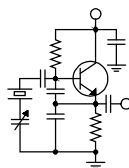


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

JULY 2020 • VOLUME 30 • ISSUE 7 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR

As we sail through the summer months, we also sail through engineering projects around our company. Thankfully, with the easing of many of the pandemic-related restrictions, we are able in most cases to work more or less normally. It's hard to get anything done requiring more than one person while maintaining social distancing.

Chicago Projects

Chicago has the most activity, with Rick Sewell, Brian Bonds and the crew in the middle of an RF plumbing project at the WSRB transmitter site. The new offsite auxiliary facility or WPWX, which doubles as an onsite auxiliary for WSRB, requires upsizing of the transmission line from 1-5/8" to 2-1/4" Heliac on the tower to safely carry the required power for WPWX to the antenna. This transmission line has been on order for *months*. It was slated to ship on June 10 but was delayed for unknown reasons (but I could make a pretty good guess I think) to June 29.

In preparation for that, the inside rigid transmission line runs had to be replumbed in 3-1/8", including a patch panel to give us some options for testing and emergency operation. Rick and the crew are, as I write this, working to get that work done so that when the 2-1/4" line at long last arrives, hopefully in early July, it can immediately be installed.

One interesting component of this project is that there are no gas-pass 3-1/8" EIA connectors available for Commscope 2-1/4" Heliac. They make gas-barrier connectors, but no gas-pass connectors.

The ERI antenna must be pressurized, so we have to find a way to get pressure from the transmission line into the antenna. To that end, I ordered two gas-

barrier connectors, one for each end, and Rick will have to evaluate the construction of the gas barrier to see if it can be converted in the field to gas-pass.

It has been my experience that there is a block of Teflon dielectric that forms the seal between the pressurized and unpressurized sides of such connectors, and it is my hope that we can simply drill some holes in the Teflon to

allow gas to flow through. Worst case, if that can't be done, is that we will have to get a separate gas barrier EIA connector to put on the bottom of the antenna, then plumb from the gas port on the top connector on the line to the gas port on the antenna gas barrier with a piece of tubing. Obviously, that is not the best way to go. I don't want a fragile piece of plastic tubing exposed way up there on the top of the tower. So hopefully we can figure out another way.

Once we're done with that project, the Wheatnet-IP project in our studio facility will get underway. All the equipment, including LXE control surfaces, blades, power supplies, mic processors and Cisco switches, is on hand and ready to be installed. When we wrap this up, our studio facility will be 100% AOIP, the second facility in our company to make this transition (KBRT was the first last July). We're excited to complete this upgrade, especially as we emerge from a pandemic lockdown and with the lessons we learned fresh in our minds.



Steve Cuchetti and Nautel's Nelson Bohorquez had to do some contortions to replace the backplane in the WMUZ NX50.

Detroit Progress

In Detroit, Mike Kernan continues to make good progress with the pile of projects and issues there. Last month, with the help of Nautel's Nelson Bohorquez, got the backplane replaced in the WMUZ(AM) NX50 transmitter. This was a project that had been pending for months, with one module not communicating and offline. That was quite a project, but they got it done in a day and now that transmitter is 100%. Thanks to Nelson and also to Jeff Welton for helping get Nelson to come over from Chicago for this difficult task.

The holdup in getting the NX50 fixed had been the lack of a working auxiliary transmitter. The Harris DX50 has not worked since last fall and has numerous problems, and it has defied all our efforts to repair it. Last month, we made the decision to abandon that effort and connect the Harris DAX-5, which was at one time the auxiliary transmitter for that station. Mike did that and got it running and sounding great. That gave us the flexibility to dive into what amounted to a heart transplant on the NX50. I was unwilling to undertake that operation without a working aux to fall back on should something go wrong.

Also last month, we brought in a tower crew from Radicom over in La Grange, Illinois, to fix the Part 101 microwave link from the Detroit studio to the WMUZ(AM) site out near the airport. Radicom is a technical tower crew, technicians and not iron workers, and they were able to diagnose and fix the problem, replacing the Trango POE/suppressor up on the tower. They also completely reworked the on-tower Ethernet and power wiring, which was a class-A mess. Mike built a new splitter for the -48V POE and our friends at Radicom installed that while on the tower, removing an unused power supply along with the rat's nest of old wiring. I'm happy to say that the link is back up, better than ever. This represents the last major item of damage from the lightning strike to the 500-foot tower at the studio in late March.

One other item that Mike discovered was the lack of audio feeding the 950 MHz primary STL that is the primary link to the WRDT daytime transmitter site in Monroe, some 35 miles south. The problem was found to be a dead D/A converter. A replacement has been ordered and should be in place by the time you read this. Evidently the audio processor's automatic failover switched to the internet codec feed when the 950 MHz STL audio was lost and no one noticed. Is this A/D converter failure also related to the lightning damage from late March? Probably, but there's really no way to know.

It's my hope, by the way, to get Mike writing in these pages in the coming months. I know many of you would love to hear from him. For the moment, however, he is up to his elbows in issues, so we'll give him some time to get ahead on that before we task him with a monthly column.

Odds and Ends

Elsewhere, at KCBC, Steve Minshall at long last got the new AM-IBOC exciter and Exporter Plus exporter installed and working on the ND50 auxiliary transmitter. This was the third try, after there had



A much neater installation on the WMUZ tower: The gray box is the POE/suppressor for the Trango Apex Lynx microwave radio on the tower at the WMUZ studio. The black device is a 48-to-24 volt converter for the Ubiquiti Powerbeam radio.

been issues with the equipment on the first two tries. Was that pandemic related? My guess is that it was, with personnel sharply scaled back during the lockdown. My hat is off to Steve, who worked diligently to get this project done, and to our friends at Nautel, who worked through the issues. I know there were frustrations on both sides.

At KBRT, the BW Broadcast TX50V2 FM transmitter failed last month. It suddenly stopped

putting out any power. Fred Folmer swapped it out with a backup and will repair the TX50 shortly. He also got the Potomac 1900 antenna monitor back from factory repair and reinstalled. One of the channels had some non-linearity that resulted in incorrect parameters being indicated during low-power night operation.

We still haven't made any progress on cleaning up the spur on the KLVZ 94.3 MHz transmitter, and it is 100% for lack of trying. We continue to operate the transmitter at 85% power under an STA, which keeps it spur-free.

At this point, I'm thinking we'll wait for cooler weather. Further troubleshooting is going to be a physically difficult task. Adding heat to it will only make it more so. Thanks to all of you who offered suggestions. I have many of these on my list of things to try when we get back to it.

Be Careful

It's easy to let our guard down after so many months of social distancing, wearing masks, hand washing and all that. I frequently find myself completely outside the zone, so to speak, and have to remind myself that there are still dangers out there. People continue to contract the virus, and for some it is still deadly.

So I will remind you to remind yourselves and others to continue taking precautions. Whatever measures your local managers have put in place should be followed. Some resist this; you should not. Lead by example, and above all, stay safe!

Brian Cunningham's mom passed away and at press time he was away dealing with that. Keep him and his family in your prayers. His column will return next month.

News from the South
by
Stephen Poole, CBRE, AMD
Chief Engineer, CBC-Alabama

Hey, have I ever mentioned the weather here in Alabama? Lots of rain lately, storms, high winds, lightning – you know, the usual. As I write this, more storms are coming through. It's a beautiful thing.

With the COVID-19 looming all over us, things still haven't returned to normal. Many businesses have reopened, but hours are limited, you have to wear a mask and all that other stuff. Many smaller businesses have closed permanently, which is beyond sad. But we'll make it through, with God's help. As others have pointed out (and as no few online memes have illustrated), it is a little silly that Lowes and Home Depot could stay open, but the mom and pop hardware stores had to close. If you're out and about as much as we are, you can also see the crowds at the grocery and convenience stores. The latter are especially amusing: inside a small convenience store, it can become a crowd of rumps and elbows, with not a face mask in sight.

But it is what it is, and God is still in control.

WXJC FM (101.1)

Sometime around 8:30AM on the morning of June 8th, we were informed that 101.1 in Cullman was off air. I was closest, so I drove up there to check. Like you folks, the entire time that I'm

enroute, I'm thinking about what it could be. The generator didn't start? Tripped breakers? Something worse?

As I got closer to Cullman, I noticed that the tower lights were out. Oh, boy. This was some kind of utility failure and the generator had obviously failed. I hurried to the site, switched the Ford to 4-wheel drive and headed up the road to the transmitter building. It was raining and cloudy. A quick glance at the generator showed

an "over temp" alarm. It had cranked, but had then shut back to protect itself. While Todd called Cullman EMC to get power restored, I took a closer look at the generator. When I popped the radiator cap (something that must be done *very* carefully, and with a long stick or pole), it hissed – but only steam came out. Oh, boy.

I ran to buy some antifreeze and poured it



into the generator while Todd called our local generator service guy. Perry immediately came over (may the Lord bless him!) and brought plenty of antifreeze and water of his own. Meanwhile, Todd showed up as well. To make a long story short, at length we had the generator running and were able to get back on air. All in all, we were off for a little over two hours.

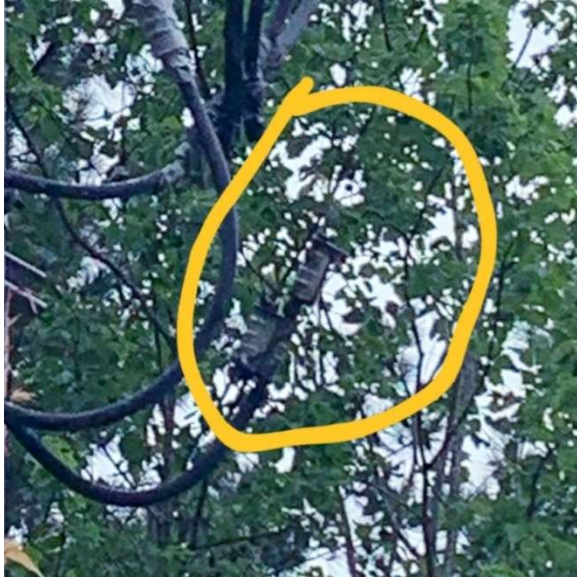


Figure 1 -- Cloudy, rainy, yucky ... and a broken wire.

Now for the utility. Like most utilities, Cullman EMC has automated monitoring for outages. In other words, if you report a power outage, the first thing they'll do is check their system remotely. Todd called them, but they said their meter showed normal activity. Hmmm! Todd then looked closely at the service entrance and noticed that one of the three phases had come loose at the building (Figure 1). Aha! He called Cullman EMC again and told them what we'd spotted, so they dispatched a crew. When they arrived, they looked at the service entrance and said that the wiring was burned into the conduit and would need replacement before they could restore power.

That left me scrambling for a local electrician who could come do an emergency call. A guy named Nathan was willing to leave another job and showed up, ready to go, cable in the truck. Only one phase had burned (Figure 2), but this site is odd. I suspect that when it was originally built, they only had a single 3/0, 3 phase service. At some later time, they added a second 3/0 service in parallel, in a separate conduit to increase the capacity to the equivalent of 4/0. A technically nice solution that

nonetheless complicated things. But Nathan did a quick and fabulous job; we called Cullman EMC back and they sent the same crew. Service was restored, the generator shut down and Perry was able to finish servicing it. We were back on utility power, everything looking good. I even gave the electrician and the Cullman EMC guys a nickel tour of the site while they were there.



Figure 2 -- One phase at the service entrance got a bit warm.

Some thoughts on this one for future reference. First, while automated reporting is handy and usually works, a case like this one will slip through the cracks. That's why we *always* go to the site to check on things if we suspect a power outage. Second, thank the Lord for Todd's eyes. It was a cloudy, rainy day and his vision is better than mine. He spotted the loose phase on the service entrance, and thus, has earned another Gold Star. Third and finally, *don't forget the NOTAM*. Our lights were out, and Jack called and informed the FAA. This isn't just a CYA, this is common decency. I'd hate to be responsible for an airplane crashing because our tower wasn't flashing. And that tower is not painted... it HAS to flash during the day.

Oh, right. The generator. Perry at first thought that we had a leak in the radiator, but eventually discovered that it was just a really bad blockage. We check the coolant, of course, but this particular blockage managed to stop the radiator from flowing well all of a sudden, which boiled out the coolant (you can still smell it on the generator, weeks later). Pouring the distilled water into it on the day of the failure apparently dissolved enough of the clog to get it running. Perry later did a full service and cleanout.

HVAC Woes

Cullman has another problem that has only been partially fixed as I write this. In mid-June, the building became hot enough to bake bread. That's hard on an old tube transmitter, but at least they're designed to run warm. A solid-state transmitter, on

the other hand, wants to be nice and cool. If it runs hot for too long, you're gonna be replacing stuff. (Ask me how I know.)

When I got there, the building fan was on, but outside temperatures at the time were in the 90s, so it was well over 110 degrees in the building. I had no choice but to reduce power for a bit to help cool things off. Meanwhile, we called K&S Service, our go-to for AC repairs. This building has two wall-mounted 5-ton units for redundancy, but neither was working. They were able to repair one; it needed an outdoor fan. The second, though, needs a new evaporator coil, which is still on order. The building is cool enough to stay on the air at full power, but thank the Lord for that backup fan system that we installed a few years ago.

92.5 in Pumpkin Center

With all the bad weather, I've been surprised that this site hasn't had more trouble. In mid-June, though, we received a really odd complaint: the station "sounded funny." Hey, I don't know about you, but the joy of my career is getting a comprehensive, detailed complaint like that. I was working on 850 in Tarrant, so I dispatched Jack to check. (Todd was on vacation.)



Figure 3 -- These two different readings were two seconds apart.

Jack said that the logs on the GV3.5 transmitter had repeated "high temperature" alarms for module 1. I left Tarrant and headed to the huge and happy metropolis of Pumpkin Center, AL, returning Jack to the studios. When I arrived, I saw the same alarms and called Nautel. I had already planned to swap the modules to see if the problem changed, and Ryan with Nautel did indeed suggest that, first thing. I swapped the modules ... and everything seemed OK. Huh. We'd have to keep an eye on this one – not easy, as this is the only site in Alabama that can't get high speed Internet service or a data link (the tower won't hold the weight of the needed dish).

In time, though, the problem started

reappearing, still on module 1. That told us that the problem was in the backplane, and not in the module itself. Figures 3 and 4 show what I was seeing: the power and temperature would flicker. The actual high temp shutbacks were very short; less than 1 second. There's no way the heatsink could jump to a dangerous temperature, then back to normal, that briefly. Ryan at Nautel said that they'd had problems with the data acquisition chips on that backplane, so the entire board would need to be replaced. It's enroute to us now.

Parts Availability

In the various engineering groups on Facebook, it has become common for one of our fellows to post a request for info about a part that is no longer available. I'm afraid that this problem is only going to get worse in the future, and, except for a few specific cases, you can't blame it on our equipment manufacturers. The actual problem can take two forms: First, the part may be available, but only in a new package (example, the old board had a plug-in chip, but only surface-mount is being produced now). Second, the part is no longer being made anywhere by anyone.

Long time radio engineering folks have always just assumed that the manufacturer (or someone) would have critical parts, even for 30-year-old equipment. That's simply not the case and the problem has been growing for decades. Not long after I moved here to take the job with Mr. Crawford, I was told that a small AM back in NC had to go dark because they couldn't afford a replacement transmitter (new or used). They had an all-tube monster that was a clone of a CCA (itself no stellar performer). It wasn't so much the big output "jugs;" the exciter and drivers used small signal tubes that simply couldn't be had. Even the Russians and Chinese no longer made them. So, they shut down and turned in the license.

That's an extreme case, but it illustrates the problem. The most recent one I saw on Facebook was a guy with a 2007 Harris transmitter. The display had died and Harris said, "no longer available." Fortunately for him, it's just the status display – an old 3-line fluorescent design – but that means that troubleshooting might be considerably more difficult for him in the future.

We've run across this ourselves. No one is better at support than Nautel, period. Better still and to their great credit, they try to use off-the-shelf stuff whenever possible. But even they sometimes have trouble finding parts for older transmitters. In these pages, I detailed our problems with the primary AC

contactor in our 20-year-old XL60 last year. We found a suitable substitute, but had to custom-craft a mounting plate for it.



Figure 4 -- What a tornado will do a 5-million-dollar airplane.

This frustrates, but also amuses me a bit. During my career, I've run across so many engineers who think it's anathema to modify or substitute. To their way of thinking, if it doesn't precisely match the original schematic, or isn't at least covered in a sanctioned manufacturer's upgrade, it should never even be considered. To those guys and gals, I say, "good luck in the future." Back in NC, I had already developed a reputation as the guy to call if an older

unit died, and parts weren't available. I had resurrected quite a few ancient transmitters.

(Sometimes I even got paid. Long, sad story. It goes without saying that if a station can't afford a good used replacement transmitter, they're likely going to have trouble paying you as well. Just one of many reasons why I took this job when it was offered, and thanked God for it. Loudly.)

That's it for this time. But don't show Cris Figure 5; it would make him very sad. Someone else needs to insert it into the *Oscillator*. This passed me the other day on I-65 as I was headed back to Birmingham from Cullman. It's the wreckage of a 2018 Pilatus PC-12, a luxury 8-12 seat turboprop that is very popular for business aviation and charter use. Anyone who flies in general aviation wants a plane like this (and the money to support it – whether they'll admit it or not).

I couldn't find a crash report for that registration number, but the best guess is that this particular plane, registered to a "Delta Leasing, LLC" in Nashville, was probably sited at John Thune airport. It was hit by a tornado some months back. I took that picture while driving; believe me, that plane was destroyed. You can't see the half of it. Someone lost a 5-million-dollar airplane in a matter of seconds. Sad!

Until next time, don't give up, remember that God is in control, and *keep praying for this heart-sick nation!*

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

WPWX Auxiliary Site

At the time of this writing, we are just putting the finishing touches to the inside RF plumbing on our newly installed Nautel GV20 transmitter at the Lansing transmitter site. We had previously attached it to the current 1⁵/₈" transmission line that leads to the new dual-frequency FM antenna on the tower.

This setup will serve as a backup for WSRB and also as an auxiliary site for WPWX. We are waiting for the larger transmission line to arrive, and once that does, we have a tower crew contracted to install it. At that point we will be able to put WPWX on at that site at 18 kW.

While this will not be a full signal auxiliary site, we believe it will cover the critical neighborhoods for the station and give us much needed insurance that this station will always be on the air.

Wheatnet Conversion/Control Room Rebuild

The Wheatnet equipment for the conversion/rebuild of our four control rooms in our Hammond studios has arrived. With the RF plumbing just about done for the WPWX/WSRB auxiliary project, we are focusing on the first studio.

The one thing that we don't have on hand yet is the new studio cabinetry. That's because we really don't have a place to store it. So, we will receive each studio's new furniture as we need it.

We are purchasing custom built cabinetry from Designcraft, which is in Benton Harbor, Michigan, about a 90-minute drive from here. So, as we tear out the old equipment and cabinets, Rob Smit, from Designcraft will deliver the next studio. This way we are never storing a unit.

We are very excited to be moving the facility to all Wheatnet, with Wheatstone LXE-24 control surfaces. I believe the staff will also really love the new cabinetry. It looks great and will be much better in design to how the current staff is allocated logistically.

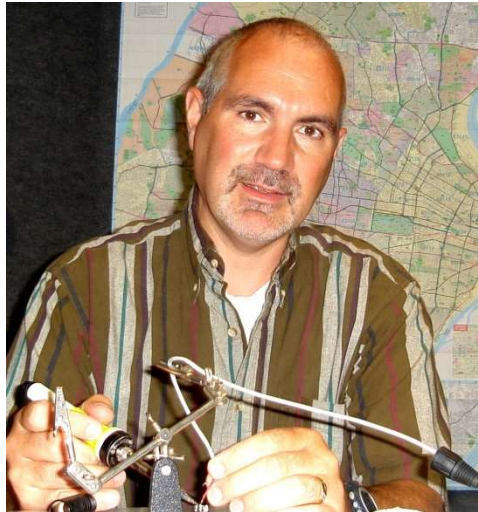
Another part of this project that had to take place was to expand the WPWX control room. It was very small and

constantly crowded, especially during brokered shows. It would have been impossible to install the newer cabinetry without any expansion. We took part of an underutilized room that was adjacent to the studio to add another linear five feet to the length of the room.

The work on the expansion is now complete and we are set in that room to convert and rebuild it, as well with the new equipment and cabinets.

My hope is that by the time that I am writing next month's article, we are done with our first room and well into doing so in the second room in the conversion/rebuild process.

In the meantime, below are a few pics to show our progress.



The Local Oscillator
July 2020



Construction is underway enlarging the Power92 control room.



Brian Bonds (left) and James Kelly do the 3-1/8" plumbing for the WPWX/WSRB aux.



James fits a 3-1/8" elbow for the WPWX offsite auxiliary at the Lansing site.

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

A/C Issues at KLTT

It seems each year we have a variety of A/C issues at our transmitter site. This year was no different. The only thing that you could consider different was that I was out of town for the weekend and Keith was gone out of state. One Saturday afternoon I got the dreaded text saying the KLTT transmitter building interior was at 85 degrees. I immediately looked into it, turned off the A/C thinking it was frozen, and then lowered power on the transmitter.

We have an exhaust system that is supposed to kick on at 85 degrees and suck out the hot air, replacing it with outside air from a louvered intake in the back room. Of course what I realized later was that since we left the door to the back room closed, the heat mostly stayed inside. The exhaust fan is in the ceiling of the front room, which made sense years ago because those ginormous ND50 pulled in air from the rear and exhausted it out the front. But the small NX50 pulls air in the rear and exhausts it out the top, both in the back room.

I knew the system was supposed to kick things over to the backup A/C unit on its own but weren't sure what that temperature switchover was. I waited and waited. It got close to 100 degrees in the building and still nothing. It would be a three-hour drive to the site, so I decided to leave it until the next morning when we were going to leave for home anyway (it was already evening and cooling off from the heat of the day). My husband and I just ended up leaving a bit earlier than normal.

We got to the site and checked things over. All I needed to do was reset the main unit. We have a switch on the back wall that allows us to switch to the backup and back to the main, which resets the main unit. For some reason, the unit kept shutting itself off, although no breakers tripped. We hung out for a while and waited for it to start working.

The next Monday I called the A/C repair company and they actually came out pretty quick. The guy checked things over, but since all was

working by then, he couldn't really figure it out. It tripped off again a day later and I was able to get someone out pretty quick. He looked things over and spent the better part of a day at the site. He found the unit had an air leak and said he fixed that. That could have been the source of the problem that was causing the unit to quit working.

The second issue he needed to figure out was the switchover temperature to the backup unit. After working on the sensor and control unit for a long while, he was finally able to get into the menu. Typically, you'd push the menu button for two seconds and it would enter the menu mode. What we found, however, was on this unit the soft key "button" was not where it was supposed to be and was actually slightly above the menu button. He got into the menu and found the switchover temp was 120 degrees!!! That is absolutely crazy, and had our building gotten that hot, there is no doubt that the equipment would all melt into a puddle. He changed it to 85 degrees, which will be perfect for us. We haven't been able to give it a real-world test, but I trust that they got it working this time.

Front Light at KLTT

We have one light on the front of the building at the KLTT site that was installed above the awning above our door (the security light was actually there before the awning was installed). That unfortunate location meant there was no light to see the door at night. I finally decided to deal with it and got my dad to help install an additional light under the awning. Not a big deal – we got the super-bright LED security light installed and that door was in daylight!

The issue we had was that the lights both stayed on always. The top one has been messed up for a while and the photocell that's built in keeps in on. The new one is just on or off (no internal photocell), so I had an idea to install a timer switch. I have one of these at my own home for my porch



lights and it works great.

Trying to install it was a bit of a chore. Once installed, though, I was able to set up the timer to turn the lights on at dusk and off at dawn. This way we aren't wasting energy, although not much is actually used for the LED fixture (but the sodium light above it draws 175 watts), and it just looks better having the lights off during the day.



The new timer switch at the KLTT transmitter site. Yes, the interior light switch is THAT dirty!

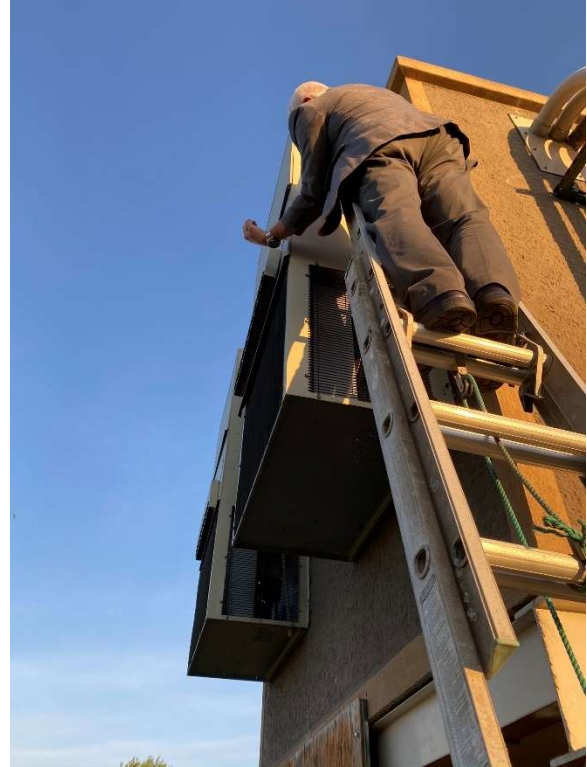
So far, after a month, it has been working flawlessly. It has also helped with the moth population. Instead of having a bright light attract them all day long, it only does anything at night, and the miller moths are finally moving away and not causing near as many issues as before.

A/C at KLVZ

Remember how I mentioned each year having A/C issues? Well, later on in the month, I received an A/C fail alarm at KLVZ. We have two units here too and these are supposed to be smart enough to automatically switch when one fails, but that never seems to happen. I'm sure one day I will have someone look into it. I had pretty much decided right away the issue was the filters. These self-contained wall-mount units are tough to get to. They

wouldn't be if the building was not ten feet in the air to keep it out of the flood plain, but as it is, they are waaay up there! So they sometimes get neglected.

Being the loving daughter I am, I decided to let my dad get his hands and suit dirty so he feels like he accomplished something out in the field. We set up the ladder and up he went. While up there, he found several stripped out screws and the fresh air intake panels about to fall off. So after changing out the filters, he was able to get things temporarily secured. We decided to let Keith re-drill some holes when he got back into town.



The old man waaay up there, working on one of the KLVZ A/C units.

One thing about these particular A/C units that amazes me is how they were built. Why not put latches around the panels that would need to be removed often instead of using screws that will cause the hole to get stripped out after a few times of removing them? Use latches where the filters go, since that will be where access is needed most. I'm sure at the time the company had their reasons, but now, ten years later, it irks me knowing we have to do more work to keep it secured.

Satellite

One issue that we've had for a long while

now is satellite audio levels. Aggravating the issue is the fact that the satellite receivers are located at the KLZ transmitter site and are transported back to the studio using an old Harris Intraplex-IP system. I believe it is over 20-years old. To adjust the levels on the codec cards, you have four or five indicator lights to work with. It's not really an exact science, just an "idiot light" of sorts to somewhat show us where things are.

I have been getting complaints on and off for years because certain shows will set off our silent alarm due to the levels being so low. Also, complaints come in about DRR levels when certain satellite shows are recorded and played back. While the XDS satellite receiver will record and replay a show for us, we also DRR that show when we do air it so we get our spots, promos, liners and other material in there for backup or a replay later that day or weekend. It allows our people to not have to go in and cut it up into segments, but instead, just re-air the show in its entirety.

We carry one show live via Amb-OS, and that is where the main issue is. The show is normally low for us and has been for years. Other markets have also complained about the low audio levels on the program. I should check with them to be sure, because as I write this, I'm having ideas to remedy the problem for us. I cannot get the audio any better by adjusting the card on the Intraplex (which in any event provides only an attenuator and no gain). I put in a support call to Amb-OS, but from the sounds of things, I don't think they will be offering any help as I was told the show arrives hot to them and they bring it down just a bit to a good level before sending it out. Maybe other markets are putting up with it, maybe there is no issue with them and it's just me and I haven't figured out the solution yet. I will keep working on a way to resolve this though, so we can be sure to have the best audio on air.

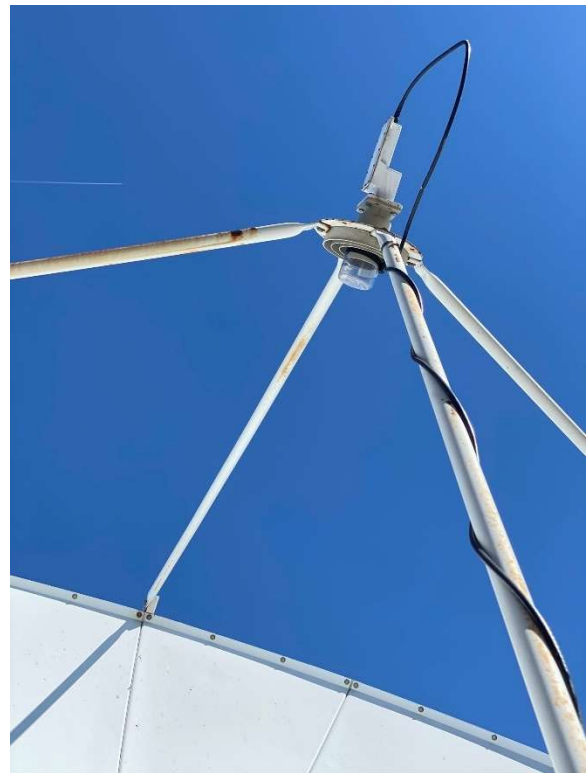
Fuel!!!

We had a blue-sky power failure at the KLZ transmitter site late last month. It was an Xcel Energy issue. They had confirmed a piece of equipment failed, causing a major outage. We are so very grateful for the 1946-vintage generator at that site. It ended up running for five hours, keeping us from losing any money from paid programs being missed.

We went out a couple days later because we knew we wanted to fill the Diesel tank back up for the generator as well as get our portable tank filled for future use. It ended up taking two trips to fill up the portable tank before we could get the generator

full. It was nice being able to work outside on a nice day. This will also give us some fuel the tractor for mowing, if that ever happens.

You might recall me saying how I was planning on mowing this month. That didn't happen. Not because I got too busy but because the growth stopped. There for a while things were growing up fast then it all just stopped. Keith has taken care in and around the buildings and towers, but the fields aren't bad at all. I am hoping we can wait until the fall, when it is a bit cooler, to take the tractor to the sites. I want to mow down what has grown up and then use the bucket to carefully destroy some prairie dog holes so driving around the sites aren't painful.



My water bottle feedhorn cover. Goodbye, wasps!

Wasps!

I was told that the Amb-OS show we receive wasn't there and that they had to air a backup. I immediately logged into the unit and saw no signal. I pretty much figured it was wasps. We don't have a cover on the LNB for this unit and they like to get up in there and nest. I was able to get the nest out without getting stung, thankfully. I found a water bottle that Keith left and cut it, dried it out really well and was able to place it over the hole and used a wire tie to secure it. My hope is that this will last for a

good long while and prevent any more signal issues from these insects.

J1000 Damage

We had some storms roll through the last weekend in June, and one thing we have learned is that the J1000 at the KLDC site does not like storms. We had issues before with the ND-1 and hoped the newer transmitter could ride through better, but the opposite is true. Storms take the transmitter down quickly. It doesn't help that this tower is at the top of a hill, the highest point within the Denver city limits, with nothing else anywhere near as tall for miles around.

I was able to get it onto the auxiliary transmitter with no issues and ran at low power for the duration of the storm. When it passed, I tried putting it back on the main with no luck. The transmitter would come on but would not make any power. Logging into the NX-Link just showed me the A exciter wasn't working. I figured neither were working.

I headed out to the site early the next morning and looked things over. I didn't have time to dig into it too much. After some troubleshooting, I was able to get it to show me the various alarms. Up until this point, it was just Exciter A, but finally it showed me the power supplies had failed and both exciters as well. Thankfully, forecast was no bad weather for another couple days so I left it running on the aux.

My dad and I went out a couple of days later and began really looking into it. Pulling the A power module and going through the troubleshooting guide, we found several components that were bad and replaced them. We then moved on to the B power module and did the same thing, finding nothing but an IC bad. We plugged both back in and immediately the A power module went BANG, causing me to jump.

We opened it back up and found the modulator driver IC blown – literally! We began troubleshooting again and found numerous other issues once again.

Another thing, most likely the cause of all of this, was an 1/8-watt 33.2-ohm resistor that was small, hidden next to another big item with a wire going over the top of it. Very difficult to see. I saw it and saw it was burnt to a crisp.

We replaced everything, plugged it back in and still saw the module was giving a fault. No BANG this time, but no power output from the A power module (the B module was putting out power). We did some troubleshooting with the diagnostic

display and found that the A module had no PA volts. A clue!

We took the module apart even further and found a Zener diode that was shorted, or close to it. We replaced that, and thank God, the module came



"I think I see the problem..." -- Dad just has to get his hands in a transmitter every now and then!

back up, putting out full power!

We are very grateful we have a good spares kit with all the parts we needed. I have since ordered more to replenish what we used.

Upcoming

I am looking forward to the Fourth of July weekend. I will be taking some extra time off and going to Red Feather Lake with my husband and his family. I missed it last year due to being sick. It is always such a joy to spend time with family and being able to get up and walk just a little ways to the lake to fish. We have a habit of spending all day every day on the lake.

At this point, I don't have any definitive plans for work. Major projects are on hold for now, so it is just maintenance issues I'm working on. I have no doubt things will pop up as they always do, but for now, I'll enjoy peace and quiet. I pray you all continue to be safe.

The Local Oscillator
July 2020

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

KKPZ • Portland, OR
1330 kHz/97.5 MHz, 5 kW-U, DA-1

KLZ • Denver, CO
560 kHz/100.3 MHz, 5 kW-U, DA-1

KLDC • Brighton - Denver, CO
1220 kHz, 660 W-D/11 W-N, ND

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

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

WDCX • Rochester, NY
970 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
970 kHz, 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, 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

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

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

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



Corporate Engineering
2821 S. Parker Road • Suite 1205
Aurora, CO 80014

email address: crisa@crawfordbroadcasting.com