."

Radio World will continue to report on developments in synthetic voice instruments and the AI that drives them.

> **"The next thing we know, we have cloned voices doing middays. Will that eventually happen? Yes. I do think so."**



0/Getty Images

John Bisset
CPBE

The author has spent over 50 years in the broadcasting industry and is in his 32nd year 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.

A quick way to figure out dB

Also, a handier shim for lifting a rack or door

Newman-Kees Consulting Engineer Frank Hertel sent a simple resource that he calls the Decibel Cheater Chart.

By remembering the basic numbers and pattern of the Voltage and Power steps shown, you can come up with the approximate dB values in the field, without needing a calculator.

When a much more accurate answer is required and you do not have a calculator or cellphone utility handy, you can pull this chart from your billfold and resolve the answer in your head (with a little thought). A pen and paper make it even easier.

Frank writes that the key to resolving an answer in your head is to become familiar with the repeating sequence of the numbers shown. As you study the chart you will recognize the repeating steps and hopefully remember the sequence.

Even if you cannot remember the entire sequence of the repeating steps, just remember the two notes at the bottom, which will help you come up with an approximate answer.

Every time you double power (or cut the power in half), that it is equal to a 3 dB change in power.

Likewise, every time you double voltage (or cut the voltage in half), that it is equal to a 6 dB change in voltage. Using these two rules (and your noggin) will get you very close to the actual value.

Decibel Cheater Chart

Power Ratio	dB	Voltage Ratio
1	0	1
1.25	1	1.2
2	3	1.4
4	6	2
10	10	3.16
100	20	10
1,000	30	31.6
10,000	40	100

Notice the pattern of numbers and how they repeat in steps, particularly in Power Ratios.

FORMULAS:
dB Change in Voltage Ratios:
Voltage 1 divided by Voltage 2 — then take the LOG of that answer and multiply it by 20

dB Change in Power Ratios:
Power 1 divided by Power 2 — then take the LOG of that answer and multiply it by 10

Right
Use Frank Hertel's Decibel Cheater Chart to relate dB to power and voltage ratios

Not just for hams

From time to time, readers request recommendations for printed engineering resources.

Both the SBE and NAB offer a variety of technical books for sale. I was talking about this subject with my neighbor

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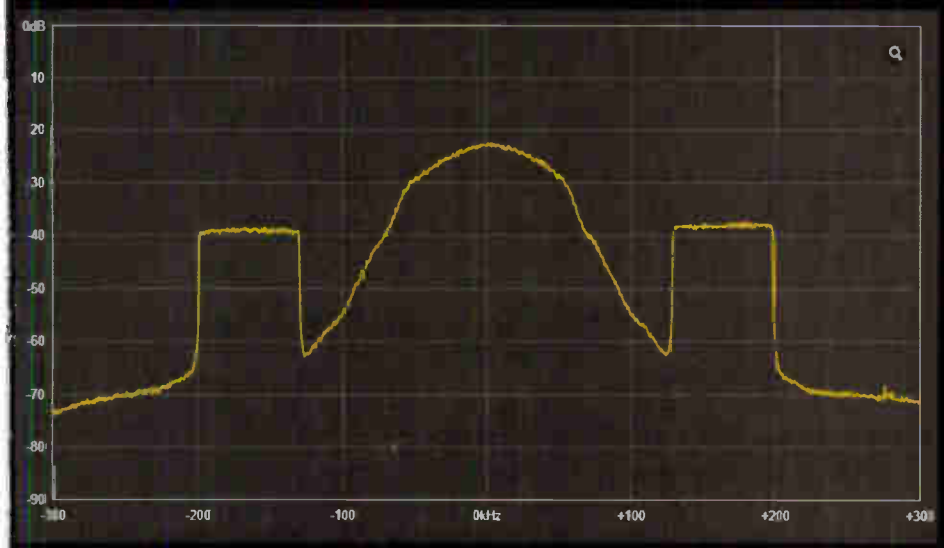

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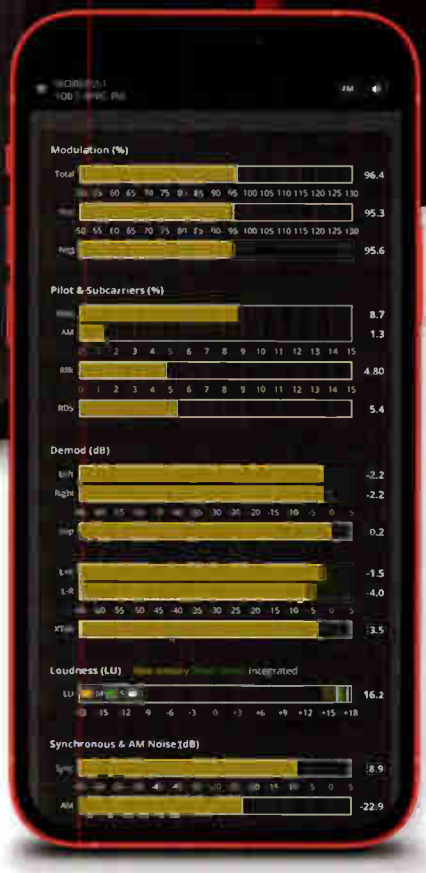

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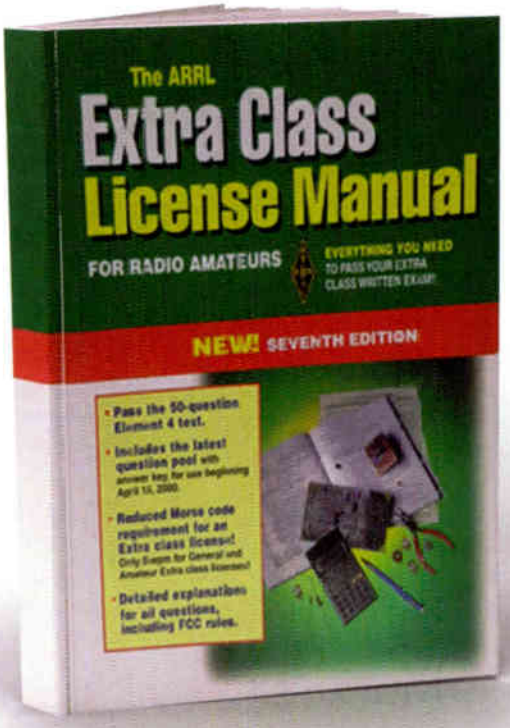


Right
The ARRL offers a variety of practical engineering books.

Far right
Let the Air Shim do the 300-pound heavy work.

recently, a power engineer retired from Santee Cooper, a South Carolina utility. Russ Albright is a ham. He showed me a copy of the American Radio Relay League's Extra Class License Manual.

In addition to helping reader achieve the Extra Class license, the book is full of chapters describing electric principles, circuit components, radio wave propagation and antenna principles.

If you are an IT-based engineer and looking for more instruction on RF topics, browse *https://home.arrl.org/action/Shop/Store*.

Send us your favorite book tips.

No Need to Shout
We welcome your tips at any volume level! Email *johnpbisset@gmail.com*.

DIY galore

Thanks to Workbench readers who remarked on the air conditioning maintenance video produced by Silver Cymbal of Massachusetts, found on YouTube.

At your urging, I did a YouTube search and found more than 300 do-it-yourself videos produced by Silver Cymbal. A few stand out for broadcast engineers.

First, if you are in charge of maintaining station vehicles, I saw one that describes a five-minute engine cleaning process that achieves "like new" conditions under the hood. Not only does a clean engine look nice, it also makes spotting leaks easier.

The process described in the video uses P21S Total Auto Wash (under $20 from Amazon). A hand sprayer to apply the P21S is recommended. On YouTube, search "Clean & Detail Your Car Engine in 5 Minutes."

Another video describes a tool that every engineer should have in their tool box. It's the #1190 Air Shim Inflatable Pry Bar and Leveling Tool.

> **"This is a very thin rubber bladder that is inflated using a squeeze-ball-type pressure bulb."**

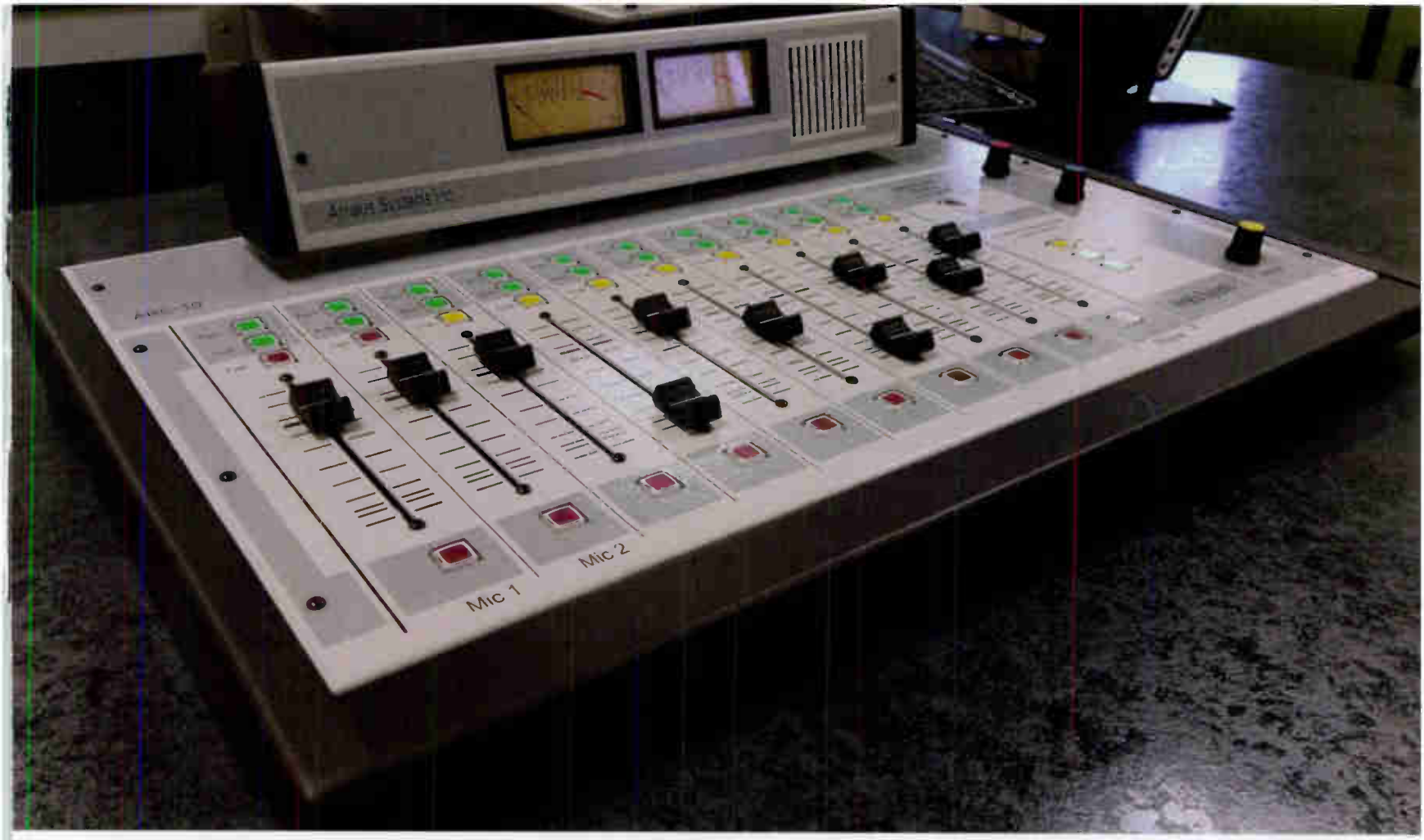
Manufactured by Calculated Industries and sold for under $20 on Amazon, this is a very thin rubber bladder that is inflated using a squeeze-ball-type pressure bulb, similar to that used on a blood pressure cuff.

As the video shows, it can be used as a pry bar, helping you get into your vehicle when you lock the keys inside!

But thanks to the 300-pound load capacity, this unique product also can assist with moving heavy objects or adjusting those little leveling feet on certain appliances and equipment racks.

Another use is supporting a door as you mount it on hinges. You simply step repeatedly on the pressure bulb until the "Air Shim" raises the door to the level needed to insert the hinge pins.

On YouTube, search "AIR SHIM - 1 Tool with 1000 Uses."



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Writer

Dan Slentz

The author wrote about using Descript software in the previous issue.

Your Thoughts Please

Comment on these tips or send your own. Email *radioworld@futurenet.com*.

10 alternatives for "remoting in"

Free or inexpensive options abound for accessing your systems remotely

Many of us remote into our computer systems, whether we are an air talent working from home who needs to jump onto an automation system, a PD helping a jock or an engineer accessing a remote transmitter system.

Your company may require you to use a virtual private network through its IT department. But sometimes it becomes necessary to use VPN through third-party applications and services.

These can range from paid services like TeamViewer or AnyDesk to the path through the Google Chrome browser. But since any "open door" can let in unwanted "guests," pay serious attention to passwords and use proper protection when opening ports.

Companies like TeamViewer and AnyDesk are prime targets for hacking. They do run heavy encryption and are generally fairly secure; but you can create vulnerabilities if you don't, for instance, practice smart password protection.

Work with your IT team and follow their protocols. And if the IT team is you, do the research to prevent unauthorized access, including beefing up your firewalls if necessary.

Note, some paid services are free for use by non-profits on a limited basis. But remote browsing provider AnyDesk recently started reminding users that anything more than simple "personal use" requires a subscription. When a company does this, it's not long before they start cracking down on users they feel may not be playing by the rules. Like TeamViewer, AnyDesk may feel that non-profits are using their services more than was desirable.

Offerings differ between companies. Check for screen resolution, ability to hear audio, and latency of mouse and keyboard. Some free services throttle speed on transfers or limit usage. Also, some services are simple software loads and allow unattended remote access, while others require you to run a "server-type platform" onto the remote computer for it to work.

Most often, paid services host the server platform for you, which is why they can be easier to use than the free, open-source software.

Here are five free and five paid alternatives for remoting into your computer. Most working with Win, Mac, Android, iOS and Linux systems. A simple internet search can provide more details on each of these and many other options. When you narrow down your search, dig into more information that can help you decide if one of these might be a better resource for your own needs.

Five Free

Most have limited or no support; some also cap data and speed. Except for Google's offering, the following are open-source and may require a more advanced user.

- Google Chrome Remote Desktop — https://remotedesktop.google.com
- DW Service — *https://www.dwservice.net/en/*
- Remmina — *https://remmina.org/*
- Tight VNC — *https://www.tightvnc.com/*
- UltraVNC —*https://uvnc.com/*

Five Paid

Most of these providers also have some form of "free to use" version:

- ExpressVPN — About $7 per month. *https://www.expressvpn.com/*
- PIA (Private Internet Access) — If you sign up for three years, only about $2 per month. *https://www.privateinternetaccess.com*
- ProtonVPN — They offer a single free connection service; otherwise $4 to $24 per month. https://protonvpn.com/
- PureVPN — About $2 per month, with specials for longer agreements. *https://www.purevpn.com/*
- Surfshark — Under $2.50 per month. *https://surfshark.com/*

Prices range wildly. Even the quality and type of service can vary greatly. Many if not most of the paid offerings are based outside the U.S., which can affect communications with tech support or billing, and contributes to the variety in prices. Be sure to shop around and look for reviews from several sources.

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About Buyer's Guide

The Buyer's Guide section appears in every other issue, focusing on a particular category of equipment and services. It is intended to help buyers know what's on the market and gain insight into how their peers are using such products.

Pattison Media installs Gateway

"Morning shows from anywhere was the hope"

Barry Mandziak is responsible for six stations in his role as technical supervisor for Pattison Media's operations on North Vancouver Island in British Columbia, Canada.

"During the pandemic our office buildings and studios in Nanaimo, Courtenay and Port Alberni emptied out, and we had to ramp up our remote broadcast capabilities immediately to support announcers and producers working from home in remote studios," he said.

"We had only four Tieline Bridge-IT units and were running six shows. We purchased a Tieline Gateway eight-channel IP codec that would be wired into our Nanaimo studio location. This would service all four of our morning shows and all the remote cut-ins. Morning shows from anywhere was the hope."

The Gateway 8 provided the option to phase out copper ISDN lines completely and rely on the Gateway 8 connected over fiber to Bridge-IT codecs.

"We also use the Report-IT Enterprise app extensively over cellular connections for both shows and remote cut-ins."

The Gateway 8 services two Parksville stations, CHPQ(FM) and CIBH(FM), as well as CHWF(FM) and CKWV(FM), both out of Nanaimo. It is connected 24/7 on two stations.

"We've never had any dropouts or audio issues," Mandziak said. "We now do morning shows remotely from announcers' homes and other locations that often change daily. We also connect to the Gateway for remotes and voice tracking. If anyone gets sick, they can easily do their show from home using the Report-IT app as a codec and transport."

The upgrade has allowed the stations to get rid of all their copper ISDN links and increased their capability and flexibility. Mandziak said the savings from dropping the ISDN and broadcast loops was appreciable.

Right Top
Morning host Bill Dean has the Tieline software interface open on-screen.

Right Bottom
The Tieline Gateway in the rack

More Info
tieline.com

They get stations on the air from anywhere

Comrex Access NX does the job for Radio FM Media

More Info
www.comrex.com or email sales@comrex.com

Right
Jeff Culhane interviews North Dakota State University President David Cook during an NDSU baseball game.

Radio FM Media is a premiere marketing company specializing in radio, branding, digital and events. It owns and operates seven stations in Fargo, N.D. It also offers engineering services to other radio stations in the area.

"I'm an engineer for 22 stations across southeast North Dakota, and I handle everything from the computers in the studio to the transmitters and everything in between," said Jake Bechtold, assistant engineer and IT manager for Radio FM Media. "It's a lot of running around between all the different markets."

The stations incorporate a variety of remote programming, ranging from promotional remotes to live sports coverage, including coverage for North Dakota State University football. They've been using Comrex Access products for over 13 years, and recently, some of the stations they support have upgraded to Access NX, a portable IP audio codec designed for remote broadcasting.

Access NX has given the stations Radio FM Media supports greater flexibility.

"There's a large country music festival near us, and we always want to do a live morning show from the site," said Bechtold. "Now, when we're planning that broadcast, it's no big deal; we just bring the Access NX and hook it up. There are so many different things we can do with it."

Bechtold uses a range of networks with Access NX, including Verizon MiFi hotspots, hardwired internet connections and school WiFi networks. The versatility of its network options makes it possible to adapt networking strategies quickly, depending on what each location offers.

Bechtold, a long-time Access user, noticed pronounced improvements in the Access NX units. He said setting up WiFi on the new version is "a million times easier" than on the Classic. "I also think the add-on mixer is greatly improved, and the second headset input makes a huge difference. It's made an already good product even better.

"The biggest thing for me with the Access is it just works," said Bechtold. "You plug it in, you hit connect and you're there."

Tech Update

MAXXKONNECT WIRELESS

MaxxKonnect Wireless Adds User Portal

MaxxKonnect Wireless will launch an interactive customer portal in the fourth quarter.

The company said it will allow customers to check their data consumption as well as provide a quick reference to all of their MaxxKonnect Wireless SIM and device information. That includes static IP information, SIM ID, device IMEI, SIM state as well as carrier and MDN.

The portal will give customers the ability to set data usage alerts. Usage alerts can notify customer-assigned contacts as to when their usage on a particular device, or their device pool, reaches customer defined thresholds.

Multiple levels of threshold alerting will be possible. Alerts will be via email, with plans to add other methods in the future.

MaxxKonnect has also partnered with Teltonika Networks to provide Remote Management Service (RMS) to MaxxKonnect-branded routers, at no cost, with an active MK Wireless subscription.

"RMS gives you secure management access to your MK router dashboard without the need for VPNs or port forwards," it states.

This is for current and new Wireless customers with a MaxxKonnect RUT or X series device. Current customers should email *support@maxxkonnect.com* to set up the RMS account.

Info: www.maxxkonnect.com

Intraplex product line continues to evolve

Includes two new embedded single-channel full-duplex IP audio codecs

More Info
www.gatesair.com

GatesAir offers the Intraplex line of products for applications that require reliable signal transport. Keyur Parikh is vice president, engineering.

What is the most important trend for radio broadcasters in how codecs are used to transport audio?

Keyur Parikh: The use of IP-based networks for broadcast audio transport is particularly sensitive to reliability and security of the signal, and far more than telephony applications. Therefore, robustness and security of audio continues to be an ongoing trend.

Besides this, customers are looking for highly integrated feature sets within the audio codec to avoid having multiple separate functional boxes, such as an audio processor or GPS unit.

Finally, more broadcasters are migrating to the cloud. We now see audio codecs that are built on a software platform that can be installed on a virtual machine or a container. This is especially true for high-density audio codecs.

What is the latest introduction from Intraplex?

Parikh: We continue to introduce new models to the Intraplex IP Link family, all of which have highly integrated feature sets.

Our IP Link 100e module and cost-efficient IP Link 100c codec were introduced at the NAB Show. Both are embedded single-channel full-duplex IP audio codecs, built on a purpose-built hardware platform with powerful software processing engines. Both share a common hardware and software core with different form factors. The IP Link 100e plugs into our Flexiva line of FM transmitters, and the IP Link 100c is a half-rack unit.

In 2020, GatesAir also introduced the Intraplex Ascent platform, which is a cloud-enabled multi-functional software platform with a high-density audio codec as well as video and audio distribution functions.

All platforms support three or more IP network interfaces and support Intraplex's Dynamic Stream Splicing to take advantage of multiple diverse IP networks.

In addition, the new products support Secure Reliable Transport (SRT) protocol to provide the added reliability and security of content with AES encryption. Also, all new products support 10-band state-of-art audio processing capability, which is powered by ATC Labs SoundMax technology. Both new embedded products also support built-in support for GPS for FM SFN applications.

Having the built-in GPS and audio processing capabilities, in addition to all the reliability and security capabilities, significantly reduces operational cost.

GatesAir will continue to expand the capabilities of audio transport and signal monitoring. We are working on several new features which will be released over the next few months to help broadcasters streamline their operations.

Intraplex recently announced the addition of ATC processing, as you mentioned, and native Livewire support to certain models. Why is this notable?

Parikh: They exemplify how the Intraplex brand continues to evolve. The Livewire capability extends Intraplex into the studio networking space. Ascent can now ingest and output multiple LiveWire+ audio channels directly via IP without the need for conversion equipment, which adds a new layer of scale and efficiency for radio broadcasters managing many digital audio channels between studios. And the ATC Labs partnership allows us to integrate audio processing within our codecs.

Can you give an example of recent applications?

Parikh: All of these products have been utilized in several projects, ranging from C-band replacement, high-density studio-to-studio audio transport and wide-scale distribution where a single Ascent feed audio streams to a larger number of hardware-based IP Link hardware codecs.

Above
Intraplex IP Link 100c, 100e and Ascent

WORLDCAST SYSTEMS

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More Info
http://telosalliance.com

Lightning 100 puts Telos Z/IP One to work

"Being able to broadcast live music from anywhere is just super-cool"

Engineering live remote broadcasts runs in the Hansen family.

Tom Hansen has engineered hundreds of live broadcasts from commercial remotes and live music venues, including a dozen years at the Bonnaroo Music and Arts Festival. As chief engineer for Tuned In Broadcasting, he drove it transition from ISDN-connected Telos Zephyr codecs to Telos Z/IP One IP codecs.

Right
Lightning Casey at the mic.

Below
At the SkyDeck remote. The codec is in the travel case just below the laptop.

Now that Tom is VP for sales and marketing at the company's WRLT(FM) in Nashville, his son Collin Hansen is its remote broadcast tech.

"I set up live remote broadcasts for Lightning 100," Collin says.

"These are usually long-form shows with live bands. Nashville has some amazing live music venues like the SkyDeck at Fifth and Broadway. That's where these pictures were taken.

"We also originate 'Nashville Sunday Night' from 3rd & Lindsley Bar & Grill. My dad and others have engineered those broadcasts since the ISDN days, but we've been using Telos Z/IP Ones over the internet since 2014."

Collin set up the broadcast from the National Moonshine Day Shine Fest in May.

"The Z/IP One did a great job. We remote-control our automation system back at the studio over the same internet connection that we're using for the Z/IP One."

What about prep work for broadcasting from a new location?

"I work with the venue to get appropriate internet connectivity for our Telos Z/IP One. Usually we use wired internet at the venue, but sometimes we adapt from their W-iFi, or we use our own Wi-Fi hotspot if we need to. We'll typically set the Z/IP One for 128 or 256 kilobits per second using the AAC Low Delay codec. It depends on whether we're wired or using Wi-Fi.

"You can take a board feed from the venue and run that into the Z/IP One. Then, pick it up at the other end with the Z/IP One there, and it sounds great. As long as you have a reasonable internet connection it's going to work well. Being able to broadcast live music from anywhere is just super-cool."

> **"We've been using Telos Z/IP Ones over the internet since 2014."**

Tech Update

AEQ Phoenix Venus 3 Is Upgraded

AEQ Phoenix Venue 3 is a dual IP stereo, full-duplex audio codec system.

With one unit it's possible to establish two bidirectional stereo or four mono (to one or two different locations). It works with SIP protocol, complies with the N/ACIP recommendation of the EBU and includes Opus algorithms.

Tools for configuration, remote control and assistance are included. The unit features balanced analog audio inputs and outputs through XLR connectors as well as I/Os for AES /EBU digital audio. There's a dual network port, dual RS-232 ancillary data link and dual power supply. Dante AoIP Network audio inputs and outputs are available optionally, as is a 48V DC power supply version.

With the latest firmware it is now possible to use both channels of Venus 3 to send the same audio through two Ethernet ports physically connected to different ISPs, sending an RTP stream to the same destination codec.

The AEQ receiving codec, which has a single internet access, is now able to detect the best stream to decode and can switch virtually seamlessly between the sources. It will return the feedback if required to the same path address. This way, easy but robust ISP redundancy can be implemented.

Also new are real-time audio stream statistics that can be graphically represented in the controlPhoenix application. And it is now possible to dial in RTP mode using the destination DNS and port (e.g., master.aeq.es:5008). The need for a static IP address in the studio is eliminated if you're using a Dynamic DNS service or similar that provides a name that doesn't change over time, so all talent in the field can call there. This also applies to the active remote control, and codecs can be configured to send control queries to the same studio IP address, specified by a name.

Info: www.aeqbroadcast.com, www.aeq.eu

CallMe supports shift from dedicated hardware

Vortex Communications offers both cloud and hardware/server solutions

Vortex Communications Ltd. makes and supplies audio and video equipment to broadcasters and system builders worldwide from its base in the United Kingdom. Ian Prowse is director.

More Info
https://vtx.uk

What's the most important trend in the use of codecs?

Ian Prowse: Over the last year, we have seen broadcasters moving away from dedicated hardware codecs towards server-based solutions running as Windows services.

CallMe-TX uses our CallMe codec engine to provide the equivalent of multiple CallMe IP audio codecs on a single MS Windows platform. Each channel has 20 kHz broadcast-quality Opus plus G.722 and G.711 audio coding algorithms, along with SIP connectivity and ASIO/MME support for hardware and virtual soundcards allowing integration with AES67, Dante and analog systems.

CallMe-TX provides a single back-end solution for program and VoIP/PSTN sources, with user-configurable numbers of channels for different applications, just like having a bank of hardware codecs that can be linked or split as needed.

By replacing individual dedicated hardware, CallMe-TX enhances broadcasters' green credentials by reducing their carbon footprint in both initial purchase and end-of-life recycling, whilst consuming less energy than individual units, requiring less cooling and rack space.

Above
CallMe Click & Connect is used by the BBC under an enterprise license. Here, journalist Stuart Clarkson was being interviewed by BBC Radio Solent.

The line includes several iterations of codecs.

Prowse: We have both cloud and hardware/server solutions.

CallMe Click-&-Connect is our browser-to-hardware solution that lets broadcasters put guest contributors, and indeed reporters, live on-air with 20 kHz audio by connecting them to existing studio hardware codecs without them needing to have their own device or download codec software.

Using Click-&-Connect, journalists can report live and play out pre-recorded files, removing the need for them to be uploaded to the studio to manage for the segment, handing over live and back again.

CallMe-diRECt is our browser-to-browser add-on that additionally provides lossless recording of both sides of the interview in case of connection issues during live streaming.

Our hardware codec CallMe-T (as in ET Phone Home) was originally developed as a low-cost back end for Click-&-Connect for those who could not afford even the lowest-cost full-blown codec. It has since found its place not only with smaller stations on a budget but with larger broadcast groups such as the BBC, Global Radio and IMG, where it has proved itself as a robust simple-to-operate hardware solution for program and comms.

You announced a partnership with Mike Dosch and Angry Audio in 2020. Can you update on that?

Prowse: We were put in touch by a mutual customer. Catfish's knowledge, experience and vision complements our commitment to the North American market, and his input prompting fairly small changes to suit market requirements has led to solid increases in sales, where we fit into a number of niches including cost-effective codec solutions.

It was his contact that led to the relationship with SoundStack / EmpireStreaming, who provide enterprise digital audio solutions and were one of the first audio CDNs to virtualize studios to radio stations around the world.

To incorporate remote broadcasts and real-time news updates into the virtualized radio studio, SoundStack has been using the CallMe-TX software codec with much success as an integrated live contribution system with low latency and high-fidelity sound, with CallMe Click-&-Connect with its file replay capability, acting as the reporter client.

What else should we know?

Prowse: We have another unexpected success, again driven by the desire of broadcasters not to replace but to upgrade. Another British company, Glensound, has sold more than 10,000 GSGC5 Commentator-Operated ISDN Outside Broadcast mixers, known as a COOBE, and we had requests from Sky, the BBC and others to fit our CallMe-T inside the mixer. So we developed CallMe-G, a fully integrated IP upgrade that has given a new lease of life to the huge installed base of equipment that was fast becoming obsolete as ISDN goes away.

Five Forty deploys Iqoya Talk

Portable IP audio codec from Digigram is an "all-in-one solution"

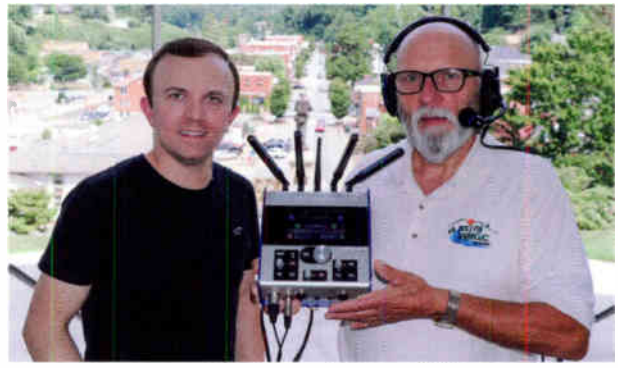
Andy Rogers, the operations manager for Five Forty Broadcast Company's WRGC/WBHN, said he relies on Digigram's Iqoya Talk as his choice for remote broadcast of live sporting events for football, basketball and baseball in the Sylva, N.C., area.

Before being introduced to the Iqoya Talk, the crew had to use three different pieces of equipment to accomplish the same tasks the Talk can do itself.

With the previous setup, the team was only allowed one service provider through a third-party device, but with the Iqoya Talk, Rogers said he can install two SIM cards directly into the device, ensuring a failsafe for redundancy.

No matter the level of technical understanding by talent in the field, Rogers can log into the web interface and control the Iqoya Talk remotely, allowing him to troubleshoot from anywhere at any time.

He called it an all-in-one solution. "I can be anywhere in the world, and if there's a change that needs making, I can adjust it remotely without the need to communicate with the talent in the field," he said.



Left
Operations Manager Andy Rogers and station owner Roy Burnette use the Digigram Iqoya Talk for sports.

"I no longer have to troubleshoot with someone on the ground who isn't a well-versed engineer. I have complete remote control and that is well worth the price of the product."

The audio is streamed back to the studio to a Digigram Iqoya X/Link, allowing the mixing process to be seamless and fast through the Iqoya ecosystem, delivering a low-latency live broadcast directly to terrestrial radio, websites and mobile apps.

More Info
www.digigram.com

A single-frequency network for Radio Coromandel

Broadcaster uses APT codecs, Ecreso transmitters to solve severe coverage difficulties

More Info
www.worldcoastsystems.com/en

The Coromandel Peninsula on the North Island of New Zealand extends 53 miles north from the western end and is 25 miles wide at its broadest point. A majority of its population lives on the narrow coastal strips fronting the Hauraki Gulf and the Bay of Plenty.

In clear weather the peninsula is visible from Auckland, the country's biggest city, 34 miles to the west.

The peninsula is steep and hilly and largely covered in bush. The Coromandel Range forms the spine for most of the peninsula, with the highest point at nearly 3,000 feet. It has a permanent population of around 30,000 and approximately 60,000 reside in the station's broadcast coverage area.

On securing a single FM license in one of the towns on the peninsula, the challenge for the station owners was how to maximize their investment by extending coverage into other towns across such a rugged area. The main competitor used no fewer than 12 frequencies to provide coverage in a similar area.

Radio Coromandel partnered with Auckland-based consultants Southern Broadcast, who developed a plan to deploy synchronous transmitters along the eastern coast. The NZ regulator later referred to this plan as an "efficient use of radio spectrum."

The station has four synchronous sites broadcasting on the same frequency. In order to carry IP traffic from the first transmission site to the four other linked sites the station established its own microwave radio network.

The system uses Ecreso Digital SFN-enabled FM transmitters and APT Digital MPX IP codecs with SynchroStream technology. The accuracy of SFN timing allows almost total elimination of "mush zones."

"The synchronous transmission works well and has become a very popular feature," said station owner John Grant. "Many listeners commented on how easy it is to stay tuned to our station that has seamless coverage down one entire coast and across hills on a single frequency. We could not have achieved this without WorldCast APT codecs and Ecreso transmitters."

Right
An Ecreso transmitter is seen in the middle of the left rack bay.

Tech Update

Moseley's NX-Gen-T Is High-Capacity Digital Microwave

Moseley's NX-Gen-T is a licensed microwave radio that transports a programmable mix of native T1/E1 and IP traffic separately. Moseley says it ensures a seamless transition from legacy TDM networks to an all-IP network.

"The NX-GEN-T split indoor/outdoor microwave STL/TSL is an economical advanced software-defined digital microwave radio that offers scalable configurations and the highest value in the point-to-point microwave marketplace," the company states.

Broadcasters can create an economical high-capacity IP Ethernet connection to the transmitter site and audio codec(s) to create a multi-station STL/TSL.

RF electronics mount directly to the antenna, saving indoor space and delivering maximum power into the antenna. The indoor/outdoor topology reduces installation costs in new systems by eliminating the need for expensive waveguide and accessories.

Info: www.moseleysb.com/products/nx-gen-t/

BROADCAST EQUIPMENT EXCHANGE

Consistent audio levels

Mark Persons' article about keeping consistent audio levels ("Does Anyone Know What the Correct Level Is," March 2 issue) hit it on the head.

We had the same problem in TV with our field crews as digital gear came in. Many thought the peak level was –18 and that you couldn't peak over that, so they undershot. Management wanted to know why the noise was so bad on field recordings, and editors had to crank the levels; after all it's digital. Problems were due to a lack of training on the new gear and unfamiliarity with the digital domain.

I was asked to train operators in proper levels. Unfortunately the cameras had a black scale on audio levels; it was hard for operators to see the full digital scale in bright light, adding to the confusion. I think it would have been less of a problem if we'd had a color display, but the cam operators got it.

The gear we used for training editors fortunately had tricolor displays. My mnemonic device was "If it's green, you're lean; mellow is yellow; and red you're dead." That seemed to stick with people and corrected many problems.

I used an analogy because of my experience with aviation visual approach slope indicator (VASI) lights on the runway: "Red over white, you're alright" and "Red over red, you're dead."

Thanks Mark for a great explanation of what goes on with the "new/old" audio levels.

Lou Sabatini, W9LRS

How to submit

Radio World welcomes comment on all relevant topics. Email *radioworld@futurenet.com* with "Letter to the Editor" in the subject field.

Once clipped, always clipped

I thoroughly enjoyed Mark Persons' article on audio levels in the studio. I just wish someone would write something like that for the recording industry.

As a field engineer for two major Christian music radio networks, I go to great lengths to make sure my stations sound the best they can, and it's super frustrating to have some incompetent recording and/or mastering engineers clip the daylights out of the audio. They say it sounds OK for the people listening to an MP3 on cheap earbuds. Well, not all of us are listening that way!

The L.A. guys still tend to do it right; the worst stuff comes out of Nashville.

Like Mark said, once it's clipped, it's permanently damaged. It seems like the majority of what we get is that way now. I know most of my fellow field engineers feel this way.

Scott Todd

Pretty lights

Hello, and thank you for Radio World. I enjoy keeping up with the new tech and techniques in radio today.

I just read Mark's article on studio levels. It brought back so many memories, especially from my college radio station. It seemed like they had 17 different standards for the same measurements. But we've all encountered this. Add in that most of the studio equipment was older than I was, and it was a fun time for everyone.

One summer, a fellow engineer and I did a major sweep and test of every piece of gear, right down to adjusting the tensions on the reel-to-reel decks. We also did a major facelift of the studios. (It's amazing what a can of spray paint and some scrap sheet acrylic can do.)

Everything was clean, working and running +4 dBm. We also updated the old Vu meters to LED readouts.

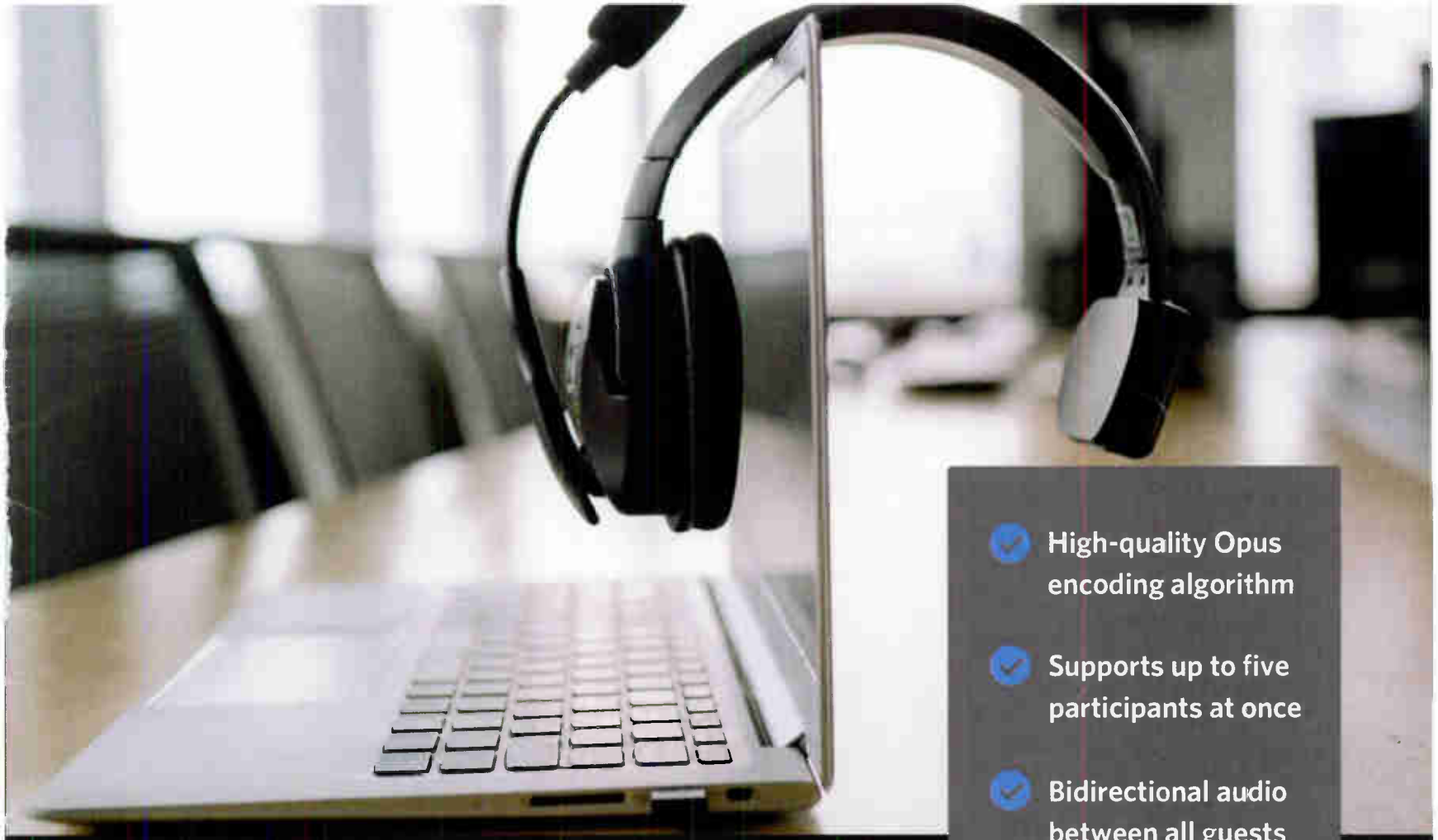
Later, when we were back in full operation, we heard some bad distortion on the office monitors. When we went to the air studio to find out what was happening, we saw that the DJ had the fader cranked up to 9. When I reached out and turned it down, the conversation was short, sweet and frustrating:

Me: Why are you playing that so hot?

DJ: So I can see the pretty lights you guys installed.

That's one studio level that you just can't adjust with a reference tape and a screwdriver.

Archie Stulc



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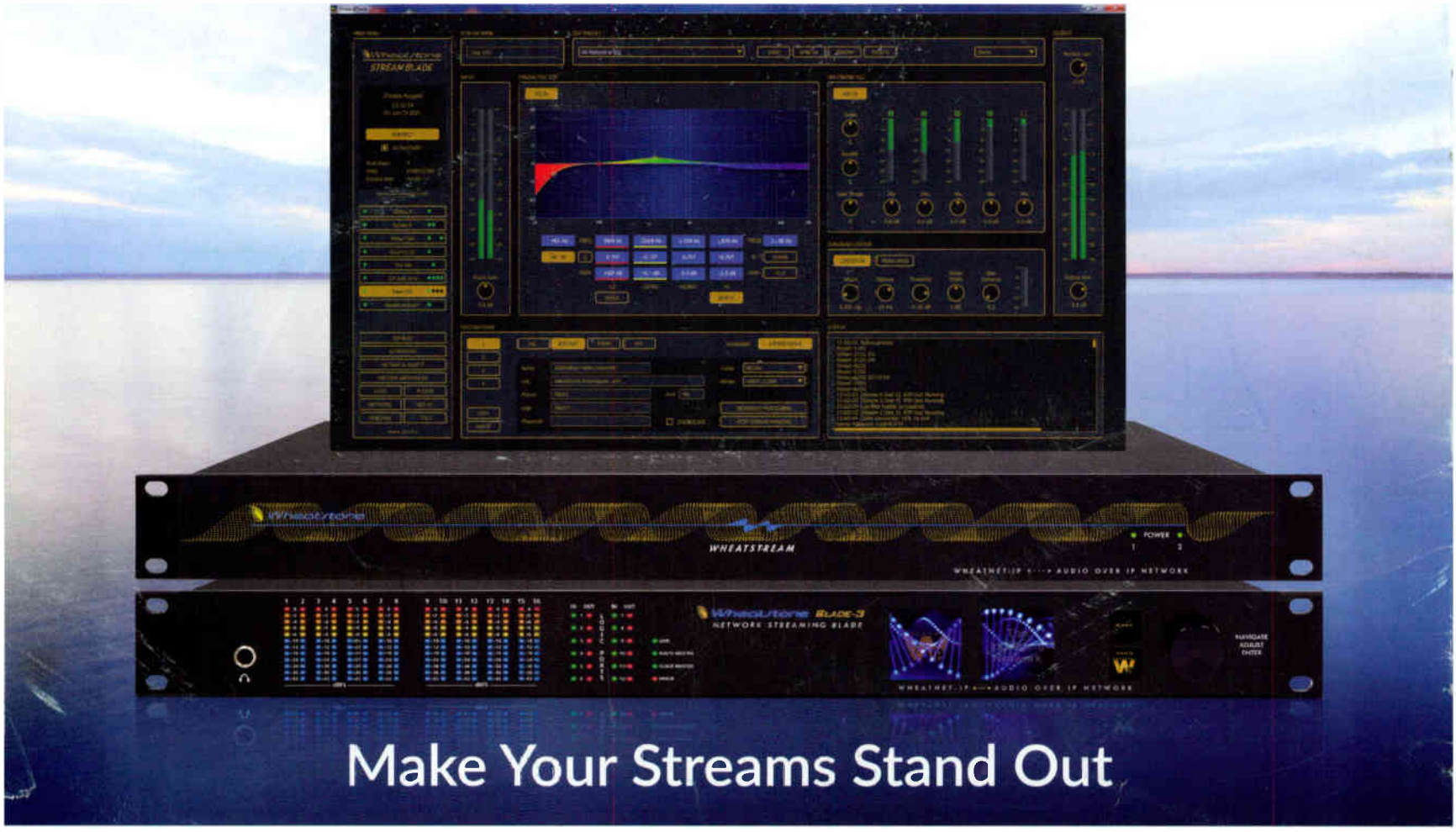

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