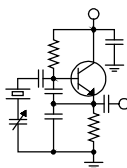


# The Local Oscillator



## *The Newsletter of Crawford Broadcasting Company Corporate Engineering*

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### **Projects!**

As the first quarter of what is no longer the new year winds down, we press forward with a number of big projects around the company, and we are working on the continuation of a project we started last year. I mentioned most of these in last month's column, but in case you missed it...

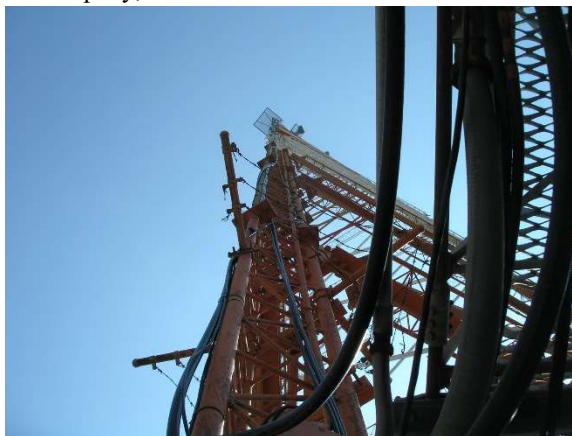
The continuation project I mentioned is an off-site auxiliary for WPWX Power92 in Chicago. I have for a long time had concerns about recovery should the WPWX tower come down or we sustain some other devastating calamity at the Burnham transmitter site.

This was brought home more than a decade ago when a non-commercial station on an adjacent channel in Joliet, Illinois lost its tower in an ice storm. That tower fell because the guy anchor steel had corroded below the surface and no one had any idea of its condition. The tower picked up a load of ice, then came the wind, and one (or more) of the anchors gave way. The tower came zigzagging to the ground, taking the station off the air for days while they scrambled to find a temporary site.

Our own WPWX shouldn't face such an issue with anchor steel. When we built the tower in 1989, I knew that we had a natural gas pipeline running along the north side of the property, and that pipeline employs cathodic protection. To keep the anchor steel from becoming sacrificial, we encased it in concrete all the way to the surface.

Still, anything can happen.

During my years in the Dallas/Ft. Worth market, on two occasions, airplanes flew into radio/TV towers. I was working at KERA-TV in



**Our Lansing, Illinois tower, home to WSRB and soon, the WPWX off-site auxiliary.**

1979 and on my way to work at the Cedar Hill transmitter site one foggy morning when I saw something odd in the grassy median of Hwy. 67 right in front of the 1,549-foot tower. As I drove past, I remember thinking that it looked like an airplane wing! Turns out it was an airplane wing! A plane had flown into one of the guy wires in the fog and crashed, killing all aboard. One wing was severed by the huge guy cable and came to rest out on the highway. The tower did

not come down, but had the impact occurred on tower steel instead of a guy wire, or if the guy had been severed, it certainly could have.

Then a few years later, in January of 1987, an F4 Phantom jet out of the Dallas Naval Air Station collided with the Hill Tower candelabra a few miles west, also at the Cedar Hill antenna farm. Thankfully the aircrew ejected safely, but there was significant damage done to one arm of the candelabra, forcing two low-band TV stations and several FMs to aux antennas on the tower.

It was that hit on the Hill Tower that woke a lot of folks up to the need for an off-site auxiliary. Had the tower come down, a lot of FMs and a lot of TVs would have been dead in the water. Shortly thereafter, we began seeing competing stations working together to put auxiliary facilities on their

competitors' towers. Of course we all got a reminder of this in a big way following 9/11, when a bunch of stations lost their sites in NYC.

And throughout the years of my career, I have read time and again of towers coming down because of rigging errors, hardware failures, tornados, and even as a result of a tractor mowing the antenna field snagging a guy wire. Indeed, anything can happen at just about any time.

While it's true that just about any radio station can be severely impacted by the loss of a tower, in our company, WPWX is unique. It is in a highly competitive situation in the #3 market. If the station were to go dark, all the listeners would hit the button for a competitor's station, and getting them to come back after weeks or months off the air would be a herculean task. It is with that in mind that we began thinking about an offsite aux for that station several years ago, and in the past year, with Chicago engineering manager Rick Sewell driving the train, we began working toward that end in earnest.

I recently filed an application for the WPWX offsite auxiliary, and we're awaiting grant. When we get that, we'll be able to operate with 17 kW ERP from our Lansing tower site, just a few miles south of the main WPWX site. That should get us core market coverage. Until we get that grant and purchase/install the 20 kW transmitter and 2-1/4" transmission line, we will be limited to 4 kW ERP and emergency-only operation under §73.1680, but at least we have a place to go if the worst should happen.

Also in Chicago, we're preparing for an omnibus studio project, replacing the now 15-year-old Wheatstone bridge router TDM system with a new Wheatnet AOIP system. Much of the infrastructure is already Wheatnet AOIP, but not the control rooms. That will change in the coming months. But along with that we are enlarging the WPWX control room and replacing the cabinets in all the control rooms. Over the last month, we finalized the design and equipment list and will be placing orders shortly. We still have to work out construction and cabinet details as well as scheduling. And of course we have to keep playing the hits during the construction work.

We have two projects in the works in Birmingham. The new Slatercom-provided Dialight strobe system for the 1,330-foot WXJC-FM tower near Cullman, Alabama has arrived, and Stephen

Poole has it stashed in a self-storage warehouse nearby until Slatercom's installation crew can get it installed on the tower. That should take place this month.

The lights on that unpainted tower have been a big pain in the backside since we've owned it. We nursed along the original strobe system for several years after we bought the station, but its controller was obsolete and no longer supported – if I recall correctly, the manufacturer was long out of business by that time. In 2007, we replaced that system with a new Xenon system from TWR Lighting, thinking that would solve our issues and make it trouble free, and that was true for a short while. But within a year or two, we began having trouble, and we have struggled with that system for the past 13 years. The tower has been under NOTAM for one issue or other for much of that time. We have probably spent over \$100,000 in tower climbs alone through the years trying to keep the system working.

The new Dialight LED strobe system includes all new wiring plus flash heads and controller, and it will be installed by a crew that specializes in such systems. And it will be backed by our friends at Slatercom. I am confident that our tower light issues will be resolved with this new system. Of course, if we take a big lightning hit, all bets are off, but so far, we have not had any failures of similar systems at other stations, so hope springs eternal.

Also on tap for Birmingham, probably this month, is the installation of a new Nautel NX50 transmitter at WXJC(AM). Stephen and his crew have been preparing for that for some time now, and one sticking point has been the electrical work. The bidders did not seem to understand the scope of work and they came back with sky-high quotes that included all sorts of things we don't want or need. To clarify things, I went to the KLTT transmitter site and took photos of the electrical installation there. Stephen was able to provide that to the bidders, and hopefully we will shortly have much more reasonable bids.

### **Detroit**

We continue to search for a chief engineer for our Detroit market. This is an excellent opportunity for the right fully-qualified candidate.

Send anyone interested in applying to me at [techjobs@crawfordbroadcasting.com](mailto:techjobs@crawfordbroadcasting.com).

**The New York Minutes**

**By**

**Brian Cunningham, CBRE**  
**Chief Engineer, CBC – Western New York**

Hello to all from Western New York! In what usually is a quiet month, February turned out to be anything but normal. Between Rochester and Buffalo, at times it seemed as if the wheels fell off the wagon. I was bouncing from one issue to another. I was hoping to get a lot marked off my ever present to-do list, but transmitter issues, internet (PSD) problems and satellite reception failures kept me from getting to those items that have been back shelved for awhile.

Last month, I reported on an issue I discovered with the WDCX-FM Continental auxiliary transmitter, specifically corrosion around the front panel of the PA cavity. On Monday, February 3rd, with Dremel tool in hand, I set out to get the corrosion cleaned from that area and around the finger stock lining the inside of the cavity door. This work went very well. I was able to get all of the corrosion removed using a wire brush at very low speed, following up with some very fine sandpaper.

Once completed, I got everything buttoned up and went to place the transmitter on-air to ensure that there was no more arcing in the PA cavity. I pushed the plate on button after the filaments had ample warm-up time. The plate voltage pinned with no current, and the IPA indicated massive reflected power. As it was already late in the day and I was tired, I elected to come back later after I had rested and a fresh mind to troubleshoot this new issue.

The next day, I returned to investigate this new problem. The final tube in this transmitter was installed back in 2016, and it was a new tube then. Because it had very few hours on it, I did not suspect a tube failure. I started by checking the drive from the exciter to the input of the solid-state IPA and found it to be satisfactory. I then removed the BNC connection from the input of the grid circuit and plugged the exciter directly into the transmitter, bypassing the IPA, with the same results as before – plate voltage and no current.

Next, I checked the output of the IPA into my load through my Bird wattmeter, and found the IPA to be in perfect working order. So I knew the problem was not in the grid circuit of the transmitter. I then removed the plate blocker and found additional corrosion, that similar to what I had just removed from the front PA door, along with corrosion on the air stack and the anode clip attached to the plate cap of the 4CX15000A tube! After thoroughly cleaning all of these components, the transmitter came up with normal readings across the

board!

I have contacted our HVAC contractor to come out and give us an estimate on re-configuring the exhaust stack of the transmitter. Basically, I want to remove the bottom 10 inches of ductwork and replace it with a suitable hood, which will allow the inside air to circulate within the cavity instead of the cold outside air. I will also add a 1-inch non-restrictive air filter over the exhaust port of the transmitter to help keep any airborne dust/dirt out of the transmitter. A complete and thorough inspection is in order to ensure that there are no other areas where corrosion could cause an interruption of service if called upon. This work will be moved to the top of my to-do list.

Continuing on with transmitter issues, in Rochester at WLGZ-FM, the final tube emissions were beginning to drop off, so a new National tube was ordered to replace the failing tube. On Sunday night the 16th, I shut the station's analog signal down to change the tube out and perform a thorough cleaning and inspection. The tube replacement went very well with no issues to note. The tube socket was in excellent condition, no bent finger-stock or accumulated dirt, except for the bottom of the PA cavity. A thorough vacuuming was performed along with cleaning of the PA cavity followed up by a complete wipe-down with denatured alcohol to



remove any residual moisture from the cleaning spray.

The tuning went very well, or so I thought. Two days after the new tube installation, the transmitter started shutting down with screen overloads. I returned on Tuesday the 18th and found the transmitter to be out of tune! The tuning was very near the max on the raise side of the tuning control, meaning the shelf needed to be raised. After a couple of adjustments, I was able to find the 'sweet spot' for the loading/tuning controls. Once I adjusted the PA grid tuning and grid coupling for minimum reflected on the IPA, all readings were very near factory settings.

I honestly do not know how I could have missed this during the initial tuning. I did not notice that I was reaching the upper limit on the tuning control; I never saw the limit LED light up! With solid-state transmitters quickly becoming the norm at most stations, and most of the tube-type transmitters being demoted to backup service, we don't get many chances to work on these, and many of the tricks of the trade we learned over the years are being forgotten.

I have numerous maintenance notes passed on to me by my late friend Dave Hultsman and his fellow Continental engineer, Steve Hasskamp. Many of these maintenance procedures go far beyond those found in the equipment manuals. They have been compiled after many years of servicing and finding better and easier ways to make repairs or insure proper operation for a long period of time. It certainly wouldn't hurt to pull these white papers out occasionally and look them over to keep these procedures in the back of my mind, if only I could remember where I put them!

Continuing on in Rochester, Earl Schillinger reported on an issue with our C-Band satellite system on Friday the 21st. Overnight recordings were not being received along with daily live programming received over Ambassador's SR-2 channel. When I arrived at the WLGS transmitter site (where the

satellite dish is located), I found the receiver to be in 'carrier searching' mode. I rebooted the receiver and everything came back to normal with an EbNo of 11.4.

After an hour or so, the receiver returned to the carrier searching mode, so I performed a hard reboot of the system. After the hard reboot, the receiver came back up and looked normal in all aspects, but it was not too long after that it faulted out again with the same symptoms as before. I brought my spare receiver with me to Rochester, just in case I found a receiver problem, so I swapped it out and that took care of the issue. I am not certain that Wegener is still supporting the Unity 4000 receivers, so I guess a call needs to be made to inquire if we can have the defective unit repaired.

Another issue in Buffalo this past month was the delivery of PSD data for HD-1, HD-2 and RBDS to the transmitter site. The data would hang up at times, or be sporadic in displaying the proper data. Armed with my laptop, I went out to the transmitter site and using port peeker, found that more than half of the data sent was not being received. We experienced this same issue some time ago, and the problem was found to lie with our internet provider.

We had recently experienced some high winds and power outages at the transmitter site, and I assumed that this is probably the culprit. The ISP, Spectrum, came out and replaced the terminal at the pole at the street level and resolved the issue.

We still will randomly miss a data change on the HD-2, and I suspect that may be caused by the router/firewall at the transmitter site. Somewhere in my shop area I have a spare Linksys router, so I will program it with the necessary port numbers and IP addresses to see if that clears up the HD-2 PSD issues. More on my findings next month.

That about wraps up another month here in the great northeast, and until we meet again here in the pages of The Local Oscillator, be well, and happy engineering!

**News from the South**

by

**Stephen Poole, CBRE, AMD**  
**Chief Engineer, CBC–Alabama**

Did I mention the weather last time? I'm sure I did. The rain continues. It rained again today. The rivers and creeks are over their banks, the ground is saturated and there is mold and mildew growing in places that I never noticed before. Ugly, ugly.

Needless to say (but I'm gonna say it anyway... you knew I would), this has kind of hampered a lot of our work in February. We've been running to our transmitter sites after every major storm just to make sure that no big damage has occurred. Fortunately, so far, we've been blessed – though I did notice the other day that some of the siding on the other side of that old building at 1260 AM has come loose. It's always something.

The ground at Tarrant, where I've been spending a good bit of time to prepare things for the NX50's arrival, has really become smushy. Going into the site requires that I walk through the mud to the gate, unlock it, and install the brick that we keep handy to prevent it from drifting closed. Then I head back to the Jeep, line myself up while still on the paved road, and gun it through the gate so that I don't bog down in the mud. There are large areas of that 40-acre tower field that I stay well away from, too. I've had to call for a tow out there several times.



**Figure 1 - I got a little worried when I saw this guy out of I-65 one day.**

**The NX50: Preparation**

Tarrant is where 850 AM's transmitter lives, and (amongst running for other things), I've been spending some time there making sure we're ready for the new Nautel NX50. It's said that as you get older, you start reminiscing and sharing stories with everyone within earshot. "Did I ever tell you about the time ...?"

Well, here's a re-memory: back in 1999, while we were rebuilding 850 AM's facility, one of the guys with the construction crew stared at the transmitters and phasor, then shook his head while the crew painstakingly built a wall over and around the equipment. He looked at me with a knowing grin. "What are you going to do if you ever have to replace this stuff?"

I just shrugged and said, "hire you to build a new wall." I pointed out to him that the equipment – a Nautel XL60, a Nautel ND2.5, a Kintronic phasor, and a rack full of monitors and remote control stuff – cost many times what the building did. I'll never forget the look on his face. But then again, being charitable, this guy wasn't the brightest light I'd ever met, so there you go.

That memory came back to me as I was knocking out sheet rock for the new NX50. We're going to remove the little ND5 (see Figure 2), then re-frame around the new transmitter. With judicious use of molding, putty and paint, we can make it look good. No doubt if we were replacing more than a single transmitter, we'd probably have called in a construction crew to do the work. But we're capable of hanging a little "rock."

I will say that I probably should have asked Jack or Todd to help with some of the work. All of the usual Keystone Kops stuff happened while I was working: for example, I'd carefully place my big level on the wall to get a straight line precisely the correct distance off the floor, only to discover that the mechanical pencil was out of lead. Take everything down, go get another pencil (and confirm that it will make a line first), then start over. I had a laser level, but the old sheet rock is painted a very light yellow





**Figure 2 - Installing a hole for the transmitter installation.**

color, and with the lights on in the building, it was too hard to see the line. Thus the 48-inch plain-Jane builder's level with a straight edge.

The electrical is another thing. We'll need to mount a fused disconnect and Nautel's interlock switch, with conduit as needed. It's really not that big of a job. We have received one quote, but it was considerably higher than we thought it should be. I've been waiting for days for another electrician to come look at the job, but I decided today I'd have to write him off and call someone else. He hasn't been returning my calls. Maybe he thinks my job is too small to worry with.

Anyway. Cutting out the sheet rock today with a reciprocal saw, of course white dust and chips flew everywhere. I had covered the top of the ND2.5 with plastic (you can see it in Figure 2 if you look closely), but I knew I'd still need to vacuum everything afterwards. First, I discovered that the shop vac needed a new filter. I put one in it. Then, when I fired up the vac and started cleaning, a fine, white dust blew out of the exhaust and hung in the air. Fine dust is death on a heatsink, so I stopped vacuuming, opened the front door, turned on the ceiling exhaust fan ... and it wouldn't come on. Yay! I finally settled on putting one of my old coats over the shop vac and doing it a little at a time to keep the dust down. Todd has called a heating/air company to come look at that vent fan.

As Cris says, it's always something. And like I said, Keystone Kops.

### **A New Transformer, Too**

When I met the first electrician at the 850 AM site in mid-January, I happened to notice that the big pad-mounted utility transformer out front was leaking oil. This is an emphatically un-good thing; if that transformer loses all its oil, you will, in short order, lose the transformer. It'll overheat and the windings will short. The Alabama Bubba in me will admit that it'd probably be spectacular – I'd probably even wear my NAPA hat turned around backwards and yell, “yee-haw!” – but, well, you know. We don't want to be off the air and stuff, so we called Alabama Power.



**Figure 3 - Not good. Not good at all.**

They sent a bunch of trucks and a big crew out to replace the transformer ... but there was a problem: they had been given a 240V/108V unit for the replacement, and we have a 480V/277V service. So, after tearing up the muddy ground and wallering around for a while, they announced that they'd have to leave and order the correct transformer. We're still waiting as I write this, but supposedly, the job will be done before the end of February. We'll see.

### **Cullman Tower Lights**

We slowly creep forward on this job as well. 101.1 FM has been under a NOTAM for years, primarily because the old strobe flash system kept breaking, and we were unable to keep it working reliably. Even though it was definitely an expense we didn't want, we bit the bullet and ordered a replacement LED system for installation this year.

The hope, as I write this, is that I'll be able to tell you about it next month – or certainly no later

than April. We'll need for the constant rain to let up for a few days in a row, but the tower crew already has their winch on site, ready to go. We have received all of the lights, and they're in storage nearby, waiting to be hung on the tower.

We have high hopes for this system. Frankly, I'm glad to see xenon strobes go the way of the dinosaurs, because they're temperamental, operate at ridiculously high voltage (on a tower!) (up in the air and bad weather!) and are very expensive to maintain. I'm not naive enough to believe all of the sales hype about the LED systems – "install it and you're golden for years and years!" – but I do believe that it'll be much more reliable than the strobes.

### Odds and Ends

On the personal front, I bought a new Acer laptop for my birthday. It came with a super-fast AMD Ryzen processor and a solid-state hard drive. When I booted into it for the first time, I was astonished at how quickly it reached the desktop. It literally took less than 5 seconds. For now, I'm going to leave Windows 10 on it and use it as my music workstation at home. I did increase the RAM to 16 Gig, because I didn't think 4 Gig would be adequate for editing music and video.

On Todd's personal front, he already had a 3-D printer; he is now getting into CNC stuff at home. He plans to make some genuine chicken-head knobs for Jimmy Parker, who used to work for us,



**Figure 4 - Not saying this is Alabama, but ... just sayin'.**

and who constantly whined about the lack of chicken heads on his guitars and amplifiers.

At the studios, Todd and Jack have done their usual sterling jobs of putting out the daily fires, and they've pitched in to check on tower sites after particular severe storms. I'm blessed to have them as assistants, and I try to make sure that they know that. I may even buy them lunch. (Maybe.) (We'll see.)

That's about it for this time. Until next month, keep praying for this nation!

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

Last month I went into some detail about our WPWX emergency antenna (and soon to be off-site auxiliary) project. We have finished what we can, and while we have not fully tested it, we are confident that we have a very good and workable facility for this important signal.

There was a lot of work that took place to get this done by our engineering crew. We had to almost completely re-plumb the transmission lines in the building as we took the RF plumbing network from a single patch bay that was connecting two transmitters and two antennas along with a dummy load, to a two-switch network.

The patch bay allowed us to put each transmitter into the dummy load but didn't allow us to switch the transmitters from one antenna to the other. We needed to do this so that we could move our main transmitter, which is frequency agile, to the auxiliary antenna, which was designed to work on both WSRB's 106.3 and WPWX's 92.3 frequencies.

The other challenge was that we had no way in which to add anything to the existing rack at the site and we needed to house a separate audio codec, PPM encoder and audio processor. So we purchased a short rack for that purpose.

Since we needed to mount the two ERI 1-5/8" coax switches and we didn't have a lot of footprint left in the transmitter room, we decided get back to my erector set days and use Unistrut to build a cage over the top of the short rack and mount the coax switches. This worked out well as a space saver.

Earlier in February, we had a break in the weather and were able to line up a tower crew at the same time that we had an ERI engineer in to tune the antenna to the two frequencies as mentioned above.

This went very smoothly as the initial tuning was good and well balanced. I figured that with two frequencies, there would be some kind of tradeoff with respect to VSWR at both frequencies.

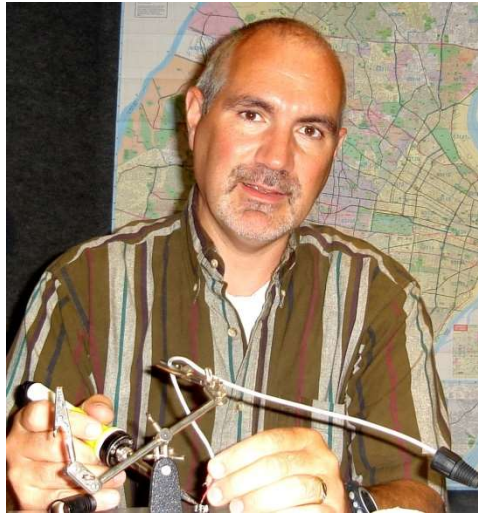
However, the ERI engineer had the tower crew add a second tuning slug to the antenna. The result was a very clean sweep on both frequencies. So it was that we saw virtually no VSWR on either frequency. I was very pleased and we can be confident that the antenna will perform well.

While we are looking at an ERP of 4 kilowatts right now, at some point in the future it may be possible to expand the coverage of the site with a change in transmission line and

higher power transmitter. The antenna that was installed has 3-1/8" bays and power divider so it can handle way more power than we could put into it right now. Of course, that will also be a matter of fitting it into the current contours so that we stay within the station's circle of protection.

For now, we have something ready for emergencies that will cover a good portion of the station's important core neighborhoods. I am anxious to drive the signal when we are able to fully test it. Once we have this auxiliary site licensed, we will light it up and see what we have. My suspicion is that it will actually cover more territory than we hoped for, despite the fact that for now it has much lower power than the main facility and is several miles further south from Chicago.

The one thing I do know is that it will have way better coverage than we would get without it if the tower went down at the main site.





**Valley News**  
**By**  
**Steve Minshall**  
**Chief Engineer, KCBC -- Modesto**

One of the icons of California is palm trees. You expect to see them in landscaping, but not at a transmitter site. I recently discovered three little palm trees growing around the base of one of our three towers at KCBC.

Why three palm trees would start growing around an AM tower is bewildering to me, but there must be some mechanism that makes this happen. My best guess is that somehow birds on the tower have dropped seeds.

How the little palm trees got there is not really important. What is important is to get rid of them before they cause damage to the tower foundation, building, ground system, and underground conduits.

I did some research on how to remove them and kill the roots. Not rocket science,

just cut them and apply some weed killer. I brought a battery powered saw and a battery powered drill, cut the trees off and then drilled holes in the stumps. I

poured herbicide in the holes. After a couple of weeks, they look very dead. Hopefully that is the end of that for a while.

On the NX-50 transmitter, I got a status alarm, "DPLL unlocked." I had no idea what that meant, but the transmitter seemed to be working fine. Nautel had me gather some data from the Exgine system and

responded with the suggestion that I re-calibrate the Exgine TCXO with instructions that they provided. So far, that seems to have taken care of that status alarm. It is always nice to have all green indicators.



**The Portland Report**  
by  
**John White, CBRE**  
Chief Engineer, CBC–Portland

The tower upgrade at the water district location continues to move forward. Unfortunately, the detuning was an afterthought. Due to the lack of notice of start of the work, Cris and I both felt that detuning expertise was needed in order to get the detuning process back on track. The extended tower is 180 feet tall and a much larger cross section as shown in Figure 1 below.

Without notice, discussions that could and should have happened prior to the beginning of construction didn't take place. Fortunately we discovered the construction relatively early and were able to raise the issue. The tower upgrade proponent agreed to call in Hatfield & Dawson to produce a detuning plan. Ben Dawson has expertise at the Water District site which he brings to the table.

One constant battle with towers used for

land mobile applications is the R-56 grounding standard. It's almost rote that R-56 requires all grounds must be connected to the ground halo.

Grounding to the halo creates huge problems for detuning and RF induced on communications coax lines.

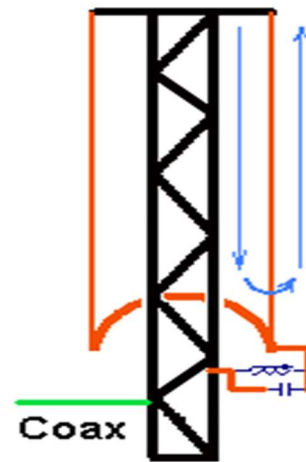
A properly skirted and detuned tower is show in Figure 2. In this configuration, the tower and skirt current (in blue) cancel each other. The coax cables to antennas on the tower attach below the detuning skirt and are isolated from any AM broadcast current induced in the tower.

Any other configuration, including the halo ground, will induce current into the communications coax cables.

At press time, we appear to have a detuning plan in place that will produce the desired result. So far, so good.



**Figure 1 - The new 180-foot Water District tower.**



**Figure 2 - A properly skirted and detuned tower.**

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

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### **Barn Work**

The month started with me dragging my always willing husband to KLZ to do work on the barn. The building had one small incandescent light at the top that just didn't do much of anything to dispel the gloom.

We rented a boom lift and drove it to the site. We had already purchased six four-foot LED lights to hang in there. Of course, no good plan goes without issues.

The first issue we encountered was the control box that was supposed to be on the boom itself was not given to us. Instead of driving back to the Home Depot (a one-hour round trip) and wasting time, Jordon decided to do the work from the boom while I manned the controls below.



**My husband Jordon installing an LED light fixture in the KLZ barn.**

Since there was plenty of time of standing around, I decided to clean the barn, something which has not been done since the Kennedy administration. I brought a broom out and began sweeping the concrete and the inside walls of the barn. I wanted all cobwebs removed along with dirt, mouse poop and anything else that was there. It was quite the project.

I also used the tractor to remove a large stump that had been located at the back door of the barn for years. While it wasn't in the way, it was

ugly, and well, I was bored, so why not use the nice tractor we have to remove it?

It took several hours to get the work done. I am very happy with the brightness of the barn now, and with it being cleaned up inside, it looks amazing!

The next step, on a warmer day, will be for me to use our tractor and remove about four inches of material from the dirt floor, then bring in some recycled asphalt followed by a compactor to get it really looking good in that barn.



**Can't beat a clean, well-lighted space to work on tractor, brush hog and backhoe! Soon we'll have recycled asphalt instead of dirt on the floor.**

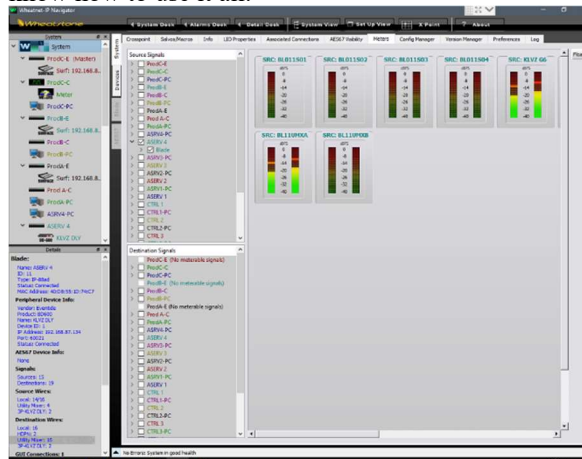
After the barn work, we decided to go ahead and do some work on the trees. I had found the camera on the building couldn't see the barn clearly because of a couple trees that had grown up in the way. We cut them down and move them and then

also did some limbing of the tree that hangs over the road so our cars don't get scraped every time we drive by. All that really made a big difference in the camera view. We can now see the entire barn without having to wonder what is going on behind that area that's covered up.

I do hope March brings some warmer days. Especially since winter finally came to Colorado and refuses to let up. I understand we need the moisture, and I get that it is technically still winter. I also get that we were spoiled with a beautiful January. Even so, I am ready for winter to be over. I want the rain and warmth to come back so that things green up and the outdoor activities I enjoy so much can resume.

## Wheatstone Training

Jay Tyler from Wheatstone was in town doing various site visits and decided that this year, he would do a day of training. It was a small group, which was great. And it was very informative. He brought in Robert Ferguson, who many of you who use their products know, is one of their great tech support guys. He trained us on the new Wheatnet Navigator. They have made some amazing improvements over the program and wanted to let us know how to use it all.



**The meters tab of the new Wheatstone Navigator.**

Some of the things we kind of knew about but with the training we could see it in action and envision ways of using it ourselves. In Denver, we are still a ways off from being able to fully use the new software but, as we upgrade locations over the coming years to be fully Wheatnet-based, we will find more and more ways to better utilize the updated software.

I won't go into detail of all the new features, but one that I am most excited about and know I will use more, is the meter tab. It brings up a list of all

the sources and all the destinations. Instead of having to go search a crosspoint in order to be able to right click and view meter, I can go to this tab and just select what I want to listen to. If I want to make sure my audio server does indeed have audio, I can select the ASERV, and it brings up the meters so I can see what channels have audio. It's a quick way to determine if an off-air issue has something to do with Wheatnet, NexGen or something else, because obviously, if Wheatnet is getting audio, then the issue will most likely be somewhere else. I also have no doubt there will be many more uses for these meters.

## Break-In

I woke up the morning of February 25 at my usual 5:00 AM time. Typically, in the mornings I get up, my phone remains on Do Not Disturb until 5:15, but I will still check it to be sure all is right with the world. I saw that Security Central had called at 4:56AM. I looked at the email I received from the system and saw it said KLZ Zone 2 and 3. That would be the garage door and the back door. Being half asleep, I assumed it was the wind. I knew they were forecasting some extreme wind for that day.

A few minutes later I was upstairs finishing up my morning devotional and it hit me, the email said KLTT, not KLZ! OH NO! Zone 2 and 3 are back door and motion in that back room. This was a legit alarm. I immediately checked the cameras. The front gate looked good. I got on the PTZ and moved it to look at the back door and sure enough I was staring at the deadbolt. Somehow had clearly pried the door open.

I called Security Central and they confirmed they already dispatched police. They relayed my info to the responding sheriff's office and I called my dad. We decided he'd come to me since my house was on the way and we'd carpool to the transmitter site.

Thankfully, the station was on air. That means they didn't take transmission line or anything critical. When we arrived, we had three deputies waiting. They had already gotten the key from the Knox box on the gate and cleared the building.

We went in and could see in the front room a box and packing material on the ground and the storage cabinet doors open. We went to the back and both our cabinets had their doors open. Our extension ladder had been moved and the dehydrator was lying on the floor, damaged but still running.

With the police there, I got on the security DVR but didn't see anything. Of course I felt rushed to find something, but couldn't.

We determined that the only thing stolen was the spare RF contactor that was located in the



box that was now on the floor. A sucky thing to get stolen, but in the grand scheme of things, I will take it.

The deputies gave us the report number so we could contact them if we did find anything else missing or on video. Keith and my dad went to work on the back door. It was destroyed, so they needed to find a way to secure it until we could get someone out to replace it.

My job was to go through the video. One thing I know for sure was the alarm was at 4:56 AM. The deputies kept telling me that these companies wait 15-20 minutes before they call the person on file. I had to explain, not this company! I could see on my app the alarm was at 4:56, and before that minute was up, they had already called me.

We figured out they came in on the south side of the canal at the gate there. Keith found the lock cut. So I had to think a bit, if I were a thieving scumbag, how long would it take for me to pull up, cut a lock, drive in and then cross the frozen canal. It's pitch black out there.

I started the video about 4:40 AM and watched it sped up. At 4:48 AM, I could clearly see someone turn into that drive. Keep in mind, we don't have a camera that actually looks over at that gate. The PTZ can't see it and the one that looks at our front gate can't see it. But I could see the headlights turn in. Out there is just one road, Piccadilly, that runs north/south. The closest east/west road is just to the north of us. These lights turning came from the south. No road over there.

So I went to the PTZ camera and prayed it caught something. It is set to tour. It goes to all four towers and then the gate behind our building. At 4:50, I saw the vehicle and part of the person's face. Of course the IR pictures aren't great and I honestly don't know if the police will be able to do anything with it. But I got the guy! He drove up, looked and then drove up a bit further.

My guess is, this person had planned this. We have a barbed wire fence that goes alongside the canal to try and direct the horses to cross at certain points. There is still quite a bit of water in the canal too, some frozen, some not. So whoever this was knew where to park and walk across without making a mess. What this idiot didn't know was there's nothing to take in our building.

He got away with an RF contactor, and as we later found out, the Dewalt screw stick (without charger) and drill bits. Odd things to take but okay. He left the dehydrator, perhaps it was too heavy, maybe he got spooked, or he just wanted to cause some damage.

I saw on camera when he turned his car on, but since the camera toured, it was just for a few seconds. This made us realize some vulnerabilities with our system. We are looking into getting two more cameras to go with our system to look at the front and back doors, then another camera to look at the gate on the south side of the canal. And maybe a camera or two inside the building so that if someone does get in, they are on camera.

I was also able to get a door company out who temporarily fixed the door. I am still waiting to hear back from them on a new door (keep in mind I am writing this the day after this all occurred). My prayer is they will be able to get things fixed and we can go about our day to day without worry of another break in. Oddly enough, this site was almost broken into back in 2012 I think. I got an early morning call and someone had busted our lockbox off the front door, gotten the key, gone around back and actually ended up breaking the key off in the deadbolt, making it so they could not get in.

Of all the sites to get broken into, I always figured KLZ was the one to have the most chance. The area is not the best. We've had numerous crimes in the townhomes across the street, including a deputy getting killed and a body being found encased in concrete in someone's basement. It seems each month there are a handful of stories that include the area, and they aren't good ones. But for whatever reason, this site has remained free of most crime.

The site that is in a remote area is the target. I understand why it is a good target, but still, it seems like a bit of a drive to do crime. There aren't any bigger neighborhoods for quite a distance from us. Just some houses here and there, and we have gotten to know those neighbors some and I have no doubt it wasn't any of them. Only time will tell if the police are able to figure out who it was and make an arrest.

### Coming Up

I pray that March will be less eventful in the crime department. If it warms up, I plan on doing some of the remaining barn work. I also plan on going over all three sites that we have a camera system at and really think through them. I know any system will have vulnerabilities, but I want to try and make so we have very few.

Something else that I am working on is my FAA Part 107 license. Many of our engineers in various markets got there's so they can fly drones to inspect towers. I never got mine because my dad had his, so why do I need it? Him being back in the hospital late last year made me realize that I need to

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be able to do the work if it is needed. If he is laid up again for any reason, it falls on me.

Not only that, but I have been bugging my husband and a friend to get their Extra Class amateur radio license. Both have General Class but not Extra. I figured if I am going to bug them to do that, I should at least do something like this and quit putting it off. I don't know if I will test in March, but I will at least be studying, and once I feel comfortable with

the material, I'll go see if I can pass the test. I absolutely hate tests and do not do well, never have. So it'll be interesting to see how I do. I figure the more prepared I am, the better the chances. I guess you'll have to wait until the next edition to see if I am still studying or not!

Well, that about covers it for this issue. See ya next time!

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**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/95.3 MHz, 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 MHz, 2.2 kW-D/430 W-N, DA-2*

**WDCX • Rochester, NY**  
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**WDCX-FM • Buffalo, NY**  
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**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*

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*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*

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