FUTURE

INSIDE "OVERHEARD AT NAT GEO" — Page 24

RADIOWORLD

SEPTEMBER 2, 2020 | The News Source for Radio Managers and Engineers | $5.00 | RADIOWORLD.COM

Blacks Are Few in U.S. Radio Engineering

Social justice movement puts spotlight on a lack of radio tech diversity

BY RANDY J. STINE

The recent swell of debate and social tension about race in the United States has brought additional focus on the experiences of Black radio engineers employed in the industry.

When news stories discuss the percentages of minorities in radio jobs, their focus is usually on ownership or radio business management. But the Black population is definitely underrepresented in U.S. radio broadcast engineering, most technology observers agree. Why that is, and what should be done about it, are less clear.

Radio World reached out to a number of African-American technical professionals who hold positions in radio or associated businesses to ask about their experiences in broadcast engineering. Some told us that Black engineers are sometimes reluctant to speak about their obviously low numbers in the field. Several engineers we contacted declined to be quoted.


Tokus Poole


Dave Antoine


Ben Hill

(continued on page 8)


From left: James Jenkins, principal of GCI; Tom Frank, superintendent of GCI; Jason Ornellas, project manager for Bonneville; Darrell Brown, president of Bonneville International; Chuck Bullett, director of engineering, Bonneville San Francisco; Kurt Kerns, principal of V-Three Studios; and Kyle Larson, project manager at GCI

They Built New Studios During COVID

Come inside Bonneville's open-concept, interactive AoIP broadcast facility in Daly City, Calif.

BY JASON ORNELLAS

Bonneville International Corp. currently operates 22 radio stations, four of which are now broadcasting from its new facility in the San Francisco Bay Area.

The Bonneville Bay Area cluster consists of four FM radio stations, each of which holds a special place in the community. They are 96.5 KOIT, 99.7 NOW, KBLX 102.9 and 98.5 KFOX.

Building a brand-new facility during COVID-19 is one for the books. Bonneville has since debuted this new open-concept, fully interactive, audio over

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Hunt Down Those PPoFs in Your Power Provision

Consider potential points of failure when seeking to "harden" your transmitter site

BY CHARLES S. FITCH, P.E.

A transmitter site is the narrow neck of a bottle — the departure point before the audience receives our product. At most stations, the site is remote from the program source and is unmanned.

"Hardening" the site must involve more than fencing and signs. If you're serious about your business and your signal, your plant must be robust, durable and capable of self-healing.

Generally speaking we have three areas of concern: security, functionality and provision. Each requires that you identify potential points of failure (PPoF); develop the best solution or methodology to strengthen or eliminate the weak points; and implement those changes.

Of the three, I am most involved in provisioning: Does the site have everything needed to operate properly, optimally and continually?

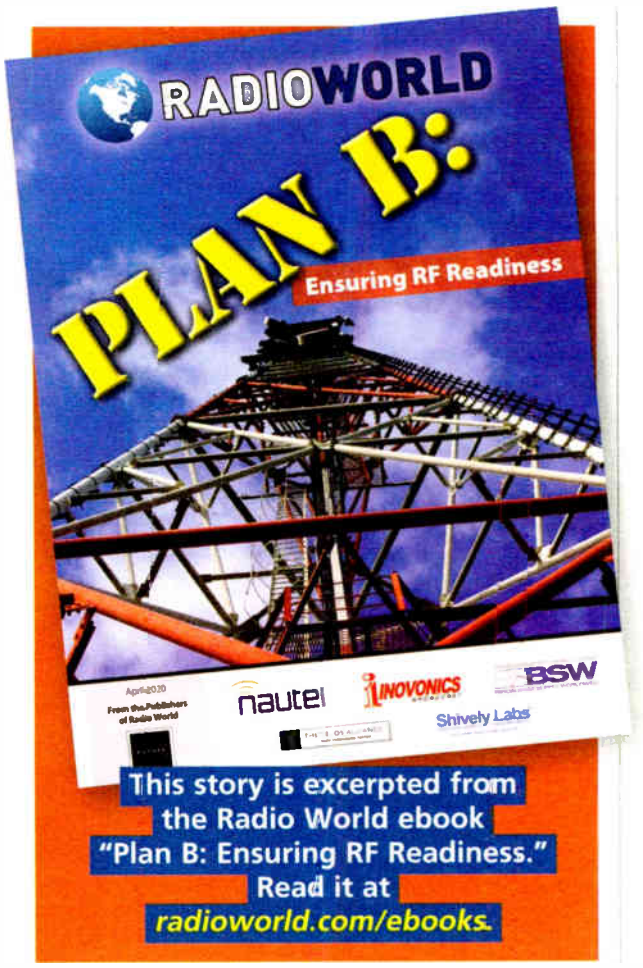
The list of items that could take you off the air is endless. PPoFs that might be found in any plant include poor system design or layout; equipment inappropriate or insufficient for the task; poor maintenance; and insufficient spares for items that wear and can fail without warning. Then are the many potential points of failure specific to a particular installation.

I have written it so often that we should use an acronym for it, but: *You cannot afford anything less than the best when that item is in the mainstream of your business.* One can skimp on office trashcans and amenities or client lunches. But if a piece of gear is in the air chain, it has to be the best and operating at peak. The audience knows a station by what it hears on the air; the signal and sound had better be terrific.

ASK YOURSELF

Some nuts and bolts of power provision:

Is your site getting its power from the best feed — not just the one that is most convenient for the utility?



Is your power tap on the neighborhood feed, or the area feed? The former can add thousands of additional feet of wire and dozens of poles to your circuit — not to mention that your plant may be on a common primary and secondary distribution, which means that your supply is very communistic; every fault and suffering on the system you will get as well, including noise, poor regulation, uneven phases.

Sometimes the solution is just to move your trans-

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Getty Images/JodiJacobson

Generators must be tested under load ... all the loads!

How Alabama Monitors the EAS System

Its SECC takes advantage of the ability of EAS units to export to an FTP server

BY LARRY WILKINS

The author is director of engineering services for the Alabama Broadcasters Association and chair of the Alabama State Emergency Communications Committee.

Broadcast engineers have a lot to look after, even before COVID-19. A successful station operation depends almost entirely on proper technical operation. From the studio to the antenna, there is a lot of "stuff" that must be installed and maintained.

One important item in the chain is your Emergency Alert System equipment. As with any type of technical system, it is important to have some type of monitoring system to ensure that every section is working properly. This also includes working with all the end users to clear up any problems.

SIMPLE SETUP

While there may be various ways for your State Emergency Communications Committee (see sidebar on facing page) to monitor an entire system, in Alabama we chose to take advantage of the ability built into most EAS units to export to an FTP server in real time.

It is a simple system to create and maintain:

- Set up an FTP server; most state broadcast associations have one running;
- Create a folder in the root directory of the server to receive the data;
- Have stations load the log-in information in their units.

Fig. 1 shows information loaded into the EAS unit. Every time the station unit has any EAS activity, it will transmit a report to the server.

We found an easy way to create a database to check the "health of the entire system." The data from the FTP server is copied into Microsoft Word; using the Find tab, the data can be separated by type of alert/test.

Currently we fill out the database manually; we haven't found any software yet that will do this. However, it

Fig. 1: FTP screen image.

May 2020

ation	City	AMBER	IPAWS	APT	APR	GSS Test	RMT	AMBER	AEMA
		5/2	5/4	5/4	5/6	5/6	5/7	5/8	5/15
PT	state wide	GSS/T	R	S		R	GSS	GSS/T	GSS
'AAO	Andalusia	WKMX/T	R				WKMX	WKMX/T	
'AAX	Gadsden	WJOX FM/T	R	R			WQSB	WJOX FM	
'AAY-TV	Huntsville	WDRM/T	R	R			WDRM	APT/T	
BAENG	Birmingham		R				IPAWS		
'ABD	Mobile	GSS	R	R	R	R	GSS	GSS	GSS
'ACQ	Tuskegee	IPAWS/T		R			IPAWS	IPAWS/T	
'AFF-TV	Huntsville	IPAWS/T					WZYP	WZYP/T	
'AFN	Arab			R					
'AHR	Huntsville								
'AJH	Birmingham	WJOX FM/T	R				IPAWS	WJOX FM/T	
'AKA-TV	Montgomery			R			IPAWS	IPAWS	
'ALE-LPTV	Montgomery	WLWI/T					WBAM	WLWI/T	
'ALJ	Tuscaloosa	APR/T	R		R		APR	APR/T	
'ALX	Selma	GSS/T	R		R	R	GSS	GSS/T	GSS
'AMI	Opp	IPAWS/T	R				IPAWS	IPAWS/T	
'API-AM	Birmingham	GSS/T	R	R			GSS	GSS/T	GSS

Fig. 2: Partial database.

THIS ISSUE

SEPTEMBER 2, 2020

Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by Future US, Inc., 11 West 42nd Street, 15th Floor, New York, NY 10036-8002. Phone: (703) 852-4600, Fax: (703) 852-4583. Periodicals postage rates are paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 282, Lowell, MA 01853.

only takes a few minutes each morning over your first cup of coffee.

Fig. 2 shows a partial database.

If you see that a station has been missing a certain test for several weeks, contact its engineer to check on the problem. The data received also include an audio file of tests, so it is easy to listen to the quality.

AUDIO QUALITY

The FCC recently issued a report on last year's national test, reporting that one of the main problems was quality of the audio. If a station is having a problem receiving quality audio from a source, the committee can work with the station engineer to correct the problem and, if need be, assign a different source.

The beauty of this system is that there is no cost to set it up, either to the station or or the state broadcast association, plus the speed of the response.

We recently had an agency issue an Amber Alert. After notification of the alert, we looked at the log and discovered that the text of the alert was missing. After a simple phone call to the origination agency, the alert was retransmitted, this time with the text.

If a station has EAS equipment that cannot export data to an FTP server, simply have them add a dedicated email in the unit. That way the committee can still get the report from that station.

Note that this monitor service is only for the state committee use in maintaining the system. It does not replace the legal requirement that the station chief operator review the station log on a weekly basis. That log is required to be retained for a period of two years.

Most state associations already have an FTP server available. It's simple to create a folder in the root directory where stations can load log-in information.

The author is a recipient of the Radio World Excellence in Engineering Award.

Comment on this or any article. Email radioworld@futurenet.com.

EAS COORDINATION IS ESSENTIAL

Not only is EAS participation required by the FCC, but it is a major community service for your listeners and viewers. At the station level, approved equipment must be installed and configured correctly. The commission requires that proper operation of the EAS system is checked once a week and logged in the station log.

As most readers know, a committee in each state, often named the State Emergency Communications Committee or SECC, is tasked with setting up a secure and reliable origination/distribution system to ensure your equipment receives the correct alerts and test. That leads to the creation of an EAS state plan, which all broadcasters and cable systems should follow.

The committee plans and oversees the entire EAS origination/distribution, plus closely works with FEMA and other state and national agencies.It's important to have representatives of all stakeholders participate. This includes your state emergency management agency, the National Weather Service, state broadcast association, state cable association and of course engineers from radio and television.

You can find a list of SECC chairs and links to state plans on the FCC website; do a Google search for "list of State Emergency Communications Committees."

— Larry Wilkins

Entertainment Content for the Connected Car

Consumers expect access to entertainment wherever they are

BY DR. NEALE FOSTER

The author of this commentary is CEO of Access Europe, which launched the first mobile web browser in the 1980s and now facilitates media consumption outside of the home and in the connected car.

As we enter a new era of driving experiences, basic radio and rather awkward bring-your-own-devices (BYOD) are unlikely to satisfy drivers and passengers as the only forms of in-car entertainment.

Today's consumers want access, when on the road, to all the services they currently use on their phone and at home. The car original equipment manufacturers all understand this and are evaluating the best way to deliver on the potential of the connected car concept.

As BMW board member Pieter Nota, suggests: "It's not just about having big screens in your vehicle, it's about the content you can have on those screens and what you can offer that's so important, in terms of things like the best possible integration of music in your vehicle."

The combination of smart software with stable 4G and advanced 5G cellular networks unlocks a future in which the car becomes an OEM-branded communications hub that offers entertainment, BYOD access and value-added services.

The relatively low cost of shipping 4G systems in a car has already prompted a rise in its inclusion in next-generation vehicles.

Around 75% of cars will be connected to the internet by 2025, and connected functionality has moved up the list of features consumers value. A 2018 survey by mobile app developer Metova found over half of consumers have a car that connects to the internet through their mobile device and 33% prefer streaming audio over radio largely due to convenience.

Meanwhile 66% of buyers are increasingly prepared to change their entertainment service providers and content packages for one that is available in their vehicle in order to gain better connectivity and seamless access to in-car entertainment.

5G MOBILITY BENEFITS

4G networks are already widely deployed and provide a pathway for high-speed connectivity across audio, compressed video and two-way communication for BYOD and onboard apps. In Europe, new car models approved for manufacture after March of 2018 must have the 112-based eCall emergency number system installed which uses a cellular modem within each vehicle.

Although 4G is ideal for streaming low-bandwidth content, the cellular connectivity that will be fitted into all new cars is likely to be 5G-ready — allowing a software/SIM upgrade to take advantage of new networks as they arrive to the market.

This move to 5G is more than just a gimmick; due to the short wavelength of 5G radio signals, cars with larger and better-integrated radio antennas will be able to transfer data at higher speeds with lower congestion at lower latencies and thus offer superior reception than that of smartphones. With the car acting as a reliable 5G access point, the ability to project a Wi-Fi hotspot for occupants provides increased reliability and performance across the entire journey for drivers and passengers alike.

With connectivity built in, automobiles finally gain several real-time capabilities that aid driver comfort, safety and utility — from instant updates for traffic and route guidance, to delivering new forms of infotainment such as streaming audio services and video for rear-seat passengers. 5G means, that for example, the car's Wi-Fi and its built-in in-vehicle infotainment (IVI) system will be able to seamlessly blend different audio inputs from national and local HD Radio, from across the world, to Spotify — and to a much greater standard than streaming directly from your mobile device.

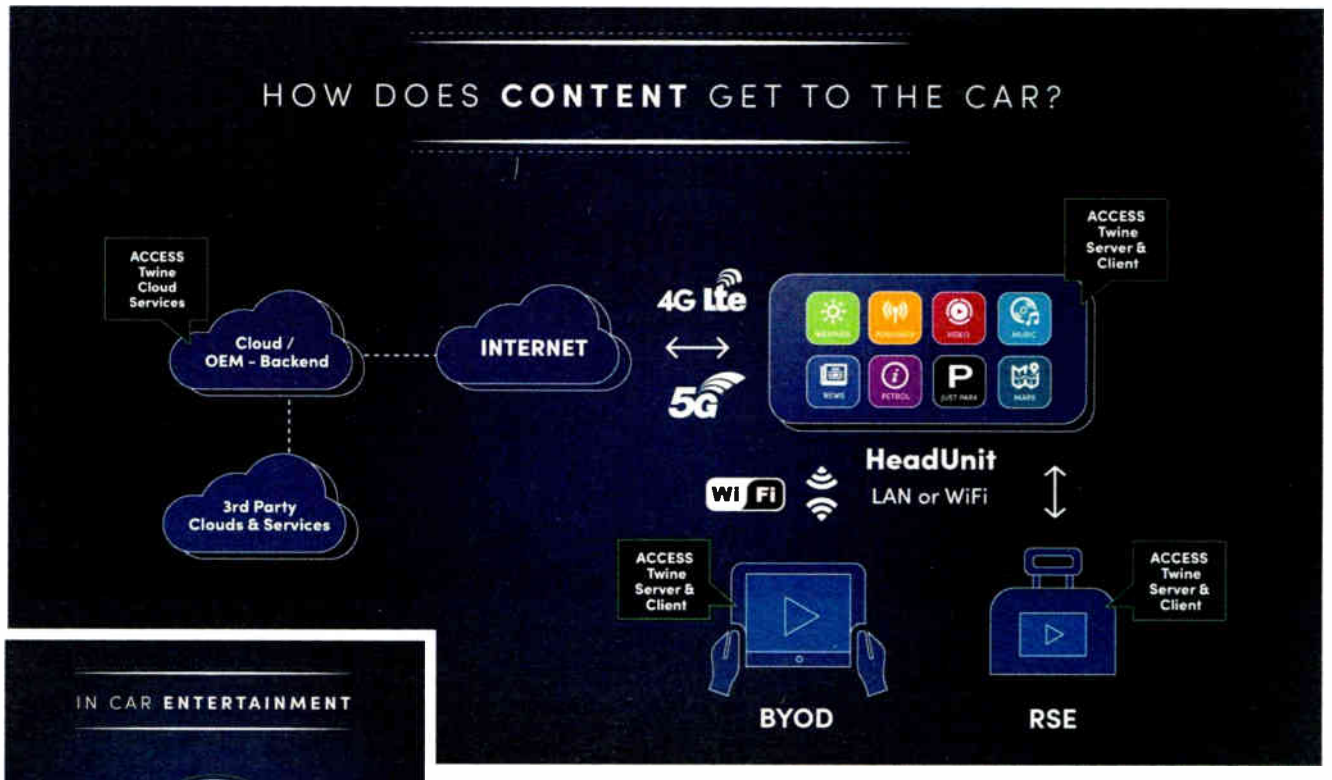
IVI acts already as a connectivity hub allowing various media formats — via Bluetooth and USB drives — to be merged into a single source of entertainment. The next-generation IVIs will also be a central access point to the services offered by the OEMs, allowing them to shape these in the most attractive and efficient way for the driver and passengers.

The connected car approach will also allow car brands to offer integrated infotainment services through partnerships with existing or emerging music and radio services. In a similar paradigm to the smartphone market, vehicles are likely to be a showroom with connected services that are enabled through activating pre-downloaded apps within the IVI — along with companion apps for mobile devices. This will play a key role in how car brands are perceived.

As the automotive and digital media industries continue to evolve, car manufacturers are recognizing that the key to differentiating themselves is in building digital and software-based services around the car. But the path to unlocking new relationships with drivers and building customer loyalty will be through entertainment and next-generation radio services.

This means that the way we use cars is about to change. And for the audio industry, this presents a unique opportunity to evolve its offerings, enter new territory and keep its services at the heart of the driving experience.

Comment on this or any article. Email radioworld@futurenet.com *with "Letter to the Editor" in the subject field.*



FAILURE POINTS

(continued from page 3)

former feed to the top conductors on a multi-circuit pole. If your power quality (PQ) is truly poor, you may need a separate feed from a cleaner, more reliable supply point.

How about your supply transformers? Properly grounded? If on a pole, properly supported? Properly GEP wired, or a mess of 14 neutral splices under a single wire nut? Phases balanced? Clean sine wave, or showing artifacts of square wave issues from overloading? Can you fry eggs on the top of your pad-mounted transformer when all the users have their HVAC running wide open?

Each of these defects indicates a potential point of failure.

GENSETS

Generators are the next line of power defense and involve their own maintenance requirements.

Periodic maintenance is a must. This is more than punching the date card on the attached tag.

Is your site getting power from the best feed — not just the feed that is most convenient for the utility?

Generators must be tested under load … all the loads! If one generator supplies all site users, all loads on that generator should be operated simultaneously on the generator for at least half-hour, every month.

With all loads present, is the voltage solid on spec, and not sagging when motors such as AC compressors start? Is the output frequency 60 Hz? Will it operate automatically in the event of any of the five critical failures (loss of phase; phase reversal; high or low line voltage; and total loss of power)? Are the block heaters running? If the unit is thermostat-controlled, is the thermostat functional and set at the appropriate coolant and ambient temperature?

No matter what, every generator should be exercised on a weekly basis for at least 20 minutes.

Batteries should be maintained on an appropriate trickle charger. The batteries themselves should be replaced on the recommended schedule of the generator manufacturer. If none is given, the batteries should be replaced on a three-year increment, but sooner if exposed to extreme temperatures.

Calculate the run time provided by fuel stored on site. Extensive backup generation may not be much help if you need it for days and only have fuel for a few hours.

For many reasons, keep fuel tanks as full as possible. Emulate cellular operators who place sensors on tanks to signal that a tank needs a fill. This level signal is usually a DC analog; your remote control can use this value as an alarm limit. When the tank is, for example, three-quarters full, you can call the fuel service to top off. A second value could be one-quarter full, so that you will be kept aware of how much longer the site can run during a long-term outage. One of my clients has a remote control with an action program that calls the fuel service automatically when either of these limits is reached.

All tanks should be protected from such dangers as falling ice, and secured firmly with fences and spill sumps. Locks on fills are a good idea, especially during times when diesel is expensive and liable to be siphoned from remote unsecured fuel tanks.

We mentioned spare parts. For to the generator, you should have at least two oil and two air filters on the shelf, as well as a set of fan belts and a complete change of oil plus a quart. You do not want to go hunting for these parts at 3 in the morning or when off the air.

For more on this subject, including past articles by the author on buying and installing generators, visit radioworld.com *and search "fitch generator."*

BLACK ENGINEERS

(continued from page 1)

"TREATED ME WITH RESPECT"

David Antoine is project engineer and support engineer for Lawo Inc., which designs and manufactures advanced networking audio controls.

He said his experience in broadcast has been mostly positive.

"My peers in the industry have treated me with respect. I enjoy a good name and reputation at this point in my career. I am on a first-name basis with many of the movers and shakers in the industry," Antoine said.

There have been some job opportunities for which he wasn't considered, though he felt qualified.

"However, I'm not one to play the race card. It may have simply been that they found a better, more qualified candidate. I do believe that it has been up to me to set my course and get what I need to position myself for the right opportunity when it comes along," he said.

One incident in particular left Antoine questioning the sincerity of a potential employer.

"There is a small radio group owner here in the tri-state area [of New York]. I applied for the chief engineer position when it was posted. I went in for an interview that turned into a three-hour get-to-know-you discussion. A few days later I received a letter from the GM thanking me for the time and the discussion, and that he was looking forward to us working together. As you can imagine I was very excited.

"I waited, one week, two weeks and three weeks. I put in a call to the station and was told 'the GM was very busy, did not remember talking to me and that the position was filled.' Needless to say, I was a bit stunned. I've had similar instances happen afterwards with other broadcasters. Same outcome," Antoine said.

A lack of inner-city curriculums teaching science, technology, engineering and mathematics — STEM — could be a reason for the ongoing lack of diversity in radio engineering, Antoine said.

"In my experience from years in the industry, my honest observation is there are not enough interested qualified candidates for the career field of broadcasting," Antoine said. "Broadcasting and AV does not pay as well as IT, web development, programming and related computer-centric fields.

David Antoine

"I have found it is hard to convince young people in general to look into the career paths on the 'cable side' of the microphone or camera. I find this to be true in a broad sense where race or ethnicity of candidates is concerned."

But Antoine, whose experience in the broadcast industry began in the 1970s, said it's time for further discussion of the state of race relations in this country.

"It is a shame that it took the video of George Floyd being suffocated to bring the conversation to the forefront and for some of the masses to realize that the discussion needs to be had," he said.

"DISBELIEF AS TO WHO I WAS"

Ben Hill, chief engineer for Entercom Communications station WIP(FM) in Philadelphia, said current social discussions leave him "hopeful and optimistic, but at times cautious and weary, hoping America will live up to its promises" when it comes to acceptance of all races.

"I have been on a number of Zoom meetings on race relations and church meetings discussing race and policing in America. I am suspicious of anyone who says 'all lives matter' so nonchalantly. The ongoing discussion along with action is very important," Hill said.

Hill, who has served 43 years in a variety of roles as an engineer, chief engineer and tech manager, said he has been in uncomfortable situations because of his race throughout his long career.

"I have gone to conventions and seminars and station tours, and it was surprising to many because I was the only black engineer they had ever seen. 'Who is the engineer?' they would ask, looking right past me, only to realize that the guy with his hand up was the engineer. This has happened on job interviews, at sports stadiums and at businesses and nightclubs where we were remote broadcasting.

"I make sure I have a station shirt or jacket and have my business cards ready to show with my ID. I have been stopped and questioned as to who I was at events and why I was there. I don't really remember many colleagues being grilled this way. Disbelief as to who I was an issue," Hill said.

Ben Hill

Hill says that at times over the years he has "felt prejudiced by some White colleagues," though he describes his experience working at CBS and Entercom as "excellent."

"I have been mentored by a number of great engineers and station managers over the years. In some situations I have felt I needed to be the very best and strive harder to be on par with their knowledge and expertise of the equipment," Hill said.

"That's why I always felt like I had something more to prove. Pressure to succeed in a White world is an issue for us of color."

> **I have found it is hard to convince young people** in general to look into the career paths on the "cable side" of the microphone or camera.
>
> — David Antoine

"WE STILL HAVE A LOT OF WORK TO DO"

Tobias Poole is another longtime veteran of the radio engineering ranks; he is operating director for noncommercial WRTI(FM) in Philadelphia. He manages all aspects of the technical operations of the station, including the installations of transmitters and repeaters across the Delaware Valley, including New Jersey, Harrisburg, Mt. Pocono, Pa. and Delaware.

Poole said while it is true radio engineering is predominantly White, he feels the industry is slowly changing.

> **I have been stopped and questioned** as to who I was at events and why I was there. I don't really remember many colleagues being grilled this way.
>
> — Ben Hill

"It is not like it used to be. Things have changed. Radio and TV now offer better opportunities for more minorities to enter the field; but we still have a lot of work to do," he said. "The best advice I can give is to pick the road you want to travel, make a pathway, and go for it."

Poole says current discussions including the Black Lives Matter movement are long overdue, both in broadcast circles and across the country. It helps to "open up dialogue that leads to change and opportunity for underrepresented minorities to achieve and succeed in the communications industry," he said.

(continued on page 10)

2020

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BLACK ENGINEERS

(continued from page 8)

Poole believes that the number of African-Americans in radio technical positions such as IT, production and studio engineering continues to rise, while the number of radio engineers has not.

"I wish I had a good answer for this, but it really could encompass a number of things. Business culture, unions, politics, race, lack of mentors, opportunity and beliefs could all play a role. I've heard stories about it over the years," he said. "Since the beginning of radio, minorities have been excluded, discriminated against, and encouraged not to get involved because the hiring belief was that broadcast engineering was not for them.

"Like so many industries, hiring minorities would have meant there would have to be an internal industry shift in how minorities were perceived, especially as it impacted their seeming proficiency in comparison to their White counter-parts. In radio, this could trickle down easily and explain why there are so few minorities hired," he said.

Poole, who holds a bachelor of science degree in communication from Ohio University, wonders if more career doors would have opened for him if he were White, but also notes an overall "ceiling effect" in his chosen field.

"On a different pathway, who knows? Perhaps I could say yes (to more opportunities). I had to train my mindset to overcome roadblocks like anyone else," he said.

Poole, who plans to retire at the end of this year after 33 years at WRTI, said his experience at the Temple University-based station has provided an excellent opportunity "to really share, teach, and mentor individuals from all diversities who might not have otherwise been given the opportunity to go into the broadcast business."

Next issue: What employers and industry organizations told us about diversity in engineering.

Comment on this or any story, including your own experiences regarding race in the radio industry. Email radioworld@futurenet.com *with "Letter to the Editor" in the subject line.*

Tobias Poole is shown in the WRTI Production Studio in the late 1980s, and recently at the PA control of Lincoln Financial Field.

Poole wonders if more career doors would have opened for him if he were White, but also notes an overall "ceiling effect" in his chosen field.

NEWSWATCH

C-BAND LUMP SUM GENERATES QUESTIONS

A lot of U.S. stations were asking questions in August about lump sum payments being offered for modifying their C-Band satellite hardware. For receive-only earth stations with a single-feed antenna, the lump amount would be about $9,000, and with a multi-feed antenna it would be just under $17,000.

Many broadcasters use such antennas to receive syndicated programming. The deadline for owners of qualified earth stations to decide whether to take the lump sum option is Sept. 14 after the FCC granted an extension requested by the SBE.

The background: An FCC auction in the 3.7–4.0 GHz segment is set for December. The FCC is moving earth stations in the fixed satellite service to 4.0–4.2 GHz, requiring a repack of FSS earth stations. New 5G mobile licensees will reimburse relocation costs of eligible, incumbent operators to move.

In July, earth station owners including many radio stations were given the option to submit actual costs for reimbursement or apply for a lump sum.

"We have been slammed to calls from cable TV companies and broadcasters, all asking for advice on filing for the lump sum," said John Joslin of satellite services provider Dawnco in an email to Radio World. He advised stations with questions to talk to their FCC attorneys.

Ira Wilner, chief engineer for Monadnock Broadcasting Group and Saga Communications in New Hampshire, thought the decision would be a "no brainer" for most.

He wrote to Radio World, "Most of the radio syndication providers on SES-11 [satellite] are staying put or changing frequencies to another transponder of same polarity. For those in the biggest urban centers who will see 5G turned up the soonest, installing the 5G waveguide mounted filter is a rather trivial matter," he said.

"For those not in the hottest urban areas there will be lots more time for future filter installation. Tweaking cross polarization and nudging aim to maximize signal quality can be done using one of the satellite receivers brought to the dish, or a spectrum analyzer if an experienced engineer is on staff, but likely won't be needed. That said, a 'ma-and-pa' station might want to not take the money and rather get full carefree service."

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GDTs vs. MOVs: Choose Carefully

Though MOVs respond more quickly, the higher capacitance limits their use

WORKBENCH
by John Bisset

Email Workbench tips to johnpbisset@gmail.com

For many of our readers, cold weather will be here before we know it; and this is inevitably when we find ourselves working outside around a tower. (Troubleshooting an AM antenna tuning unit after midnight comes to mind.)

Fig. 1 shows a really neat portable propane heat lamp to keep you warm outside this winter. Cumulus Regional Engineer Justin "J.T." Tucker found these dual propane tank-mounted heaters at a camping supply store; they are also available online. Search "portable tank-mount propane heater."

Single units are under $50, the dual element versions pictured are around $100.

Remember, even though they are equipped with a safety shut-off valve and tip-over switch, do not use these inside your transmitter building or any enclosed spaces.

We received a nice note from David Mathews, who created the "Moseley 6000 Series Frequency Change" video on YouTube that we described in July. Even if you don't have to change frequencies on that pair of STLs, David offers a number of useful tips should you ever need to get inside the boxes.

In his note, David reports a lot of "likes," so thank you, readers!

David tells us that he's a "sort of" retired assistant chief engineer with North American Broadcasting in Columbus. He plans on putting together future videos on other equipment.

Okay, Workbench readers: Any specific boxes you'd like to learn more about? And for the more seasoned engineers, here's a challenge to share your knowledge with others using YouTube. If you put something together, let me know.

Steven Karty saw the suggestion we shared from Paul Sagi to change out gas discharge tubes with metal oxide varistors inside your surge protection devices.

Steven reminds us to weigh the application and the equipment before making a wholesale change; although MOVs do respond more quickly than GDTs, the much higher capacitance of MOVs limits their use, especially on audio circuits.

There's no problem if loading up the lines being protected with lots of capacitors connected to ground doesn't degrade the signal. But many signals will be adversely affected by the extra capacitance, so MOVs are mainly used where the capacitance isn't a problem, like inside AC powerline surge protection devices, as Paul suggested.

Because MOVs and GDTs wear out with use, Steven suggests they be replaced periodically for continued protection. The failure mode of most MOVs is shorting and (if there's sufficient power available) melting. Although some GDTs may short, the failure mode of most GDTs is that their firing increases, so that they aren't providing any protection.

Thanks, Steven. All good points to consider.

Fig. 1: Portable propane tank-mounted heaters are great for outside work at your tower site come winter.

Gas discharge tubes are sealed devices with a gas mixture between two electrodes. When a high-voltage surge is detected, the gas ionizes, providing a short circuit to ground for the surge.

The metal oxide varistor performs a similar function. The resistance of the MOV changes with voltage, becoming a short circuit when a voltage surge is detected.

Both are shunt devices, "shunting" the high-voltage transient to ground, and hopefully protecting the circuit to which it is connected.

In addition to surge protectors, GDTs were used in several RCA transmitters to prevent surges from damaging components.

Tucked out of the way, this little glass tube, about the size of your finger, could sometimes short to ground, depending on the intensity of the surge. The resulting permanent short circuit certainly protected the transmitter, but also meant it would not run.

Kudos to RCA design engineers (Buc Fitch?) who mounted the GDT on a snap-in bracket so (like a fuse) it could be pulled out of the circuit and easily replaced. If you have one of these older transmitters, look for it; I've seen instances where some engineers would remove the shorted GDT, leaving no protection.

This only invites more damage, should another surge come along.

Louis Bornwasser, now retired, was an FM chief engineer in the 1960s and '70s. Later in his career he ser-

Fig. 2: Useful swag that every engineer can use, from Inovonics.

viced and manufactured equipment for motion picture theaters, "in the days before digital."

Louis writes to tell us that he has cleaned power cords, mic cords and air and garden hoses for 40 years using the kitchen dishwasher, though he admits that the idea we shared recently would not have occurred to him, though circuit board cleaners that he used in the manufacturing process are similar.

Louis adds: Do it without dishes.

Have you ever used a car wash to clean an old transmitter before moving it to a new location or frequency? Tell us about the experience.

Workbench contributor Marc Mann writes in to thank us for letting readers know about Inovonics and their really useful Radio Hero Swag Bag. The secret's out; Fig. 2 shows what Marc received.

If you missed the offer, there are still a few left. To request one drop an email to *sales@inovonicsbroadcast.com*.

Louis brings up a good point. Although I've never personally done it, I have heard stories of engineers using a car wash to clean an old transmitter before moving it to a new location or frequency.

One fellow laid the transmitter in the bed of his truck and took it through. Then, he turned the transmitter over and repeated the process. He told me he supported the transmitter on a few 4x4 blocks of wood, allowing the water to drain. He removed things like doors and relays and tubes, but it apparently worked.

Another took the transmitter to a do-it-yourself car wash. Using the handheld spray nozzle, he could reach into all the nooks and crannies to get years of grime out. I'm hoping that one or more of our readers who have done this can write in, and maybe include a picture or two.

My concern would be things like transformers, especially the high-voltage type! That's the last thing you want to compromise with water and soap! Leaving the equipment to dry in the sun for a week is probably "good engineering practice."

John Bisset has spent over 50 years in the broadcasting industry and is still learning. He handles western U.S. radio sales for the Telos Alliance. He holds CPBE certification with the Society of Broadcast Engineers and is a past recipient of the SBE's Educator of the Year Award.

Workbench submissions are encouraged, qualify for SBE Recertification, and can be emailed to johnpbisset@gmail.com.

Wikipedia Updates Radio Infoboxes

Make sure that Wiki info about your station is complete and correct

BY T. CARTER ROSS

The volunteer editors at Wikipedia are shaking up some of the information included in radio station articles. A new "infobox" — basically a sidebar that provides a quick overview of the article's subject — has been rolled out for radio stations.

The new template harmonizes the radio and television station infoboxes, reorganizing content and adding several new fields.

The station's facility ID automatically links to its LMS and public file database entries.

It went live on Aug. 8, although some maintenance edits were still being made to finish the migration after that.

Among the additions to the new infobox is a "licensing authority" field. For U.S. stations, if this is set to FCC and the station's facility ID is in the infobox, it automatically adds links to the station's LMS and public file database entries.

The documentation for the new radio station infobox, along with a listing of all the supported fields, can be found at *https://en.wikipedia.org/wiki/Template:Infobox_radio_station*.

Because Wikipedia pages tend to appear high in Google search results, it is worth checking your stations' articles to see if there is incomplete or missing information, both in the new infobox and the article.

However, take care in editing an article. Wikipedia's rules against promotional and paid editing are strict and it's easy for a company to run afoul of them.

Readily verifiable information, such as adding the station's FCC facility ID, RDS program service name or slogan to the infobox, will likely be uncontroversial.

Adding full program schedules and DJ bios to the article, however, will likely be reverted as too promotional. All changes to articles are tracked and connected to user accounts and/or IP addresses, so if edits are made from an IP address connected to the company, it may be flagged as problematic.

If significant information is missing from the page, consider posting something to the article's talk page, along with links for verification, and asking an editor to incorporate it into the article.

On Wikipedia, third-party sources are always preferred, so a newspaper or magazine article is a more trusted source than a station's website.

If a station logo is missing, one can be uploaded, but encyclopedia's rules about non-free images can be complicated. Unless a logo is released for public use under a Creative Commons license (basically relinquishing trademark and copyright rights), it must be low resolution and limited to use only in an article infobox. This can be another situation where asking an editor for help may be the best strategy.

For more information about how radio stations are included in Wikipedia, visit WikiProject Radio Stations at *https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Radio_Stations*. The project includes a list of Wikipedians working actively on radio station pages who might be willing to help make sure your station's page is complete.

The author is former editor of Radio World International.

City	Natchitoches Louisiana
Broadcast area	Natchitoches Parish
Branding	*The Demon*
Frequency	91 7 MHz
Format	College leading Alternative rock
ERP	255 watts
HAAT	50 0 meters
Class	A
Facility ID	49791
Transmitter coordinates	31°44'51 00"N 93°5'47 00"W
Callsign meaning	K NorthWestern State Demons (the school's athletic mascot)
Owner	Northwestern State University of Louisiana
Website	http://www knwdradio org/

Wikipedia's old infobox for radio stations.

City	Natchitoches Louisiana
Broadcast area	Natchitoches Parish
Frequency	91 7 MHz
Branding	*The Demon*
Slogan	The Music You Want from the Demon You Love
Programming	
Format	College/Alternative
Ownership	
Owner	Northwestern State University of Louisiana (NSU Board of Trustees)
History	
Founded	1972 (carrier current)
First air date	September 30, 1975
Former call signs	KNSU-AM (carrier current)
Former frequencies	640 kHz
Call sign meaning	NorthWestern Demons
Technical information	
Licensing authority	FCC
Facility ID	49791
Class	A
ERP	255 watts
HAAT	50 meters (160 ft)
Transmitter coordinates	31°44'51 5"N 93°5'47 5"W
Links	
Public license information	Profile LMS
Webcast	Listen live (via TuneIn)
Website	knwdrad o org

Wikipedia's new infobox for radio stations.

How to Do a Pledge Drive From Home

The Public's Radio, aka Rhode Island Public Radio, conducted its first pandemic-era pledge drive this summer.

Aaron Read, the organization's IT and engineering director, wrote an extensive discussion of the challenges involved and how the team solved them.

This is an excerpt; you can read the full article at radioworld.com, search "pledge drive."

A surprisingly difficult problem proved to be behind-the-scenes communications between the pledge producer and the pitchers [the people listeners hear on-air during the drive].

In the studio, this is easy; our intercom system allows the producer in Studio A to talk into the one ear of the headphones for any one of the four mics in Studio B. We don't have that luxury here, so we had to homebrew it using the Zoom internet-based conferencing system.

We picked up a bunch of cheap earbud headsets with a 3.5 mm TRRS plug. I got iHip APP3s for $10 each at Walgreens. The idea is you wear one earbud, then put your beyerdynamic DT290 headphones on over it. Sound quality doesn't really matter, here ... all that matters is comfort when you've got closed-ear headphones over the earbud in the same ear.

Aaron Read's laptop with the Zoom conference. "This is where two monitors is very handy," he wrote. "The countdown timer is actually a shared screen from James in the studio — I just resized the window to allow for room for the chat window, too. Faces are blurred because radio = no pictures."

The pledge producer hosts the Zoom call (we paid for a pro account for the station), and mutes everyone. Everyone stays muted while the pitchers are live; the Zoom is only for use in between breaks or during emergencies. We even had people intentionally unmute while "pitching" in a dry run, so you can hear how amazingly distracting it is to have someone talking in your ear while you are also trying to talk.

We made sure everyone knows how to use the "hold down the spacebar to unmute" trick in Zoom. (Pro Tip: you have to select the Gallery window of Zoom first before the spacebar trick will work!) I also distributed a quick guide to the common broadcasting hand gestures so the producer can use them in the video part of Zoom.

The real hell of this was Windows 10. Its efforts to "manage" sound devices are absolutely execrable, and we spent a lot of time making sure everyone's laptop was correctly auto-sensing the earbuds being plugged in, and then Zoom using the earbuds for the mic/headphones. It really wants you to just use the laptop's speakers and mic array ... but the problem is it'll feedback over the Comrex links if the pitchers use that method.

How AI Helps Create Natural-Looking Video

Stan Walbert is CEO and marketing director of MultiCAM Systems. The company uses an AI algorithm to choose the best video camera presets based on who is speaking, then emulates how a human operator would switch. A longer version of this appeared in the Radio World ebook "AI Comes to Radio."

Stan Walbert

Radio World: *What does the term "artificial intelligence" mean for your company?*

Stan Walbert: Radio stations are now considering themselves as "content creators," and they need to be able to deliver content in the most interesting form for their audience. Nowadays that means video first, in an increasing number of cases.

Since people don't have the resources to do everything by themselves, they need to rely on AI to help create natural-looking video that engages the audience. The AI must act as a human would do to make the content interesting. The shots must look natural. What stations really need to avoid is setting up something that is boring with very few shot angles, or something where the shots are jerky in movement.

There is a big difference between dummy algorithms, macros and scripts, and AI. AI is the only one that can provide videos that make the show look natural. When you watch stations that use MultiCAM to create their visual experience, you will find you end up focusing on the video content and not the fact that it is "video for radio." That is because of the AI, because it helps the station create something that you would normally need an entire camera crew and director to create.

RW: *Give an example of how using this AI changes the workflow.*

Walbert: With MultiCAM radio, you can create entire programs without additional staff needing to be involved in any of the day-to-day workflow. This is groundbreaking technology because it allows radio stations to compete for content creation in both video and audio areas. In the past without our technology, there may have been a static camera shot or a few camera movements. The novelty of that wears off quickly.

In my opinion, what we are producing with automated almost works better than someone being there could. The reason for this is that AI allows the cameras to respond immediately; and frankly, no human could keep up with that. AI allows the station to avoid what we call "Aquarium visual radio." This is where it is a static shot.

RW: *Describe the development process.*

Walbert: We spent a lot of time thinking about how we ourselves did this in our production work. For example, we would never as humans pick two shots with the same angle to follow each other. We emulated the rhythm of how a director would act, and we implemented that. We studied this extensively because we ourselves are from the broadcast production background, so we have looked at how these shots are made. We combined that with our knowledge of robotics and automation.

We are at the very beginning of where this technology can take this industry.

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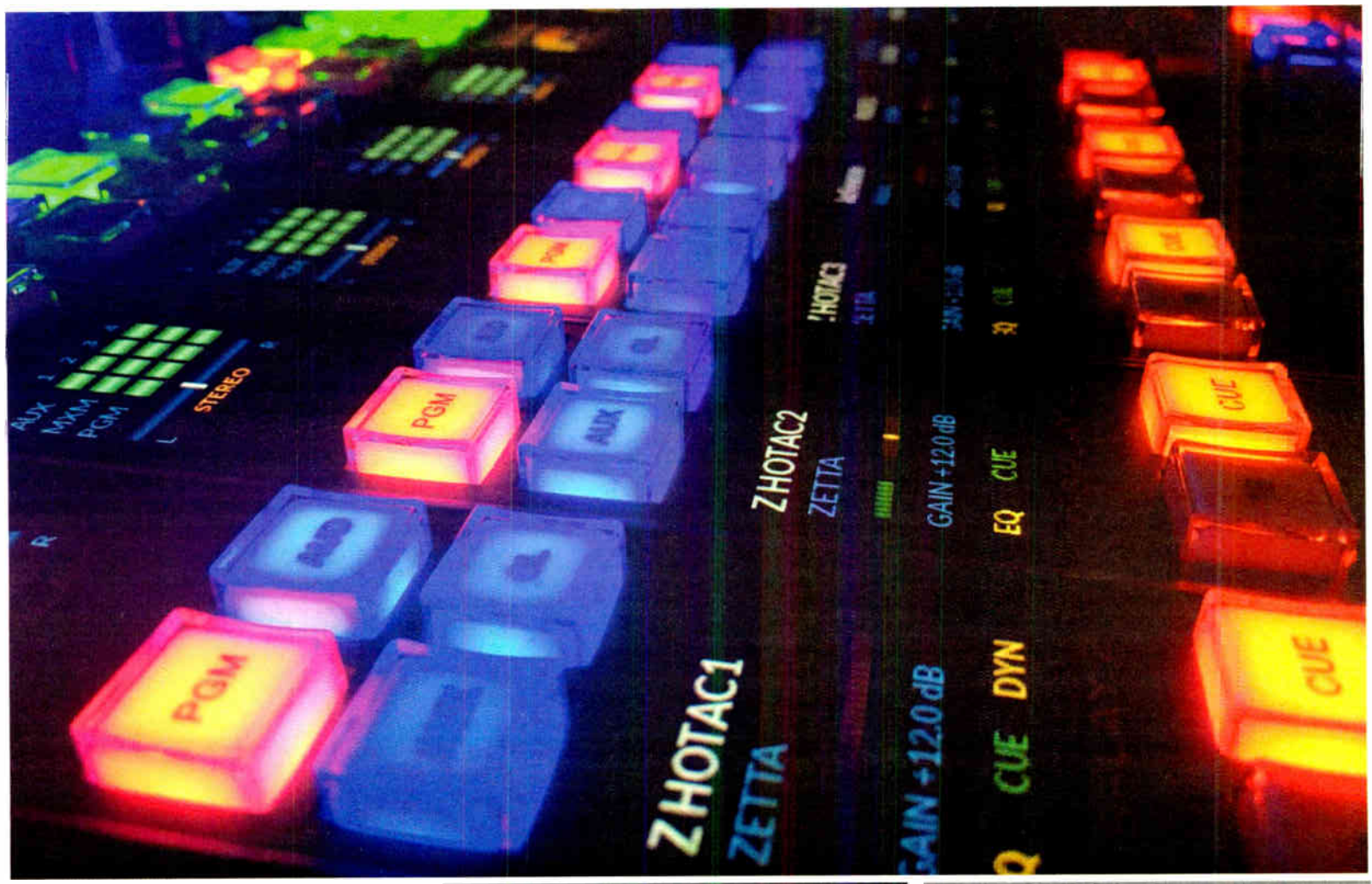
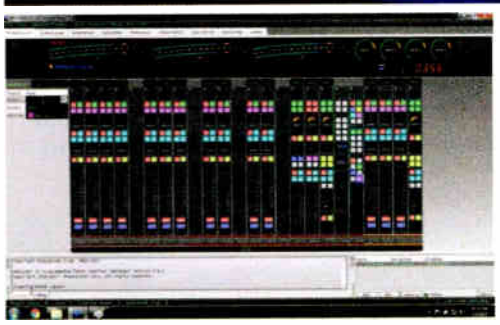
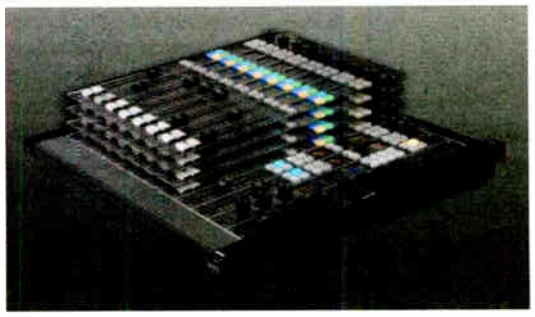
LXE...Make it Your Own







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ScreenBuilder – Create custom touchscreens
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BLADE-4 COMPATIBLE

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BONNEVILLE

(continued from page 1)

IP broadcast media plant in Daly City, Calif. It is a showcase, with high-quality construction, from the beautiful design in architecture to the technology deployment of Bonneville's engineering team.

While this move from the SOMA District meant losing our old penthouse views of downtown San Francisco, we left behind a dated facility and layout. The new design was well thought out prior to construction and creates an experience for our listeners and clients, as well as a collaborative space for our employees.

BLANK CANVAS

At the start of the project, the new suite, formerly used by Avid Technology, still had edit bays but the rest of the existing space had been completely gutted back to concrete.

This facility is built for the future, with its planned flexibility in the technology infrastructure and the office/studio environments.

— Kurt Kerns
V-Three Studios

We brought in V-Three Studios as the design and architects to create our vision on a blank canvas. V-Three Studios specializes in spaces that meet technical and functional demands while maximizing aesthetic appeal and respecting environmental and civic contexts and achieving their client's unique goals.

Our contractor GCI Inc. is a premier Bay Area commercial general contracting firm specializing in building and site renovation, infrastructure, labs and tenant improvement with a focus on sustainability and LEED.

Bonneville's construction and design team was led by Scott Jones, senior VP of engineering and technology (corporate); Carl Gardner, SVP and market manager for San Francisco; Chuck Bullett, director of engineering for the market; and myself, the director of engineering for Bonneville Sacramento.

I was tasked as the project manager to oversee the cutting-edge renovation of a floor in an existing building in the Daly City area, as well as the integration.

Having worked with all the vendors in the past on numerous other projects made for a smooth transition from San Francisco to Daly City, given the circumstances Bonneville was up against.

The new 18,000-square-foot facility is exactly what Bonneville was looking to achieve, with a high-tech performance space, a multipurpose break

(continued on page 20)

A gorgeous first impression. Visitors are greeted with views of the Technical Operations Center, right, and a showcase air studio for 99.7 NOW.

Scalloped positions and outside greenery make the talent more comfortable at 96.5 KOIT.

102.9 KBLX. Note station logos on cabinetry legs.

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BONNEVILLE

(continued from page 18)

room, a roof deck and the latest technology and digital integration for both broadcast and employee workspaces.

Beyond the visual elements throughout the suite, with both graphics and branding on video displays, the work area for non-programming employees features flexible seating arrangements known as a huddle space, as well as a mesh corporate Wi-Fi network to allow seamless flexibility. Studios were assembled in record time and the office furniture delivery and assembly went off without a hitch.

"In recent years, we have had numerous studio projects with Bonneville San Francisco, Salt Lake City, Sacramento and Seattle in 2011," said David Holland, the chief design officer at Omnirax.

> **This facility is built for the future**, with its planned flexibility in the technology infrastructure and the office/studio environments.
>
> — Kurt Kerns, V-Three Studios

"This project really was the confluence of the dream team — V-Three Studios and Bonneville Construction Team — and everyone involved was committed to make this facility a showplace collaboration. Scott visited Omnirax a couple of years ago at our showroom in Sausalito. Seeing our curved open plan and private office furniture, he immediately 'got' what we have been doing with our WeDesk line. This provided the entrée to allow Omnirax to bid on and then furnish the entire facility for Bonneville."

NATURAL WOOD, NEUTRAL COLORS

As guests enter the facility, views of a "showcase" on-air studio for 99.7 NOW greet them, as well as a display of the technical operation center for which engineering is responsible.

Also visible from the lobby is a performance space fitted with a stage and truss with lighting, a sound system, a movable front-of-house station, and adjacent audio and video control rooms. This gives visitors a sense of what goes into making modern day media and shows off the new digs.

Glass blankets the suite to allow natural light throughout, and the interior is set against the exposed concrete floors and finished with natural woods. A neutral color scheme was designed to enhance the LED cloud lighting for color to flow throughout ceiling grid of the suite.

The enhanced finishes, flow, continuity and efficiency now rival that of any modern office and multimedia facility.

"This facility is built for the future, with its planned flexibility in the technology infrastructure and the office/studio environments," said Kurt Kerns, principal at V-Three Studios, LLC.

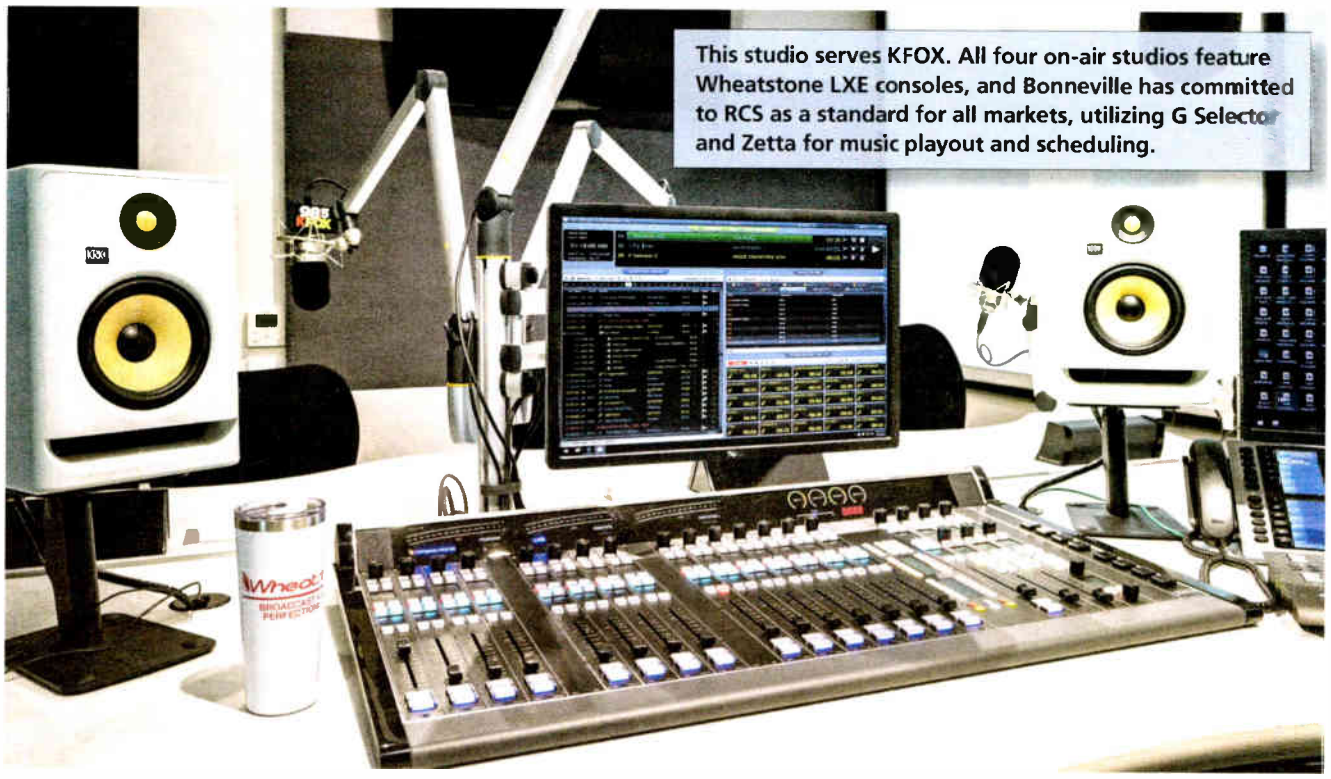
"As the broadcast industry continues to evolve in the digital age, the facility will be ready to adapt to the changing needs of the business model."

Moving away from traditional office design and having less square footage, the open office layout dramatically improves the openness and visibility of the facility with a focus of huddle areas to promote collaboration and interdepartment interaction.

END OF MAY OR BUST

Completion had been targeted for spring, with business commencing on April 13. Then the world got hit with a pandemic.

The project had been proceeding seamlessly and on schedule when the virus hit, right after delivery of the studio furniture. The project was just three weeks away from completion when lockdown went into place. A waiting game began for of all parties trying to find a solution to proceed cautiously.



The studios are inside DC Station on Junipero Serra Boulevard, a nine-story, multi-tenant LEED-EB Silver office tower with bay hill views.

Bonneville faced an additional challenge of its lease ending at its prior facility, which needed to be fully demised by the end of May.

The company was prepared to reopen the job site and resume construction with multiple shifts, subject to GCI's site-specific plan for COVID-19 prevention and remediation. Kudos to GCI for a detailed plan and a full decontamination team to sanitize the site before remobilizing.

As GCI got back on site, we saw requirements for more additional notification, site signage and other added protocols. GCI's safety and field teams, along with the industrial hygienist, walked the site with no indications that there would be any problems.

Visual inspections and site practice demonstrations went extremely well. They went through every process of the competent person training, site deliveries, subcontractor management and work procedures. Bonneville had a team of engineers from Salt Lake City, Seattle and Sacramento, waiting to fulfill the integration needs.

Kitchen area.

It is a testament to the trust amongst all the stakeholders, including GCI, that all were all able to weather the extended break and resume the project once the authorities deemed it safe to return to work.

AOIP FLEXIBILITY

The team of Bonneville engineers built 11 studios, four on-air, with adjacent support rooms, a main production studio, and two voice-tracking booths.

The backbone of Bonneville Bay Area now runs off Wheatstone, with its

(continued on page 22)

BONNEVILLE

(continued from page 21)

WheatNet-IP architecture, allowing any studio to be utilized for any function of the business. All four on-air studios feature the LXE consoles, and the eight production, support and voice tracking booths are equipped with L-8 consoles.

Various flavors of I/O WheatNet Blades plus multiple M4 and M1 microphone processors, Yellowtec mounting systems, KRK Rokit 7 Gen 4 monitors, and Telos VX enterprise studio phone system round out the broadcast infrastructure.

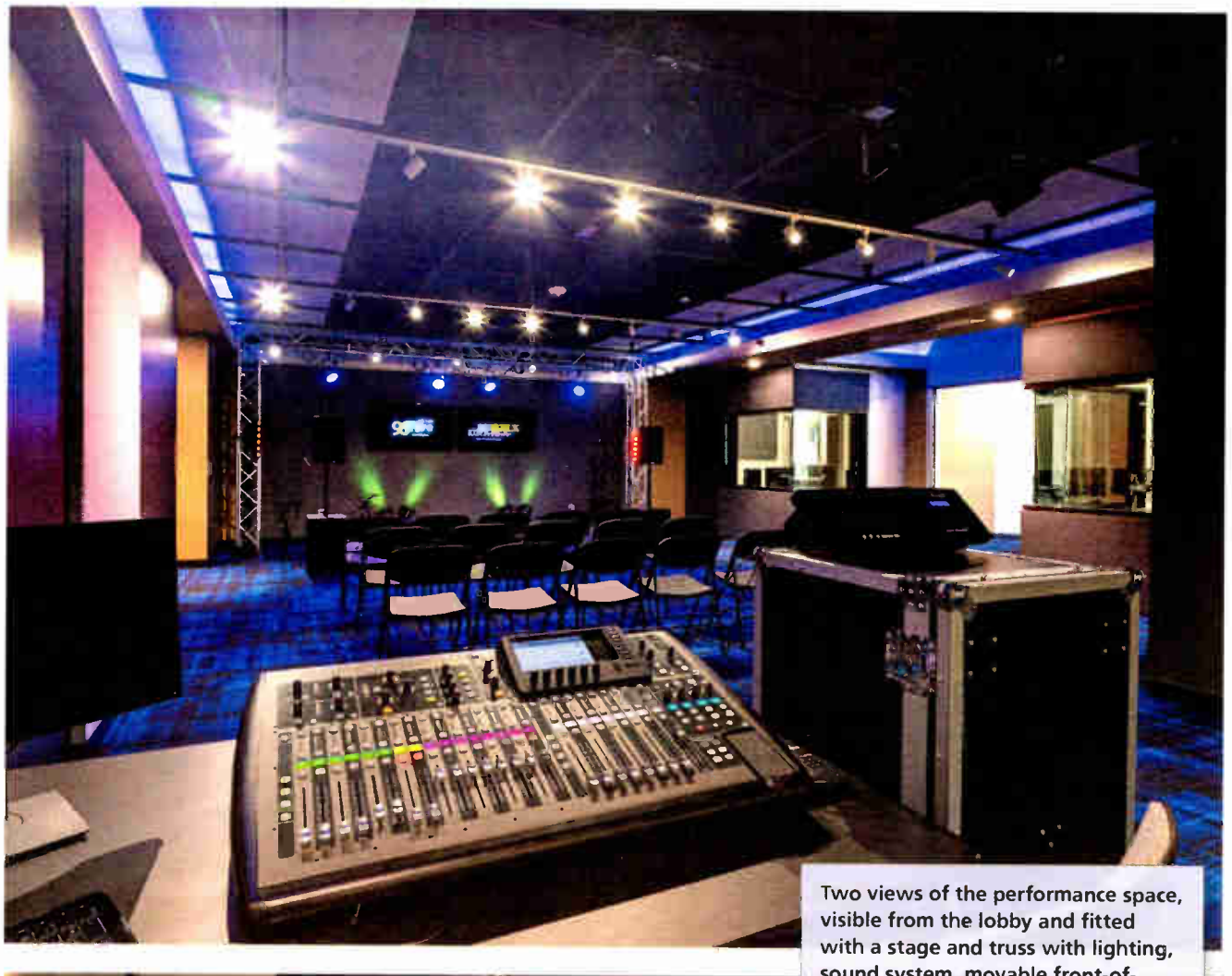
Also, during this transition, the cluster had an automation transition to throw into the mix. Bonneville has committed to RCS as a standard for all markets, utilizing both G Selector and Zetta to handle the music playout and scheduling functions. The Field Tech Services team of RCS did a lot of work prior to arriving for the cutover and made it a

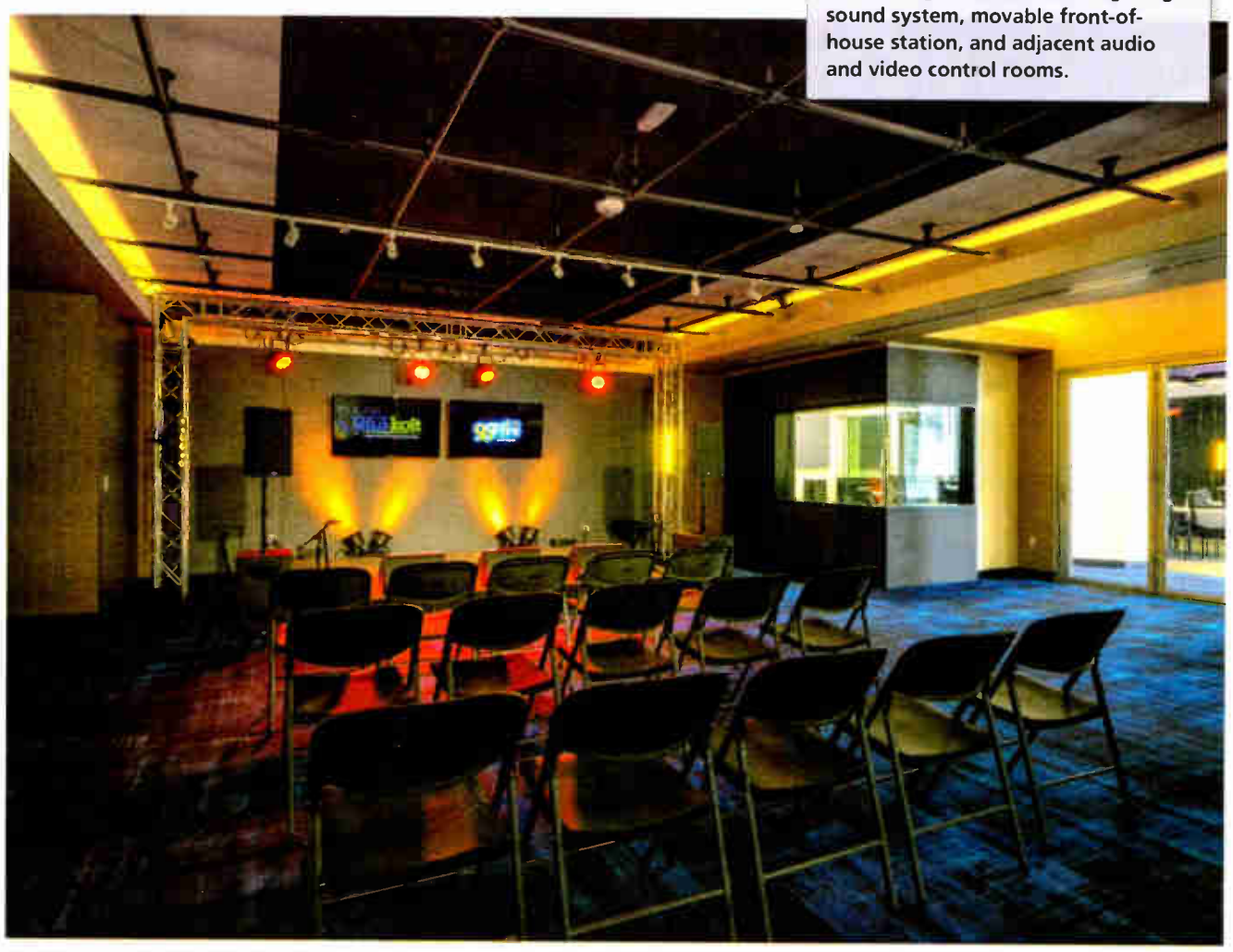
The team of Bonneville engineers built 11 studios, four on-air, with adjacent support rooms, a main production studio, and two voice-tracking booths.

smooth transition as the stations began to operate from their new spaces.

The Technical Operation Center at the previous facility housed 30 racks, and our new space has 14. We went with in-line CRAC (computer room air conditioning) units with an HVAC unit in each row creating a hot/cold aisle like a data center. A great amount of thought went into rack placement and layout, with a standard of color-coded cables all leading into a master patch panel that interconnects the whole facility, making it extremely versatile.

Bonneville wanted the glass-enclosed TOC to be on display with all the lights





Two views of the performance space, visible from the lobby and fitted with a stage and truss with lighting, sound system, movable front-of-house station, and adjacent audio and video control rooms.

Station branding is integrated into the design.

and meters visible from the lobby as people enter the suite. Bonneville's integration team of engineers moved into the TOC and studios to receive and rack equipment and begun cabling the space from start to finish in record time.

UNIFIED LOOK

The result of this collaborative design effort is a space that has a unified look that extends from reception, studios and conference spaces, out to groups of open-plan desks and private offices. We are excited to put this facility on display and ready to have it filled with our employees as soon as it is safe to do so.

"The leadership team at Bonneville dedicated a serious amount of time to work with V-Three Studios in the planning stage of the project," said Kurt Kerns of V-Three. "That kind of early input makes for a well thought out facility and minimizes the potential damage further down the road while building such a complex technical facility."

Bonneville wishes to thank all the vendors and partners that went above and beyond for this project, as well as the dedicated engineers from out of market who contributed a significant amount of time to the build. This is a huge technical success that accomplished Bonneville's goals and exceeded all expectations.

Radio World welcomes proposed facility profiles including studios, RF plans and other technical infrastructure. Email radioworld@futurenet.com.

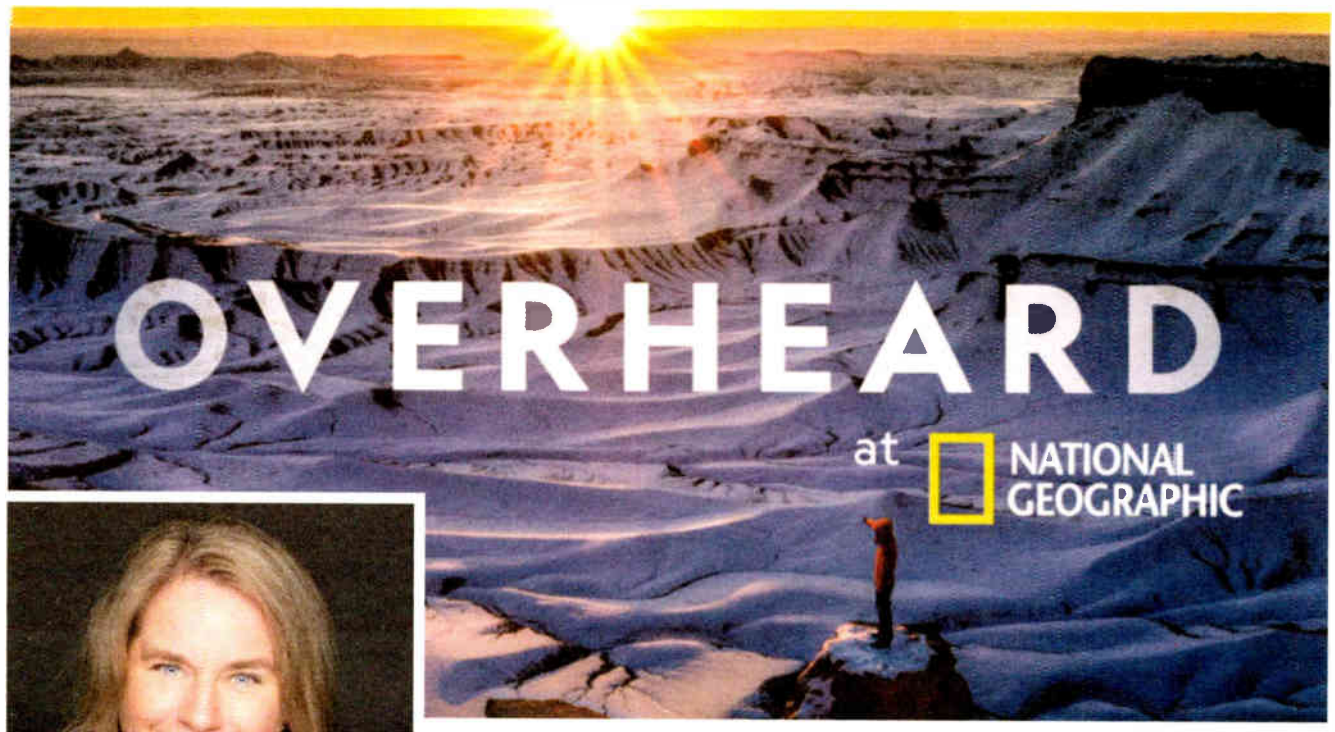
Producing "Overheard at National Geographic"

Gathering field audio from exotic locales is just another day at the office

BY JIM BEAUGUZ

Smuggled dinosaur bones? Scuba diving under a pyramid? Binaural audio recording onsite? It's all part of the third season of the "Overheard at National Geographic" podcast. For its production team, gathering field recordings from exotic locations and subjects is just another day at the office.

"It's hard to be in the [National Geographic] office for five minutes without immediately seeing there are a million stories out there to tell," says producer Brian Gutierrez. "You walk around, and there's an archivist who's recording old transcripts of Jacques Cousteau. There are people coming back from remote islands [and] writing about volcanoes and earthquakes. It's almost impossible to not tell this to other people in the way that we've been doing it on Overheard."



Amy Briggs, co-host and executive editor of "Overheard at National Geographic."

CAPTURING THAT FIELD SOUND

Hosted by National Geographic writer and editor Peter Gwin and executive editor Amy Briggs, "Overheard at National Geographic" tags along with explorers, photographers and scientists who uncover unlikely and unheard stories from the edges of the world.

"The tone of the show," Gutierrez says, "is, 'Hey, the world's a big, amazing, crazy place full of interesting, fascinating stuff I bet you didn't know.'"

Often, no one is closer to these tales than the journalists themselves. That's why, after wrapping the first season of the podcast, the team began training them to capture audio so the podcast could piggyback on location stories the magazine and television channel produce.

"One of the learnings we took away from season one was, 'How are we going to push the show further, and how can we think of ways to incorporate more of that field sound into the show?'" says Whitney Johnson, director of visuals and immersive experiences at National Geographic.

By outfitting journalists with handheld recorders like the Zoom H6 and Roland R-07, they're able to bring back audio that puts listeners in the adventure right alongside them. Sometimes audio comes from less conventional sources, such as a GoPro camera that captured underwater sounds used in the episode "Scuba Diving in a Pyramid."

But when they get the chance to go into the field themselves, the production team takes advantage of the opportunity.

"I went to a warehouse in Queens [New York] where a paleontologist had dinosaur fossils given to her by Homeland Security because they had been illegally shipped to the United States," says Gutierrez.

"Just following her with the recorder and letting her tell her story, I think brings you into the moment more than just being in the studio."

BOUNCE-BACK

Gutierrez embraced the challenge of creating a sense of place, even in a nondescript location like a warehouse. He pointed a shotgun microphone at a wall to get audio bounce-back when he interviewed the paleontologist, and used binaural omnidirectional condenser mics from Core Sound while walking through the spacious, Raiders of the Lost Ark-like trove.

"They're these little microphones that are the size of medicine pills, and I clip them to the sides of my hat," he says. "There's this sort of 3D effect of being in a space, because the microphones are literally where your ears are."

The hosts track their narration with Shure SM7B mics when they can record in the studio, but currently they both use a Zoom recorder and Sennheiser ME66 shotgun mic at their homes. Gutierrez works with two additional producers on each episode, which takes about six weeks from concept to completion.

Although the podcast plays off adventurous themes like the ones National Geographic magazine has explored for more than 130 years, the podcast creators set out to fulfill a different kind of mission in the audio medium.

"We were really interested in trying to develop a show that held on to the ethos of what makes a great National Geographic story — a commitment to really immersive storytelling and great characters—but [also what] was really appropriate for audio," says Johnson. "We knew we were not trying to make the audio version of a magazine story, and that we had to create something that was unique and deliberately [a] podcast."

This story originally appeared in our sister newsletter Podcast Pro.

WHO'S BUYING WHAT

CV Radio in Valencia, Spain, has new studios, according to manufacturer AEQ. There are three studios connected via AoIP including one that features a custom table in the shape of a "C." See more photos of this project at *www.radioworld.com/tag/whos-buying-what*.

Radio data technology company Quu announced a deal to provide Salem Media Group with "ad sync" services on 28 FM stations in 17 markets. Quu offers services to let radio stations manage RDS/HD in-car stereo displays with an eye toward revenue and a better listener experience. Beasley Media Group is among its investors.

Crawford Broadcasting installed a Nautel GV20D FM transmitter and Nautel HD Multicast + Importer/Exporter at its HD Radio stations WRSB and WPWX in Chicago. The transmitter will fulfill backup duties. Chicago Engineering Manager Rick Sewell stands with his new box.

Wheatstone Quickline Counters Florence's Flood

Modular furniture line allows Curtis Media to get studios back on the air quickly

USERREPORT

BY RICHARD BANKS
Regional Director of Engineering
Curtis Media

NEW BERN, N.C. — Hurricanes are common occurrences in the Carolinas at this time of year.

Two years ago, a big one even by Carolina standards hit. Water from the Neuse River spilled into Curtis Media's facility in New Bern, depositing 36 inches inside our studios. The consoles, the equipment, the furniture, all the wiring was completely awash in soot, debris and floodwater pushed inland by Hurricane Florence. Even the backup generator was lost to the flood.

Then the water receded and the real nightmare began.

The entire building four feet up needed to be stripped to the studs and miles of wiring needed to come out. Very little was salvageable, except the server containing music and automation that I had placed high on a shelf as an afterthought some time ago.

I set up folding tables along the facility's only concrete wall, found a generator nearby and grabbed a few spare consoles from the Wheatstone plant a few miles inland. These temporary arrangements would keep WMGV(FM) 103.3 MHz, WIKS(FM) 101.9 MHz, WSFL(FM) 106.5 MHz and WXNR(FM) 99.5 MHz The New Hot 99.5 afloat. I then began to plan new studios.

I quickly realized that we didn't have the manpower to replicate the studios even if we wanted to. The wiring for our analog studios alone would have taken weeks. Getting contractors in and scheduled to do the work when others were also dealing with their own cleanup and renovation after Hurricane Florence was another problem.

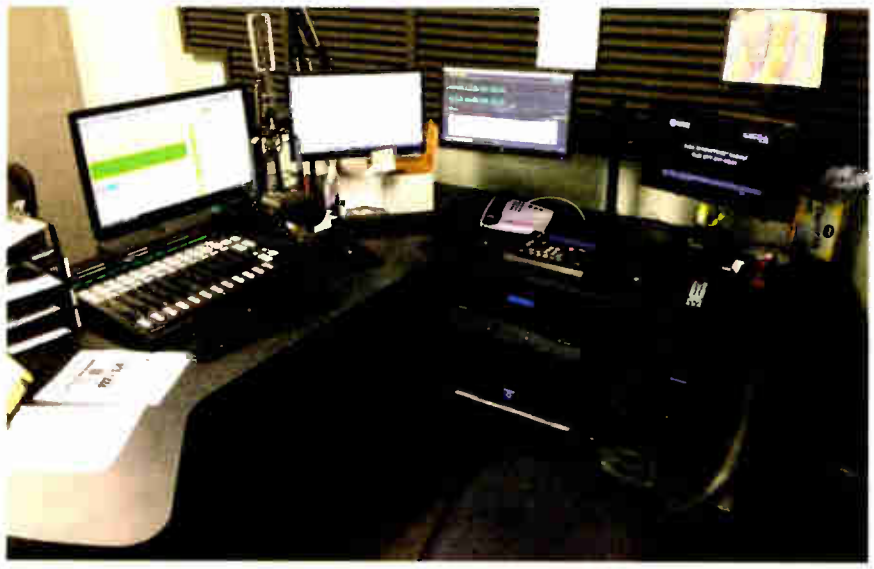
All of this convinced us to go with ready-made Quickline furniture for the three production rooms and four on-air studios. Quickline is made by Wheatstone and is extremely modular. There are essentially five modular components that can be configured 32 different ways. Plus, because it's built by a broadcast equipment manufacturer, it has things like removable rear access doors and adequate rack space.

We dropped into the furniture Wheatstone's IP-12 control surface with mixing engine, M4IP-USB mic processor Blades and a VoxPro audio recorder/editor for seven studios, all identical. I had to rewire the entire building, but when it came to the studios, all I had to do was run shielded Cat-5 and a patch panel.

Within no time, the studios had new furniture, new boards and new routing, and they were fully functional.

I don't expect to have to repeat the process anytime soon. But we do keep an eye on the weather around here.

For information, contact Jay Tyler at Wheatstone in North Carolina at 1-252-639-7000 or visit www.wheatstone.com.



One of the new studios with Quickline furniture.

Another rebuilt studio with Quickline.

WSFL studio gutted.

ABOUT BUYER'S GUIDE

Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, is a freelance article by a paid reviewer who typically receives a demo loaner. Do you have a story to tell?
Write to **brett.moss@futurenet.com**.

TECHUPDATES

OMNIRAX WORKS AT HOME TOO

Omnirax says that as businesses around the globe start to reopen, they face the dual challenges of adhering to new social distancing guidelines and protocols in facilities and offices, while also arranging for many employees to remain working from home.

The company says it can help achieve this balance in several ways. It can review and modify the space plan of a facility (studios and offices) to maximize efficiencies, while adhering to new guidelines and protocols. It can also collaborate on creative space plans for new facilities to find opportunity in the challenges of the "new normal."

Omnirax says business leaders increasingly are accepting that there is significant ROI to be found by investing in ergonomic, purpose-built furniture for working from home. It says this helps workers become healthier, happier and more productive, with a relatively modest one-time company investment.

Financially, this can reduce workers' comp claims, lost time and rent, with less square footage necessary at the time of renewal. Strategically, it can help you retain employees when you can offer the perk of a cool home office and the ability to work from anywhere.

For information, contact Omnirax Furniture Co. at 1-800-332-3393 or visit www.omnirax.com.

Examples of Omnirax "work from home" concepts.

TECHUPDATES

STUDIO TECHNOLOGY: "CUSTOM, NOT COOKIE CUTTER"

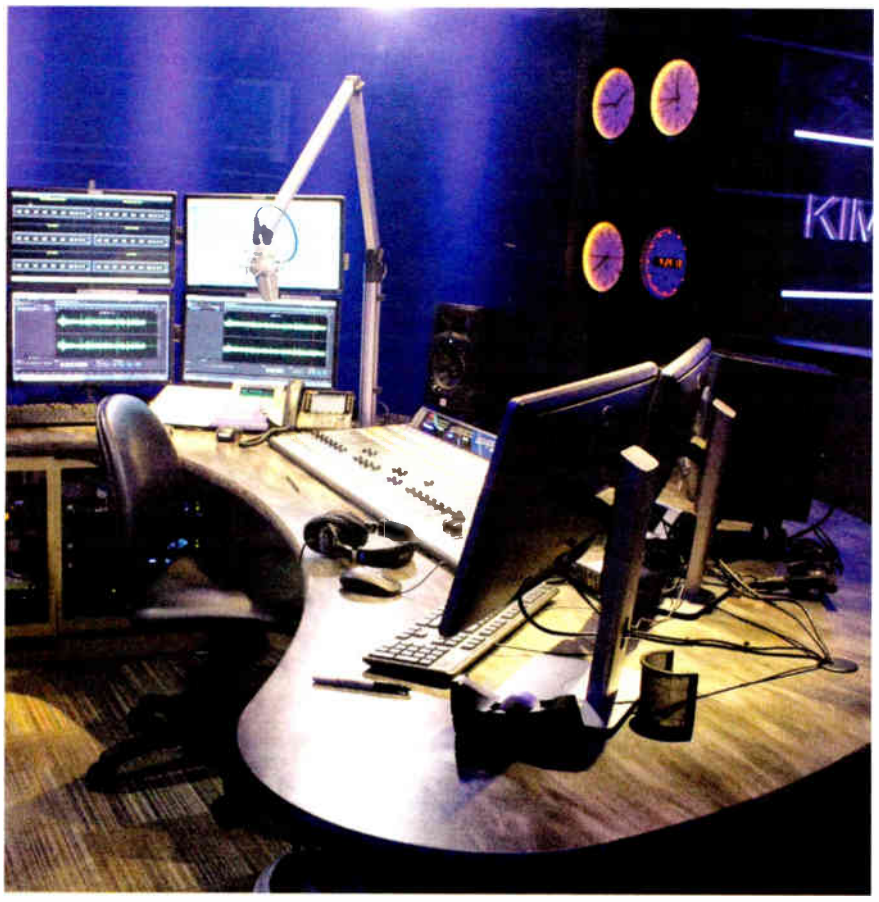
Studio Technology designs, constructs, delivers and installs technical furniture for radio and television. The company says it will provide true custom furniture that is price-competitive with modular furniture, not "a cookie-cutter solution that is customized."

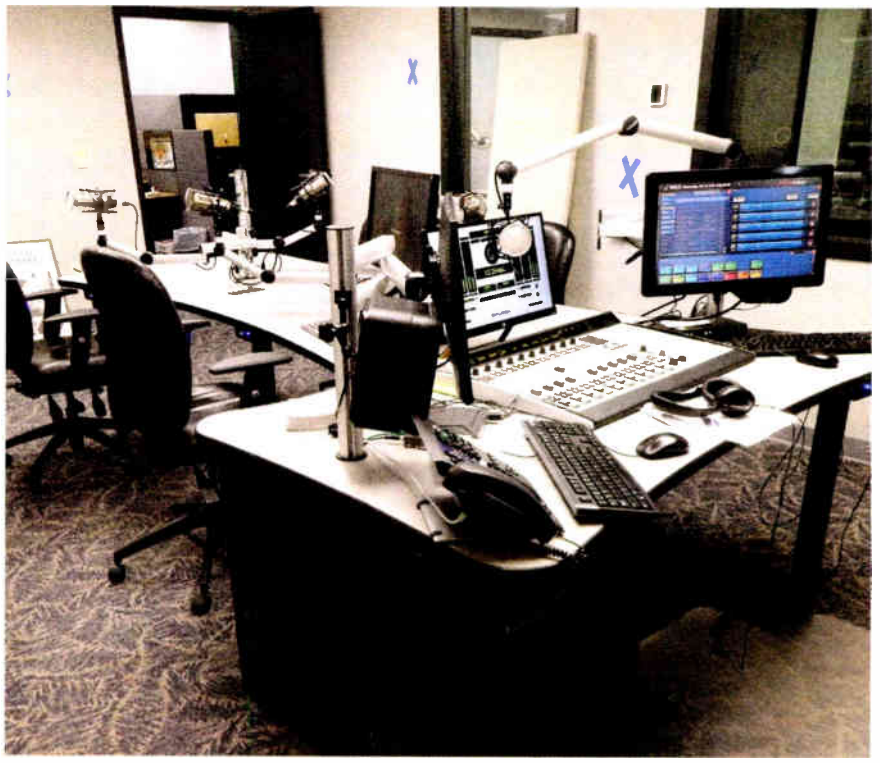
It can also provide and warranty higher-end furniture using solid-surface materials because they are certified fabricators.

Studio Technology furniture can be found in broadcast facilities large and small around the United States. It says its goal is to develop a design that fits a station's budget and operational needs.

"We will work with your architect, systems intewgrator, and local staff and offer complete delivery and installation using our own employees," says President Vince Fiola.

For information, contact Studio Technology in Pennsylvania at 1-610-925-2795 or visit www.studiotechnology.com.





TECHUPDATES

GRAHAM STUDIOS HIGHLIGHTS EXPERIENCE AND SERVICE

Graham Studios notes its long history of creating quality custom broadcast furniture for radio and TV stations. To this they have added offerings for the world of podcast and home studios.

The company says it will design studios to fit a space, unique functional requirements, or the personal style and budget of a station or individual.

It offers three furniture lines.

Modulux is a premium classic radio design with oak trimmed table edges and frames. The design uses an innovative structural corner post for easy assembly.

Radius is a modern economy line that the company highlights for its air flow and robust constructability as well as an ergonomic and sleek look.

Birch Line is composed of a tough core shaped to a clean edge. It utilizes advantages of the other product lines while staying in a tight budget.

To make sure the furniture arrives undamaged, the company constructs shipping crates secured with foam. Studios are flat packed, palletized or delivered in modules.

Furniture includes detailed manuals with personal diagrams. Assembly requires basic hand tools.

For information, contact Graham Studios in Colorado at 1-970-225-1956 or visit www.graham-studios.com.

TECHUPDATE

SHURE AD3 PLUG-ON HANDLES MULTIPLE DUTIES

Shure offers the AD3 plug-on wireless transmitter. It says it is suitable for gathering and reporting news, capturing audio for film and television, or sideline interviews.

This is the latest addition to the Axient Digital Wireless Microphone System. The AD3 turns XLR microphones into digital wireless microphones. Shure says its wide tuning, encryption features and spectral efficiency make it suitable for various types of broadcast reporting.

Out of the box, the AD3 includes a patent-pending locking mechanism with an XLR connector design, a user-friendly control menu, OLED display that is easy to read in poor lighting conditions, and construction that is resistant to sweat, moisture and debris. The transmitter includes a pouch, belt clip and USB-C cable, and supports conventional AA and Shure SB900A rechargeable battery options.

Shure says, "The plug-on transmitter enables field reporters, audio professionals, and on-set sound engineers' access to a rock-solid portable audio solution that perfectly complements the power of Axient Digital."

For information, visit www.shure.com.

ANTENNAS/ TOWERS/CABLES

WANT TO SELL

CCA FM8000G Trans 107.9, great cond; 4-Bay Jampro antenna w/deicers; 3-bay Shively antenna FM. D Brockman, 606-965-3436.

AUDIO PROCESSING (INCLUDES ON-AIR)

WANT TO BUY

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST - 214 738-7873 or sixtiesradio@yahoo.com.

Wanted: real plate reverb. abgrun@gmail.com.

MISCELLANEOUS

WANT TO SELL

UPGRADE consoles to international specs with world standard Weston 30B illuminated 4" vu meters. 4 in like-new condition. GramOphone@earthlink.net

I'm selling between 150 and 200 cassette tapes that consist of old-time radio shows, sports shows, some local New York radio talk shows, etc... Must take entire collection and the price is negotiable. Please call me for details and, my phone number is 925-284-5428.

Radio broadcasts of Major League Baseball, NFL, and some college football games that are on cassette tapes, approx 100 to 125 games, time period of entire collection os from the 1950's – 1970's, BO. Must purchase entire collection. Contact Ron, 925-284-5428 or ronwtamm@yahoo.com

WYBG 1050, Messina, NY, now off the air is selling: 250' tower w/building on 4 acres; 12' satellite dish on concrete base; prices drastically slashed or make offer. 315-287-1753 or 315-528-6040

MICROPHONES/ HEADPHONES/ SPEAKERS/AMPS

WANT TO SELL

1934 RCA 77A double ribbon microphone, originally used by Arthur Godfrey at WFBR Baltimore. 100% perfect condition. Contact Bill Cook, 719-684-6010.

WANT TO BUY

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 214 738-7873 or sixtiesradio@yahoo.com.

RECEIVERS/ TRANSCEIVERS

WANT TO BUY

AM Stereo radio. Call 417-881-1846.

RECORDING & PLAYBACK HARDWARE

WANT TO BUY

1960s-vintage MacKenzie Repeater machines, magazines, spare parts and manuals, complete or "parts" machines considered, James, 870-777-4653.

Schnader telescriptions 16 mm musical films produced in the early 50s. Bill Cook, 719-684-6010.

Large or small collections of 16" transcriptions or 12" transcriptions, not commercial LPs. Bill Cook, 719-684-6010.

Standard Short-tune series. Bill Cook, 719-684-6010.

(2) LPFM radio stations for sale, located in the NW part of central Florida on the gulf coast, covers the county, get out of the cold weather, come to Florida, call or write for particulars, 352-613-2289 or email boceey@hotmail.com or Bob, PO Box 1121, Crystal River, FL 34423.

RF CONNECTORS

WANT TO SELL

RF CONNECTORS & GADGETS – Parts, Products & More! www.W5SWL.com

TAX DEDUCTIBLE EQUIPMENT

Donate your broadcast facility; IRS approved 501(c)(3) nonprofit charitable organization. Fair market value. License (AM/FM/FV), land, building, tower, equipment, etc. The Augustus Foundation, Inc., 2902 Main Street, La Marque, Texas 77568. (409) 359-3435. Contact Dr. M. Augustus

TRANSMITTERS/ EXCITERS/ TRANSLATORS

WANT TO SELL

BE-25T 25KW FM transmitter 2007 frequency agile tube transmitter in good working condition on 90.7 (all its life) when pulled from service. Approx. 6 mos. on rebuilt tube and a newly rebuilt fan motor, also spare optical modules, manuals and maintenance logbook. $17,500/OBO. As-is, where-is: Hayward, CA, Jeff Cotton, 530-279-6262 or info@kdup.org.

TUBES

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READER'SFORUM

WWV IS NICE BUT NOT ALL THAT CRITICAL

(This letter and the one after it appeared on the Radio World website a few days apart.)

While I agree with most of the points raised by the author of the article "Why WWV and WWVH Still Matter" (RW, June 24), as an engineer I've long abandoned zero beating WWV to calibrate local frequency references.

In fact I owned a WWVB comparator, basically a loop antenna and TRS receiver tuned to 60 kHz that permitted fairly precise calibration but took many minutes to center the reading due to the typical path instability of radio waves, even using the ground wave, which is only useful in daylight hours.

Time code generators at WWV.

At night WWVB is unusable for frequency/phase measurements due to skywave propagation but is the best time for those so-called atomic clocks to calibrate to the slow time code repeated once a minute on a daily basis.

So, how do I calibrate the frequency references of my frequency counters and spectrum analyzer used for broadcast engineering? The answer is GPS.

The line-of-sight microwave band signals provide much less jitter, especially when more than one SV is used for a timing solution. You can buy GPS timing receivers on eBay and elsewhere for under $100. Add a cheap patch antenna or a quality outdoor antenna and you're good to go.

You'll get both data for time of day and a precision 10 MHz reference signal you can lock to a synthesized RF signal generator to dial in any frequency precisely. And just in case a GPS signal is for some reason not available I have an old Rubidium Atomic Oscillator on hand, also quite inexpensive second or third hand.

So, ultimately as nice as WWV is to have around, except for WWVB there really isn't a great need for HF time signals anymore.

Ira Wilner
Chief Engineer
Monadnock Broadcasting Group
Keene, N.H.

DON'T DUMP ON WWV

Ira Wilner's letter above raised an eyebrow with me. The notion of eliminating the HF (2.5 to 20 MHz) service of the NIST National Institute of Standards and Technology station WWV is a bad idea.

I regularly use the 5 and 10 MHz signals to calibrate time bases in my spectrum analyzer, signal generators, receivers and frequency counters. It is a time-proven technique to zero-beat their reference oscillators with WWV and still valuable today in commercial and amateur radio use.

Yes, the Global Positioning System does that job, but it is vulnerable to enemy attack. WWV is the fallback to save us from problems of synchronizing networks, including the internet in the event that GPS becomes unusable.

The 60 kHz WWVB is the source for automatically setting "atomic" watches, wall clocks and other devices. Since we agree on that, then keeping the HF transmitters of WWV working is a small price to pay in the overall scheme of things. They are all at the same site in Fort Collins, Colo., operating from the same frequency standard and maintained by the same crew.

GPS is not infallible and is subject to interference, tampering or having satellites knocked out of the sky by those who do not like us. We'll be glad we still have WWV when things get rough.

Mark Persons
Brainerd, Minn.

The author is a Radio World contributor and retired consulting engineer.

LUBRICATING CONTACTORS

I saw Mark Persons' two articles this year on "Best Practices for AM Directional Systems."

I too have used silicone to lubricate contactors, but I found over the years that often it collected dirt and dust in the contacts and sometimes just didn't seem to really fix the issue with sluggish contactors.

I was able to fix a particularly troublesome contactor by switching to a dry lubricant using graphite because it wouldn't get "gummy" over time.

Silicone, yay or nay?

WD40, CRC and Blaster offer aerosol delivery of graphite dry lube. It delivers via liquid and then evaporates, leaving the dry lubricant behind.

Brett Gilbert
Griffin Communications
Oklahoma City, Okla.

ANOTHER BRICK WALL

Please let me add my 2 cents' worth regarding music tracks that have been clipped and trashed with "brick-wall" audio processing (May 27, Opinion section).

The next time your radio station receives a CD or file that has been brick-wall limited, simply return it to the sender with an impersonal form letter saying "The music you have supplied is defective and/or unsuitable for broadcast. We do not air any material that is detrimental to our listenership," or words to that effect.

If a few hundred radio stations return a few thousand, refusing to air them, perhaps the music producers and record labels will fix the problem.

We can only hope!

Hank Landsberg
Henry Engineering
Seal Beach, Calif.

AM MIGRATION IS STILL A GOOD IDEA

Responding to the story "Urban One Disappointed by FCC Action on AM Multicasts":

Someone please put Ajit on the shoot and ask him why the commission won't support expanding the FM band in the lower end!

It's the simplest way to revitalize the AM stations in a way that is most easily supported by radio and transmitter manufacturers and applying similar rules to those governing the existing FM band.

This band could be designated all-digital and allow the AMs time to build their facilities ahead of and during the manufacturing of radios, while working toward a migration of existing FM stations to an all-digital mode as well, with the possibility of fixing some allocation variances, like grandfathered overlaps that become meaningless in some cases once the stations are all digital.

I've been saying this for two-plus decades now. Had we started one decades ago, we'd be settled in pretty good by now!

I've also spoken about the possible use of the existing AM band being given (allocated) to local municipalities for their public notifications, information and other messaging.

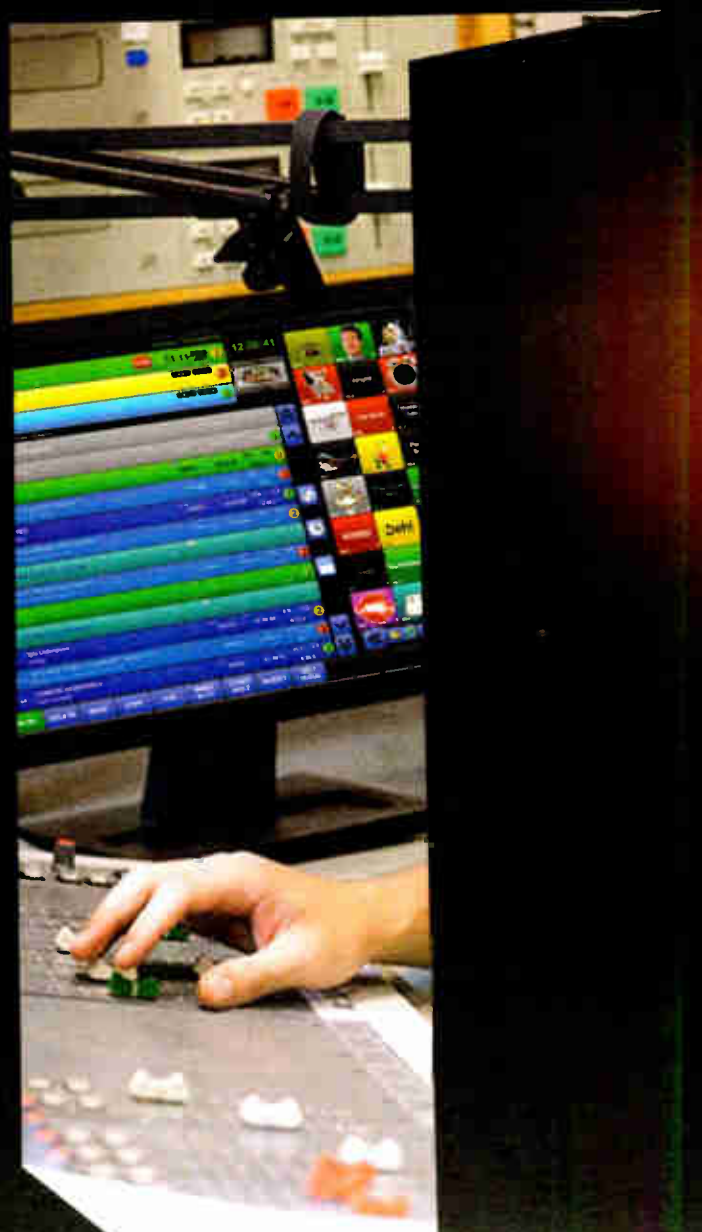
Nothing serves the public better than the city council and other divisions having a direct connection to their citizens. We used to have this on our cable TV providers; those have pretty much all dried up. But being able to access this from anywhere (car, home, portable) is a better solution than cable ever provided.

Traveler's Information Stations are well programmed in some cities, but not many exist. A 250 watt TIS could serve two or three suburbs, or an entire community of small towns, especially when they aren't all piled on top of each other's frequency.

In light of recent and past events, maybe a local municipality's TIS could be a platform for protests, rather than unsafe disruptions of traffic in the streets! That doesn't work now because you can barely hear them, basically making them a waste of energy as just noise generators. At a minimum, they would sure be public service if they provided the city officials' updated information regarding those and other events.

Scott Clifton
Chicago

Open the door to *your* possibilities!



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