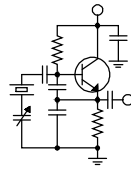


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

JULY 2026 • VOLUME 36 • ISSUE 7 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR

Rolling Our Own

In radio's early days, a lot of the equipment was purpose built by the station's engineers. The days of multiple manufacturers offering an array of competing products had not yet come.

To some degree, that kind of thing continued well into my own radio career. I remember building devices in the 1970s and even the 1980s to meet certain needs. It was sort of fun, designing and building things like that. Sometimes I used point-to-point wiring, but other times I would print my own circuit boards.

It wasn't all that long ago that we cooked up a simple fiber-optic transmitter and receiver to couple tower light alarms from the AM tower-mounted control box and equipment installed at ground potential. I still have some of those circuit boards around along with the components to stuff them with.

Fast forward to 2026. We have in use throughout the company Enberg BA-6 annunciator panels in our control rooms to alert operators of such things as silence, ringing phones and hotlines, and someone at the door. Those Enberg panels have been around since the 1980s, and while it's hard to beat their simplicity, they very much look like 1980s technology, with night light bulbs as the primary indicators. They are certainly out of place in our state-of-the-art AOIP control rooms.

No doubt you read in these pages in prior months about a project that I had Stephen Poole on, a modern-day replacement for the old Enberg panels. Where we left off, we had our test unit running on the

bench in Denver and Stephen was continuing to tweak the code to polish the display as well as the configuration web pages.

Since then, we have built and deployed two working (i.e. "production") units in our Denver studios, the first in the KLZ control room and the

second in KLTT. We are just about ready with a third unit, and we'll finish up with a fourth.

These devices employ a Raspberry Pi-4 as the "brains" of the operation, and a 27-inch LCD monitor with HDMI input for the display. The photo to the left shows the one in the KLZ control room with silence on KLZ (it wasn't really silent – we just pulled the antenna lead off the receiver to test



it).

We initially set things up in our "production" units with four inputs from Wheatstone LIOs (logic outputs). Those LIOs are cross-connected in software with silence detection from off-air monitor receivers, and if one goes silent for more than a few seconds, a graphic is displayed on the screen indicating "KLZ Silent" (or whichever station has no signal or audio). All four stations are monitored, and silence on any of those stations will be reported on the displays in all the studios.

Three of our stations in Denver employ Telos HX6 on-air phone systems connected to incoming lines set up to feed analog ports in our Avaya IP Office 8 phone system. Ringing talk lines or hotlines are detected by analog ring detectors, the closures from which are connected to the Pi annunciator display systems. One station, however,

KLZ, employs a Telos VXs virtual on-air phone system, and with that system, there is no “ring voltage” for us to detect.

The VXs does, however, allow configuration of GPOs (general-purpose outputs) through the Livewire network. That’s great if you’re an Axia facility, but what if you’re a Wheatnet facility? There’s no way to make a Livewire GPO from the virtual phone system “talk” to the Wheatnet infrastructure. Or is there?

I ordered on eBay a used Axia GPIO (general-purpose input/output) node some time back and had sent it to Detroit for another project, but that project was sidelined, so I had Mike send the node to Denver. Amanda and I set it up on the bench, and she somehow figured out how to determine the IP address of the unit.

Once we had that, we were able to set a new IP address to one on the Wheatstone AOIP network and plug it in there. Then I went into the configuration of the VXs and set up a couple of GPOs, one for the three lines in the hunt group and one for the hotline, mapping them to two different closures on the Axia GPIO node. We ran a quick test, and it worked!

From there, it was a simple matter of making a physical connection between those Axia node closures and logic port inputs on a Wheatstone blade, creating LIO sources for them in Navigator, creating LIO destinations on the KLZ control room blade, and cross connecting them. We had to add two more wires to the GPI (general-purpose input) cable for the display Pi, and that was it!

When any of the lines in the KLZ on-air hunt group ring, an “Incoming Call” graphic pops up on the display. When the hotline rings, a flaming “Hotline” graphic appears. Simple, but effective in an environment where you can’t have an audible ring!

So here we are in 2026, still “rolling our own,” manufacturing bespoke devices that you can’t buy (or that cost more than we’re willing to spend). Over the past couple of years, we’ve manufactured and installed SNMP-enabled antenna switch controllers and an SNMP-enabled HVAC controller using Pi-4s.

For some time now, we’ve had a Pi-based SNMP interface in development for our older (mostly) auxiliary transmitters that don’t have web connectivity. Stephen has the code written and we have bench-tested it. I need to deploy one of these

devices on a Nautel ND-series transmitter and see how well it works. That would certainly give us more options for controlling those older transmitters.

And now that I’m thinking about SNMP, I’m wondering how hard it would be to add SNMP

functionality to the studio annunciator board display Pi’s. Just think of all the stuff we could monitor and cause to light up on that display! Hmmm...



EAS Security

By now, all of you are no doubt aware of the FCC’s recent action requiring certain security measures for EAS equipment. This comes after a number of instances of EAS system hacks, most if not all that were the likely result of the default password remaining unchanged on the units.

Most of the required changes are common sense, steps we have already taken:

- Passwords will have to have a minimum of 15 characters, not use dictionary words and not be reused elsewhere.
- Put the EAS equipment behind a network firewall or use comparable network segmentation practices to limit remote management access to authorized devices and authorized users, which will secure EAS and other vulnerable equipment on a private network inaccessible to the public internet.
- Block inbound public internet connectivity to EAS devices, or otherwise isolate EAS equipment from general-purpose business networks so that unauthorized external access is not possible.

Interestingly, the FCC is placing the same requirements on unprotected STL equipment. We have just one such public internet based STL in the company, and we’ll be using a VPN to safeguard it from hacker hijack.

As far as I can tell, we’re otherwise already in compliance with the new FCC requirements, which will go into effect in a couple of months.

The New York Minutes
By
Bill Stachowiak
Chief Engineer, CBC – Western New York

Greetings from Buffalo!

We received an alert from the WLGZ transmitter last month informing us that the power was extremely low. Upon investigation, we determined that the Continental IPA module had failed.

Since we did not have a replacement on hand, I had to come with a quick solution to get us back to a reasonable power level.

I decided to use a Broadcast Electronics FXI250 exciter as a temporary replacement. With 250 watts drive, I was able to get 100% output.

I borrowed a spare module from my son, Philip, who is the chief engineer for Town Square Media here in Buffalo. We will be installing it soon.

As it turns out, we will soon be replacing the aging Continental 816 with a new Nautel NV10^{LT}.

At the WDCX-FM site, the air conditioning stopped working (again!), but this time, we were alerted via our remote temperature monitor that we recently installed.



We checked out the HVAC system as thoroughly as possible and changed the filters. We haven't had a problem since.

From the memory archives...

One day, I came to work expecting just a normal day of work. I went up to the transmitter room located on the 27th floor of the Rand Building in downtown Buffalo to find that the dehydrator that serviced the main 6-inch-line that connected the output of the combiner to the 5-bay ERI antenna at the top of the tower was constantly running. WTSS and WBLK share an antenna because of lack of space on the main pole that all the TSM antennas are on.

To make a long story short, we found that an elbow located right below the antenna had broken. The problem was that when the system was designed, the ability of the line to flex was not considered. I decided to put a section of 6-inch air dielectric line about halfway up the tower. This provided a way for the line to flex when the wind blew the top of the pole around. We never had a problem after that modification was made.

The Motown Update
by
Mike Kernan, CPBE
Chief Engineer, CBC–Detroit

Batteries Not Included

It seems like every month I'm replacing UPS batteries. I can only surmise that every unit was bought or had its batteries changed at roughly the same time.

In any case, I've discovered that buying batteries from Home Depot is working out marvelously. Not only do they have every shape or size I've needed, but they also deliver them for free, and batteries are heavy, so having them sent FedEx or UPS is costly. The latest UPS that I discovered was displeased with its batteries takes 10 of them!



the lift pump – roughly \$500 for the pump and \$1,000 for labor. I sourced a genuine Cummins pump from eBay for less than \$60 and replaced it myself.

I tell this story because we all rely on generator service contractors, and we need to watch them closely. For some reason our HVAC contractor can show up here for a hundred bucks, but the generator dealers think they should get nearly a thousand every time they roll out a tech in a truck. I stopped using one after they charged over \$300 for “shop supplies.” What’s that for anyway, a few rags and a squirt of WD40? (Hint: it’s called “padding the invoice.”) My theory is that they are used to fleecing hospitals and other large companies whose AP departments get their invoices and routinely rubber stamp them.

Zero Fuel, Zero Kilowatts

During our recent PM visit from our generator service contractor, the technician discovered that he was unable to prime the fuel system after changing out the two large fuel filters. Proof that training is no substitute for experience, our young tier-three tech was stumped. “Sir, your generator won’t start until a new lift pump,” (which has the manual primer mechanism) “is replaced. I’ll get you a quote.”

I explained that needed to get this done immediately because without the generator, we’d be vulnerable. Can we find another way to prime the system? He didn’t know. How about pressurizing the fuel tank? Engage the starter to run the lift pump (it’s mechanical)? Prefill the fuel filters? I even asked him if he had any starting fluid thinking we’d get the big diesel to pop off a few times on that, thereby running the lift pump. None of that made any sense to him – he didn’t even know what starting fluid was. “Just order the part and we’ll install it when it arrives.”

I followed him as he backed up his van the entire length of our half mile long rustic lane, nearly dropping himself off the side several times, to run up to Oh, Oh, Oh, O’Reilly Auto Parts. I returned with a can of Lucas Sure Start and gave the 5.9 liter turbocharged Cummins a few snorts with the starter motor running. That was enough to pump the fuel up from the tank, fill the new filters and pressurize the Bosch injection pump. At least now the generator would start if it was called on – and it was!

A week or so later and after I called to request it, they provided a \$1,500 quote for replacing

Rain AND Satisfaction Fade

Having been on the sending and receiving side of satellite communications my entire career, I’m very familiar with the benefits and shortcomings of this technology.

While working for Greater Media in the ‘90’s, I was stationed next door to their C-Band and Ku-Band satellite earth station. This was a venture Greater Media called “Starlink,” and it was also where we had the radio stations’ C-Band downlinks.

I got to be very good friends with the employees there, and they taught me about their work. Their massive uplink dishes were 13-meter motorized parabolic monstrosities and were used to uplink everything from local sports to national newsworthy reports and even the distribution of commercial production from ad agencies.

Detroit being the epicenter of the auto industry assured that they’d have ads aplenty to uplink, and having the best sports teams this side of the Toledo Mud Hens meant we’d have lots of sports, too.

I eventually had partial responsibility for dismantling this installation when fiber-optic networks pushed out satellite as the default mode for transportation of such content.

Being somewhat of a satellite fan-boy, I had DirecTV at home, of course XM Radio, and took in several syndicated programs, some with full automation.

When satellite internet became available, I started using it for a secondary STL path. I found Viasat to work reasonably well, and it had no issues with sustained always-connected data streams that we required for backup audio. On the negative side, their tiny dishes sending and receiving from satellites in geostationary orbit have issues with weather. Hey, you try hearing something 22,236 miles away in a thunderstorm!

I will stop short of deriding Viasat; however, our love affair is over. The homewrecker, in this case, is rather plain but has a great personality – you know her as 4G LTE. 4G LTE has been round-the-block and is solid as a Clydesdale.

For many purposes, 4G LTE is way more than enough, and so where I was experiencing multiple faults per week on Viasat (even in good weather), I decided to give it a try. I use 4G LTE data connectivity in my truck for its connected services and it's perfectly fast enough for everything. Whether it's streaming audio or for the truck's built-in Wi-Fi. I've even noticed 4G LTE handling video on my non-5G iPad with ease.

Verizon has a 4G LTE business internet product that is perfect for our backup STL network. Made by Connected Solutions Group (CSG) and powered by the nearly ubiquitous Verizon network, this little router is seriously perfect for this task. Verizon even lets you purchase unlimited data with a static IP address (static IP is a feature that Viasat never got working for us). This device is about the size of a pack of candy cigarettes (I don't smoke), has a pair of antennae, a handful of indicators and two wired Ethernet jacks. It has onboard Wi-Fi, too, but that's not too useful for connecting STL equipment in the transmitter room.

After deploying the 4G LTE router at WCHB, I immediately noticed a huge drop in latency (from 599ms to 39ms). With the dual-WAN router setup for load balancing, there's always some data flowing on the Verizon network, and so far, uptime

has been a solid 100%. Uptime on ViaSat had been hovering around 98%, and I'd get notifications of faults almost daily – if it rained, several times daily. It's been less than a week at this writing, but so far, so good. Zero disconnects. I'll update you next month.

Miscellaneous Ramblings and Goings On

I'm sick to death of authentication. I thought I was the worst at remembering passwords, but there are people 'round here that make me look like I have the memory of an elephant! Even with a password manager, I still lock myself out!

I know we have to secure everything these days, but it's infuriating when you think you've been careful and you still get burned.

If you want a real eye-opener, check your Burk event logs and count the number of "TCP Connection closed xxx.xxx.xxx.xxx UNKNOWN USER".

Because of this and a recent dispatch from the FCC, I've headed down the security pathway again. This time, EAS isn't secure enough, even though it's behind a firewall and no ports are forwarded. Be that as it is, I have now installed passwords that according to Password Monster will take 800,000,000,000,000 years to crack. They're not getting in here!

This may be old to you, but somehow, I missed it. This dandy little bit of freeware known as WinDirStat has brightened my computing life. As someone who seems perpetually dogged by full hard drives, I often find myself in a sort of 'escape room' trying to find a clue to find what's using up all my space. WinDirStat does what File Explorer is afraid to do and exposes physical and logical sizes of folders and files. With it I discovered one file using 10% of my hard drive space called USMT.MIG. Apparently, it's something left over from a migration tool I used when I first got the computer. Click, click – deleted! The URL is <https://windirstat.net/>

News from the South
by
Todd Dixon, CBRE
Chief Engineer, CBC–Alabama

Weird Weather Pattern

I try not to talk about the weather much in these pages. Every one of us deals with it in some form or fashion. I don't have to deal with what mountains do to the weather, lake effect, or snow. What we do have to deal with in Alabama is rapid temperature swings, a 10.79 month growing season, rain that comes from the Gulf of <enter country here>, and long lines at the grocery store for bread and milk every couple of winters because a meteorologist mentioned the word "white ice flakes." I can't really bring myself to put the word out there for the calamity that it causes southerners to go through.

The current pattern we're in is called SUMMER IN ALABAMA. We had about 25 days straight where rain was forecast somewhere in the area, and the rest of the area just deals with the humidity in the air that can only be classified as Amazon jungle damp.

Dave Richardson, who programs WXJC for us, planted a garden this year that included 12 tomato plants. He has currently reaped a harvest of more than 250 tomatoes! I haven't heard him complain about the weather, but he apparently is going to can them and have a stockpile the likes of what biblical Joseph told the Egyptians to prepare!

For the invasive stuff you don't want, it all just becomes strategic planning for when you can go try and kill stuff and keep it beat down.

I'm highly allergic to urushiol, the sticky oil from the poison ivy plant. Pair that with the south, the heat and my over-active sweat glands, and it is a recipe for a skin rash that makes your nervous system feel like it is literally going to short out when you take a shower and has you praying to God to end it all.

I took two sick days this past month due to that very thing, and decided then and there, that at the ripe age of 56, I was going to begin to handle this better and be better prepared so that the altars in my life didn't revolve around the times I have had severe poison ivy outbreaks.

For that, I have found a spray similar to Round Up called RM43. I ordered it from Lowe's at

\$90 per gallon, and each quart will prepare about 15 gallons of the right concentration that will assault your weeds. The initial spraying has already begun to kill everything it touched. It's the closest I've ever been to a scorched earth mind set, but I'm there and I'm going to kill it all.



Wireguard and What's Next

Wireguard has served us well and will continue to do so for a long time, but over the course of the last year or so, I've become convinced that we could use other technologies that are built on the shoulders of Wireguard that would suit us better and allow us to handle our networks better.

There are a couple options out there, and they all have more of a graphical user interface that would allow us to create what is known as a SDN-software defined network.

If you've ever hooked up any Ubiquity (or TP Link) access points and used their "controller" software interface to create a number of guest networks and even set up their Access control lists (ACL) in a GUI that essentially instructs the data where to go, this is the direction that I am talking about.

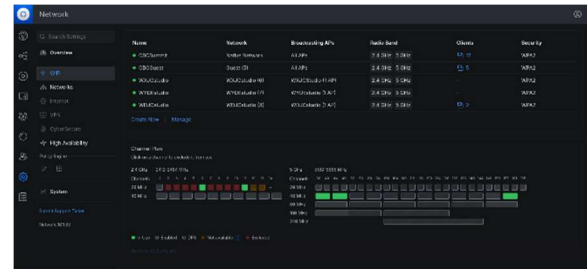


Figure 1 - Birmingham's Linux based Unifi controller PC interface that shapes our wireless access point hardware and provides user access.

In our current Wireguard configurations, once a user is given their key pair and has activated his VPN tunnel, they have access to the entire LAN. While a vast majority of the users are responsible and use the tools we have as directed to get their work done, there is an opportunity for something to happen on the network because they currently have more

unrestricted access than they really need.

What if we could place a software abstraction layer on top of all of that which would allow users to only go to the machines that they are permitted to use? Tailscale is one of them that uses Wireguard as a base (<https://www.tailscale.com>). In their case, they host a relay server, and your device clients ping that relay server to let your network know where everybody's IP address. Effectively, you can manage your remote connectivity on a network that you create with ACL groups.

They have a personal plan that is free, and standard and premium plan (\$8 or \$18 per user, respectively). The personal plan can have six users and unlimited devices.

A friend asked me this past month about remote access to his servers at home and I mentioned that Tailscale would be perfect for him since he was going to be the only user that would need access to the devices. He reported back to me that it literally took him about 10 minutes to set up his account, put a Tailscale client on his phone and then add some clients to some services he runs from home. He had a quick and dirty, very secure remote access to his network in minutes.

Tailscale has an open-source equivalent called Headscale that would allow us to host a service

that does the same thing, with the exception that the relay server would be "in-house" and unlimited in every way. Several other projects like Tail/Headscale are NetBird (<https://www.netbird.io>) and another called Pangolin (<https://www.pangolin.net>). Each provides a software layer where a network can be laid out in the way that you want it to be and allows the power of giving users more granular access to our networks.

The nice thing about all of these is that PfSense can handle all of these projects well, and whatever direction we move toward, all of them can be built up beside our current Wireguard setups so that we don't risk down time while the backend work is being done. When it is rolled out, we should be able to simply provide download links for our users that will already include their secure connection information.

It's not a primary concern right now, but I can see where the centralized usage could be a real benefit to everybody, but especially the engineers in all of our markets to keep tighter control on their remote access abilities.

Next month we'll talk about a possible replacement for RealVNC called RustDesk, but in the meantime, may God bless the work of your hands and have a fantastic 250th Independence Day!

Tales From Cousin IT

by

**Stephen Poole, CBRE, AMD
CBC Corporate IT Specialist**

Our in-house development focus has shifted from Alert Displays back to SNMP for older equipment. I resurrected some old code that I had been working on, fixed some bugs and started piecing it all together. More in later installments of *The Local Oscillator*, Lord willing.

Picking back up from last time, I've been enjoying my new Kia Sportage, but some changes have occurred to the "smart" display on their own. For example, when I first started driving it, I could listen to FM while the GPS map was displayed. Now, if I do FM, I get no maps. If I do digital media, I can have the map, but the display insists that I should listen to news from Reuters and NPR. Gack.

Sirius/XM is just as boring as ever. I tried it again and still don't plan to subscribe. They've changed some channels and a few other things, but

they're still playing many of the same songs and comedy skits that I used to listen to in the F150 before Sandy passed away ... four years ago now as of July 1st. (I still miss her.) For long trips, I personally think that Google Play and Amazon Music are better deals; I suspect that iPhone users would prefer Apple-style products.



Alien Hunting!

Like most states, Alabama is littered with interesting little towns that might be good hiding places. Burnt Corn is on I-65 South of Montgomery, which would be quite a drive. I had to cross that one off the list, even though I'd love to ask where they got the name. Slapout is located just above Montgomery and might end up on my list, but



Figure 1 - The Knightscope K5. Streaks along at 3 MPH.

they no longer call it that: it's Holtville now. The original name came from a local store owner who would say, "We're slap out!" if it wasn't in stock. This obviously happened often enough to become locally famous.

Just north of me in Cullman County are a couple of intriguing possibilities for an alien hunt: the first is Bug Tussle, so named because a someone high atop a local hill watched two men fighting down in the valley. "They looks like bugs tusslin'." I've been through there many times on AL highway 69, headed to WYDE-FM in Pumpkin Center. I've never stopped, though; the only thing of note is the old Bug Tussle Steak House. It burned many years ago and still sits unoccupied. I'd have to (carefully, I don't wish to be eaten!) wander off into the sticks if I was do any serious huntin'.

Finally, there's Slick Lizard in Walker County, so called because the mine shafts were so tight you had to be "slick as a lizard" to get through them. No telling if I'd spot aliens there. I'll post pictures here if I do, but be warned that it may be difficult to tell them from some of the locals. I'll do the best I can.

Robots and AI, Oh My!

I won't bore you with my usual honk about the weather here (alternating heavy storms and flooding, followed by hot and humid with little rain). No point in continuing to rant about all of the treasure, effort and real estate being tossed at the over-hyped "AI revolution." I will mention that Google's AI assist for programming and computer configuration has become worse lately. Their instructions only work about half of the time. I literally copy and paste their stuff and get errors.

But I had fun looking into this one: Knightscope is based in Mountain View, CA and makes security robots with – of course – Artificial Intelligence capabilities. The K5 mobile units remind me of Daleks from the classic Doctor Who series (Figure 1). Google returns page after page of promotional stuff from the company about how these 300-400 pound things are revolutionary and totally worth the thousands of dollars in monthly lease fees. They use a subscription-type plan for their products (including the fixed mount K1, Figure 2).



Figure 2 - I ain't got feets, so I go 0 MPH!

So how are they doing? That's not quite as sunny as their marketing. Several well-reported failures have occurred, including a K5 that scooted along obliviously at its top speed of 3 MPH into a

fountain in Washington, DC. It drowned and destroyed itself. Oops. It has also been reported that they've run into people and have trouble navigating through obstacles. In one case, the K5 knocked over a toddler, then ran over its foot. Oops again.

A few cities in Ohio have declared them not worth the cost and have returned them. New York City evaluated them and decided "Nay, nay." At any rate, Knightscope posted a \$33.8 million loss in 2025. They still present a brave front: they've introduced a new, miniature sports car-like security bot called the "K7," but financial analysts are divided over whether to buy their stock.

Stephen is anything but a financial adviser (thank the Lord), but I can opine. Many startups are totally legit, created by people with a Big Dream™. But the big institutional investors and Money Guys only play that "dream" IPO for short-term profits. They'll buy low, immediately sell after the price skyrockets, then sit and count their money when the Big Dream company crashes and burns.

I'm not saying that Knightscope will fail; I can't offer a useful opinion. For all I know, their K7 will become a huge and profitable hit, even managing not to run over or into anyone. My weird sense of humor did enjoy looking into this. The funniest story was that of a loud, profane drunk who clumsily attacked a robot, which recorded a detailed video of the guy whacking and cussing. The police gladly accepted that as evidence. Win, win ... I guess.

AI-Generated Content

For those who are interested, there are several ways that you can tell if text, video or audio has been generated by an AI. They tend to recycle voices and "actors." I've seen the same people appear in totally unrelated videos and I've heard the same voices in different clips.

The short videos that show cops being humiliated by federal agents use the same basic script: the fed repeatedly warns the police officer not to continue, the cop ignores them, and then you see black vans filled with ninja-looking guys hop out and surround the area. It also amuses me that earlier clips featured AI "actors" who looked very much like real-life celebrities – Vin Diesel, Duane "The Rock" Johnson, and others. This suddenly stopped a few weeks later, which makes me wonder if a bunch of cease and desist letters had been sent. Heh.

One giveaway for videos is that the "actors" are cartoonishly beautiful or handsome. You'll also see the same faces over and over in completely different scenarios. The scripting itself tends to be

overblown and needlessly melodramatic. But the weirdest are the "dumb cop" skits that have the cop, truck driver or federal agent change appearance! In one scene, he's an overweight balding guy; in the next, he might be a completely different-looking guy or girl.

But for me, the absolute biggest giveaway is the scripting itself. The wording is repetitive and stilted, along the lines of "It was a dark and stormy night" and "Little did John know that his life was about to change." Overblown melodrama. I mentioned in a previous article that some radio-oriented companies now offer AI-generated ads, ready to go on air. I'd give them a (very) careful listen before I bought into that. "This charming little bistro is nestled in an adorable cove ..." You should use the same language as your listeners.

Scams And "Vishing"

If you're keeping score, we have phishing (traditional email), smishing (SMS text messages), and quishing (naughty QR codes) scams nowadays. Add another to the list: Vishing, or voice phishing, where a bad guy (or bad AI) calls you, pretending to be your bank or other institution. They'll spoof the caller ID to show a known, trusted phone number. My advice on all of the above is to never, ever give login or personal info to anyone unless (1), YOU initiated the contact and (2), you are certain that you're dealing with the right people.

Our employees – our partners – have actually done very well on this lately. Yes, we've had some co-workers who've been hacked, but for the most part, our people are smart enough to ignore scams. They've done well in that regard. Some are so obvious that you probably delete them automatically. "Your FedEx receipt is attached." (I haven't used them in a quite a while.) "Your McAfee subscription has been renewed." (Haven't used them since DOS transformed into Windows.)

As for QR codes, I don't scan them unless I have no choice and unless I know for certain that it's legit – such as the mobile order check-in at my local Chick-Fil-A. If a suspicious pop-up occurs in my browser, I instantly close it, by force (including a total reboot) if necessary. Common sense rules like this go a long way toward keeping you safe.

Let's keep up the good work. Keep praying for this nation! The company names and trademarks used in this article remain the properties of their owners. Images have a Creative Commons license, courtesy of users Fastily (K5) and Votpuske (K1).

The Chicago Chronicles
by
Rick Sewell, CSRE, CBNT, AMD
Engineering Manager, CBC–Chicago

Summer brings vacation time for many of us. Which also coincides with the roughest time of the year for weather with strong storms that can cause problems for radio equipment and operations.

There are two ways that you can take a vacation as a broadcast engineer. One, do what we call a working vacation where we make ourselves available to help resolve issues, or we can take the other option, number two, try to disconnect altogether and let your staff or contract engineer handle all the emergency situations.

About once a year I try to take a week with the latter situation. I will even take my phone and email out of the equipment alarms to help facilitate that detachment. I think it is healthy to do our best to have time away from being “always on call.”

However, I have had a few times when I have done this where I still have had to take part and advise my staff on what I would do if I was there. I am quite sure my staff dreads these summer vacations.

The history of these vacations hasn't always been quiet. In 2016, we had a major lightning strike on the STL tower at the studios, and this took out a lot of equipment. During that period, we also took another lightning strike at one of our transmitter sites that also damaged several pieces of equipment.

In 2024, I was actually on vacation during my honeymoon, and tornadoes came through the area right after I left the on the trip. This caused power outages across the area, and one site had a generator that was suddenly showing signs of a bad radiator. The other site, our largest radio station in coverage, therefore very important to billing, was also on generator, which runs on propane. It is equipped with a 1,000-gallon tank, but even with the transmitter running at half-power, we cut through about 15% of the tank an hour.

So, while we run at half-power under “normal” generator runs, I got involved in the situation and turned the transmitter down to one-quarter power because it appeared that delivery of a

fresh fill would be greatly delayed due to high demand. Even at that lower power, when the delivery truck finally made the delivery, we were probably an hour or so away from being off air.

Fast forward to June of this year, I was on vacation once again, and once again tornadoes came through the area. Again, our 50 kW site was on generator, and again, we needed a fresh delivery of propane. This time they came out after a few days but forgot that we had a 1,000-gallon tank and only brought half of that.

With the strong storms there were several utility poles down and in locations that were in areas of dense woods and brush.

It was going to take a while for us to get another delivery of propane, and it would appear that the utility restoration would take even longer.

Fortunately, our other site had electrical power, and we have a transmitter/antenna combination that can do multiple frequencies, so we put the station on air from that site. It was good that we did, because even with no transmitter on the air, we lost propane and the generator went down. Ironically, the next propane delivery came an hour after we ran out of generator fuel.

However, we couldn't get the generator started after refueling. We had to get a tech to come out to show us how bleed the air from the line. We didn't feel too bad about not knowing how to do that because he had to make three or four calls himself to figure it out.

And by the time we had the generator up and running, wouldn't you know it, the utility company had the repairs made less than an hour later. This allowed us to feel comfortable enough to return to the main site just 24 hours before the next storms were due with more tornadoes predicted. Thankfully, those storms fizzled out and were just normal thunderstorms.

I am quite sure that my staff has come to dread me scheduling a summer vacation. I understand, but I try to live my life not based on fear.



Rocky Mountain Ramblings
The Denver Report
by
Amanda Hopp, CBRE
Chief Engineer, CBC - Denver

Problematic Transmitter...or So We Thought

Note to self...when a transmitter won't produce power, be sure to look at the whole picture and not just the transmitter.

On the first of June, I got an alarm that KLVZ would not switch to the day mode. I put it back to the night site so that it would be on the air at least and headed to the main site.

Once there, I turned on the transmitter and found that it wouldn't produce power and the two modules had PA alarms, but the lights were coming and going, like they were pulsing. I found the transmitter had no PA volts or B+ voltage. The power supplies were good. Fuses checked good as well. I went through everything I could think of, and was comfortable with and all was good.

The next day, I brought my dad out with me so that if I needed to get into some high voltage places, someone could be there to witness my death. We began looking things over and assessing more things, but we couldn't find the cause.

After a bit, my dad had an epiphany. He traced a ground to the PDM kill terminal on the remote interface in the transmitter, pulled the wire off that terminal, and voila! The transmitter came on!

That was what led us to look at other indications at the site, starting (and ending) with the antenna control panel. Both of us were so fixated on the transmitter we didn't even think of looking elsewhere. We found the "main" transmitter light on the antenna control panel wasn't lit, and the "DA" indicator light for tower 3 was dark. Clearly there was an open conductor or microswitch in the T3 circuit.

Thankfully, we don't really need to change to the ND pattern at this location for emergency operation or maintenance since we have a secondary site (the night site) for the station, so we temporarily bypassed that part of the circuit. That removed the ground from the PDM kill line on the transmitter and allowed it to come on and operate normally.

Looking back, I thought I had looked at indicator lights everywhere to be sure the issue wasn't coming from somewhere else, but I either didn't look or just completely missed it. That was a

lot of time wasted chasing a problem. I am glad we finally found it. I feel dumb that I didn't catch it to begin with, but live and learn.



Document Things Better

Earlier this month, or maybe it was the end of May, the swamp cooler at the KLZ site wasn't cooling all that well. I checked the belt and it was brand new. I didn't see anything that said, "I'm the problem!" We had a tech go out and he found the cause quickly. And once again, I felt dumb.

To get the swamp cooler to work, or to shut it down, there are a few steps you have to follow. First, turn the unit off at the control panel. This will cause the unit to drain. Then you turn the water off by the water heater inside the shop area. Then you mosey on behind the building to the spigot. There is a tee-valve that you use to shut off the water that goes from there up to the swamp cooler on the roof.

I personally have never dealt with this. Keith, his son Seth or even my dad would deal with it. Last year, Daniel took care of shutting the system down so when it came time to get it going again this year, I didn't think much of it. But it taught me one thing, to document and have it posted.

One key step was forgotten when getting the system turned on for the season. The valve in the shop area never got turned back on.

When I had looked things over to troubleshoot, there was water in the swamp cooler, so it pointed me to an issue with the pump. I'm thankful that the issue was simple, yet again, feel dumb about not catching it. I have since typed up a document with step-by-step instructions, laminated it and it has been posted above the controller so that it is where we will remember what to do.

This is a good reminder to document everything. Over the years I have created a troubleshooting guide for our studios. As a problem arises, if I think it's something that a board op can deal with, I will document a step-by-step procedure they can follow. Since moving to the Zetta world, some of the troubleshooting has changed. What I mean by that is that it is non-existent because we

don't have many issues with Zetta, at least on a level that a board op can troubleshoot.

Another good reminder is to go through IP address lists. If you keep usernames and passwords documented, make sure it is all up to date. Not too long ago I went through our list and confirmed every IP address listed worked. I verified the login credentials as well. I know I forgot items on the list, but I don't know about those until I try to use them elsewhere and I get an IP address conflict notice.

Alert Board

I don't know what we're calling it, so I'll just call it an alert board. I may have mentioned last month about Stephen creating a program on a Raspberry Pi to allow us to have alerts show up.

We have some old Enberg units that look like they're from the 70's (really from the early 90's I think). I have long been wanting to replace these with something newer and better looking, but have not been able to find anything.

With all the things we've been doing with the Raspberry Pi's, I decided to bring it up to my dad. He spoke to Stephen and Stephen went to work. At the time of this writing, we have three control rooms done with one more waiting to be done. Then we will probably install one in each production room. The control rooms will alert operators when any of the four stations are silent, telling the room which station is silent. It will alert when the hotline rings and when the phone rings for that particular station. We can easily grow it with other alarms if we want.

One issue we found was that with the Telos VXs system, we didn't have a way to have an alert when the phone in KLZ rings, hotline, or studio line. This meant that in the main control room, they had to have the ringer on. Not a big deal when the mic is turned off, but we do have a couple of programs

where the producer interacts with the host. This meant that if someone called in during the interaction, it could be heard on air. Mike Kernen had an Axia node that my dad had bought on eBay that wasn't being used, so he sent it our way. We were able to easily get it set up and working with the Wheatnet system. Thankfully, nothing has blown up by having these two competitors on the same system! We are now able to have alerts for the phones and when we eventually move the other three stations to the VXs system, we can have those phones alert on the board as well.

Coming Up

I cannot believe July is already here. Daniel has done an excellent job keeping the growth knocked down at the various tower sites. The lack of rain has also helped. We did have a couple of days with some good rain, but for the most part it's been dry. We will finish getting the new Raspberry Pi unit set up for our last remaining studio. I may take some time to clean up the seven Wheatstone consoles as well as the other studio equipment. I need to go through door locks and change the batteries out. I just really want to work to be sure things are in good shape.

We hope that some type of monsoonal flow will hit Colorado. We desperately need the rain. There are several fires near the Utah/Colorado border, one of which took the lives of three firefighters. One fire is near the town of Ouray, CO. This is a town that is in a canyon. It's a beautiful place. The fire is in some crazy terrain so fighting the fire is difficult. We hope that these places get some rain to help put out the fires.

I think that about covers it for this month. I pray you all stay safe and well!

The Local Oscillator
July 2026

KBRT • Costa Mesa - Los Angeles, CA
740 kHz/100.7 MHz, 50 kW-D/0.2 kW-N, DA-1

KNSN • San Diego, CA
1240 kHz/103.3 MHz, 550W-U

KCBC • Manteca - San Francisco, CA
770 kHz/94.7 MHz, 50 kW-D/4.3 kW-N, DA-2

KLZ • Denver, CO
560 kHz/100.7 MHz, 5 kW-U, DA-1

KLDC • Denver, CO
1220 kHz, 1 kW-D/11 W-N, ND

KLTT • Commerce City - Denver, CO
670 kHz/95.1 MHz, 50 kW-D/1.4 kW-N, DA-2

KLVZ • Brighton-Denver, CO
810 kHz/94.3 MHz/95.3 MHz, 2.2 kW-D/430 W-N, DA-2

WDCX • Rochester, NY
990 kHz/107.1 MHz, 5 kW-D/2.5 kW-N, DA-2

WDCX-FM • Buffalo, NY
99.5 MHz, 110 kW/195m AAT

WDCZ • Buffalo, NY
950 kHz/94.1 MHz, 5 kW-U, DA-1

WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT

WCHB • Royal Oak - Detroit, MI
1340 kHz/96.7 MHz, 1 kW-U, DA-D

WRDT • Monroe - Detroit, MI
560 kHz/107.1 MHz, 500 W-D/14 W-N, DA-D

WMUZ-FM • Detroit, MI
103.5 MHz, 50 kW/150m AAT

WMUZ • Taylor - Detroit, MI
1200 kHz, 50 kW-D/15 kW-N, DA-2

WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT

WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT

WYRB • Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT

WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT

WYDE • Birmingham, AL
1260 kHz/95.3 MHz, 5 kW-D/41W-N, ND

WYDE-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

WXJC • Birmingham, AL
850 kHz/96.9 MHz, 50 kW-D/1 kW-N, DA-2

WXJC-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT



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