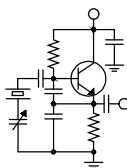


# The Local Oscillator



*The Newsletter of Crawford Broadcasting Company Corporate Engineering*

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## **Fires!**

August was a smoky month here in Denver and all across the west due to the many wildfires burning throughout the drought-stricken region. We dealt with a couple in Southern California, last month, both of which were in the neighborhood of the KBRT Oak Flat tower site. One, the Skyline Fire (which actually burned in late July), came pretty close to our site and kept us out of the site for a few days. The photo above was taken by Todd Stickler from one of the switchbacks leading up to our site. Clearly, the fire burned all the way up the canyon and was stopped by the red line of slurry laid by firefighting aircraft.



Then in early August, the Holy fire, named after "Holy Jim Canyon" where it started, burned 22,000 acres in the Santa Ana Mountains just south of the KBRT tower site. That fire was reportedly started deliberately by a man in a dispute with a neighbor (he was arrested and charged with arson). Firefighters dropped slurry on the Santiago Peak tower site to protect it, and that site was unharmed. Santiago Canyon is a couple of peaks and a few miles south of our site, but it's in the same range.

Our heartfelt thanks to all the firefighters, on the ground and in the air, that battled these fires to containment!

In both cases, our site sailed right through. We never lost power (which is always my biggest concern – above-ground electric infrastructure is always at risk), and we had a full tank of diesel for our generator, but that would only carry us a few

days. If closures would keep us out for an extended period, we could be in trouble. Thankfully it didn't come to that – the lights stayed on. Our own electric feed is all underground, but upstream a few miles it is overhead, and we know from previous fires that it is at risk.

I mentioned the smoke in Denver because we have had a lot. Sometimes visibility has been down to just a few miles. The mountains to the west were completely obscured, and outside it smelled like a campfire. Some people had respiratory problems as a result, and nearly everyone was experiencing stinging eyes. While some of this smoke was coming from in-state fires, most of it was from California – the local TV weather people would show us the smoke maps and satellite imagery depicting how the smoke plumes were being carried into this area from the west coast fires. At this writing, we still have a little smoke and haze in the air, but it's so much better than it was... and no campfire smell or stinging eyes, thank God!

## **Birmingham Challenges**

We had some difficulties in Birmingham last month, and Stephen Poole will address these in his column below.

One issue was with the main transmitter at 50 kW WXJC(AM). On a morning following some thunderstorms in the area, the transmitter would not come up (we operate on a separate 1 kW transmitter at night). There were a lot of alarms and indications,

but these didn't make any sense, which led us to look at the power supply.



**Tower workers installing new trunking system antennas for the City of Birmingham.**

I had the XL-60 manual and schematics out on my desk while Stephen and his crew were at the site, also poring over schematics and making a lot of measurements. The conclusion, after much troubleshooting, was that K2, which is the main 480-volt primary contactor that bypasses the step-start resistors and applies primary power to the transmitter, was not pulling all the way in, and the issue was mechanical, a broken piece of plastic inside the contactor. We experienced the same failure in the Albany XL-60 a few years ago. Because Nautel did not have stock on this item and the manufacturer (Siemens) had discontinued it, we had to go to “plan B” and source another contactor that had the same or higher ratings and that would fit in the space. Stephen found one at Allied Electronics in Ft. Worth and I ordered it.

With the replacement contactor in hand, Stephen and his crew installed it, which fixed the main problem but revealed that it was not the only problem. Stephen quickly figured it out and got the main transmitter back on the air.

The pressures of fixing a failed transmitter aside, it was a fun exercise for me, tracing the circuitry out in the schematics and sending Stephen to various points to make measurements and checks. He could have easily done it on his own, but more than one set of eyes almost always helps things along. I was glad to be able to participate, even in a very limited way.

**Drone Missions**

Our Remote Pilots have flown several drone missions over the past month or so. First, in Detroit, we were contemplating moving the WRDT translator northeast to tower #2 in the WCHB(AM) directional array. This is a 185-foot guyed tower that we own, but it is located at an Entercom tower site. We didn't

really know anything about this tower other than its location and general dimensions. To determine if the tower would safely support the translator antenna, we would need to run a structural analysis, and for that, we would need a lot of measurements. Instead of sending a tower worked up with a caliper and notebook, Brian Kerkan sent the drone up instead.

We had the drone slowly fly up one tower face, and we stopped to take some high-resolution still photos of items of interest along the way. Brian made some measurements on the bottom tower section, and I was able to use these to scale the high-resolution videos and photos and determine dimensions at various elevations.



**From these face-on high-resolution photos, we were able to scale member size and spacing for the structural model.**

When all was said and done, I made a scale mechanical drawing of the tower sections and sent that along with dimensions and the drone videos/photos to the structural engineer. He was then able to construct an accurate model and run the structural analysis. The good news: no problem – the tower can easily support the translator antenna load.

Then in Chicago, we had a problem with one of the night red lights on the Lansing (WSRB) tower. That tower has a dual medium-intensity white (day) and red (night) lighting system, and we were getting an alarm on one of the red beacons that appeared to be lit (from the ground).

The drone allowed us to look at the beacon close up while it was on and see that one of the lamps was out. It also confirmed for us that the beacon uses incandescent lamps – we weren't sure whether they were incandescent or LED. We then got the correct replacement lamp and sent up a climber to completely relamp the tower. Rick Sewell flew the drone during the relamping to keep an eye on things.

Rick also flew another mission, this one at our Hammond tower to get a look at the microwave antennas there. We're looking at replacing/upgrading our microwave equipment for 2019 and I needed to

see what the 18 GHz antennas on that tower were. The drone allowed us to do that in a hurry without the trouble and of expense of sending up a climber.

Todd Dixon flew a drone mission to keep a watch on a tower crew working for the City of Birmingham, changing out the city's trunking system antennas on our Red Mountain tower. This video let

us see the quality of the work, and of course we shared it with our tenant, who was paying for the work. That project will take some time to complete and will include the installation of several microwave dishes on the tower in addition to the fiberglass 900 MHz trunking system antennas. We will continue to use our drone to watch the progress.

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**The Motown Update**  
by  
**Brian Kerkan, CBTE, CBNT**  
Chief Engineer, CBC – Detroit

Greetings from Motown! What a really hot and muggy month August was in Detroit. We had a lot of rain-free days and used them to get the field mowed at WMUZ(AM) around the 10-tower array.

We also took some time to take care of maintenance on the John Deere tractor we acquired with the purchase of the station. It went in for a complete service before the sale was complete, but things did not look quite right.

After checking the oil, it was apparent that it was dirty and needed changing. The dealer that provided the service was one that the previous owner had used, and if they did any service at all, it was minimal. We changed the oil and battery and made sure that the tractor was ready for the field.

It will be coming up on a year that we have had the new Nautel NX50 transmitter on the air at WMUZ(AM). The site has been pretty much trouble free. Our Part 101 microwave link has also been reliable, and fortunately we haven't needed to use our backup T1.

We had an issue with one of our production room power supplies going into fault requiring a power cycle. Apparently, it is a known issue with some of the earlier Wheatstone PSE-1 power supplies. I have been told that there is a modification to prevent this from happening, and the change must be performed at the factory. We sent the supply back to be serviced.

I am working on a project to integrate security cameras and a custom Autopilot screen for station silence sense monitoring and general transmitter readings for all stations on one easy-to-

read screen.

We have updated all our EAS units to the latest version with the si-rev5 certificate update on the ENDEC. We are prepared for the upcoming national EAS test on the 22<sup>nd</sup> of this month.

The warmer weather increased power usage and created a small issue at one of my sites. The power is usually around 120 volts, but dropped to 107 volts, causing a brown-out issue with the reference voltage being outside the usual window and causing a lockup. We were able to stay on the air, but it's good to be prepared when stuff

like that happens. In this case, we are a tenant and receive power from the site generator, which we don't maintain.

August was a sad month in Detroit with the loss of Aretha Franklin. She was a close friend of Reverend Mother, one of the hosts on WCHB. Not only was she a music legend, she did so much for the community. She would regularly host events at her church for the public. This city is so rich with music history. There will only be one Aretha, and she will be missed.

We have converted the studio end of our Part 101 microwave link over to use a tower base mounted UPS 48-volt DC supply. The UPS is built into a NEMA box, and we converted the AC wiring on the tower to feed DC up to the tower-mounted radio. I used a 48-to-24 volt converter at the top of the tower near the dishes to feed the Ubiquity dish with 24-volt POE power. It has been in service a few weeks and has been rock solid.





It wouldn't be summer in the Motor City without a Car Cruise, and WMUZ was out and broadcasting live for a few of them. Our iPad setup with the Tieline Report-IT app has worked out great. It is a simple enough setup for talent to take out with them, and provides excellent quality. We have been using the Shure MVi as our audio interface. The MVi really sounds nice with our remote microphones. We put together a complete kit that includes everything they need in the field.

We recently had our generator serviced and found out that our battery charger was failing. This was caught during the PM. It is so important to have service done on a regular basis. If you don't have low battery voltage indication wired to your remote control, the only time you might catch this is when the generator doesn't start when you need it most. It seems brief power outages are increasing in our area. Our generator is a critical part of our infrastructure. There was a time recently that we were on generator



**48-VDC UPS mounted on a tower leg at WMUZ.**

power for three days. It is in such times that a generator can save you.

I look forward to fall, and until next month... '73 from Brian W8FP.

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

We can only hope that Cris doesn't pass out from shock. I'm actually submitting my *Local Oscillator* column early. Sandy and I are headed to North Carolina to see family and friends the last week of August.

#### **Servers and Plugins**

I joked on Facebook a few weeks ago that if I'd known that my job would one day require learning so much about Apache, MySQL and PHP, I'd probably have taken up truck driving. That really was a joke, because the truth is, I love working with IT. But what spurred that little drop of humor was one of our websites.

Someone wanted to install a new plugin for WordPress that just wouldn't work. Blank screen, no errors in the logs. Keith Peterson and I tried to repair it. We increased allocated memory, we installed a new version of PHP, and made a bunch of other changes. It never would work.

My experience with WordPress has reminded me of working with MS-DOS back in the day. Once you got past the basic keyboard and mouse, and started adding printers, network cards and

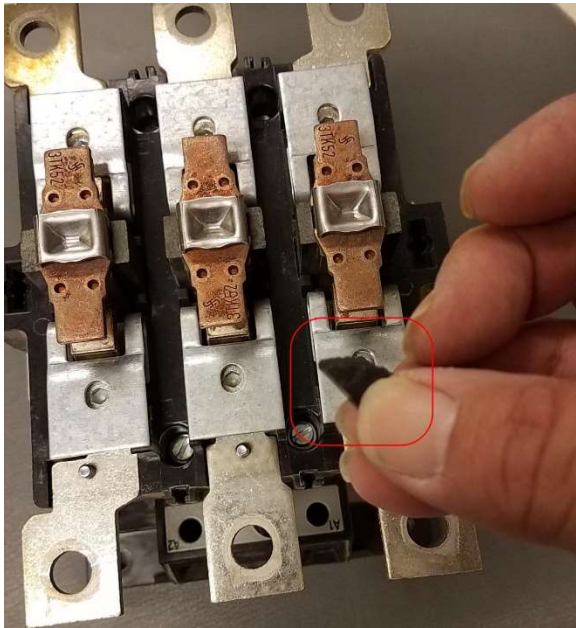
other stuff, you had to install device drivers. Then you'd add a line like, "device=[driver name]" at the top of the old CONFIG.SYS file. The hilarity ensued

when two drivers would conflict, and if you called the vendor, they'd typically say, "you need to load our driver first. Put our 'DEVICE=' line at the top." If that didn't work, you'd be told that you could either use one or other driver. Pick one. Sorry.

Now that's troubleshooting, folks. Look: I realize that there's no comparison between MS-DOS and a modern server with a LAMP stack running WordPress. That's just how my weird brain

works. But it's hard not to go down memory lane when the support team for a WordPress plugin says, "Disable all other plugins one at a time and see which one is killing ours." Keith has told me of his joys with this, both on our server and on his "dev" setup at home. Sometimes the conflicts don't make a lick of sense; the two plugins supposedly do entirely different things. But when a conflict arises, sometimes you have to choose between the two: do I want a better editor, or better spam control? C'ain't





**Figure 1 - A little piece of plastic whispered in my ear ...**

have both.

A large hosting provider with hundreds of WordPress websites will have a dedicated staff and extra servers on which to test. We don't have that. We do have a spare (in fact, it's the old webserver machine), but that's not quite the same. We have to be very conservative, because a minor change made for one website might kill 17 others. That would be an unhappy event.

We now have a little handout that we'll provide to anyone who will be maintaining a website on our server. It lists our installed software versions and asks that the site's maintainer contact us before trying a new plugin. If it should require all sorts of changes to our basic software setup, we may have no choice but to say, "Sorry." Better to ask us up front.

Now back to that joke thing. Apparently, WXJC, AM 850 in Tarrant, didn't realize that I was joking and decided to stress-test us in mid-August.

### **WXJC's XL-60**

Our Nautel XL-60 has been a very good transmitter. In fact, it has been the best high-powered AM unit that I've ever maintained. Through thick and thin, through storms and fair weather, power failures, lightning strikes and break-ins, that big monster has just plowed along happily, cranking out 50 kW at full modulation year after year.

Oh, we've had a couple of issues since we installed it in 1999. Not long after we bought it, one

of the RF modules gave an alarm light. That was a defective component that had made it past quality control. Quickly fixed, quickly restored to service. Several years ago, a fuse holder on the RF driver supplies arced and melted. We were off the big transmitter for a few hours while I replaced the holders. But aside from that, our XL-60 has been pretty much trouble free.

One Tuesday morning in August, though, we got The Call™. 850 wouldn't go to high power. Todd beat me to the site and texted, "Bunch of alarms on the front panel." When I arrived, I noted that we had the undervoltage, AC fail and temperature alarms. We began troubleshooting. I figured it was just a blown fuse or something like that; we'd had the usual Alabama storms the night before. But all the fuses checked good.

After several hours of poking and prodding, I called Nautel Support. They suspected the big rectifiers, which was bad news. My meter said they were good, but Nautel said to check them. I had to rearrange things and set it up so that they could be powered up under a load. That took a while, but at length, I finally ruled those out. The next suspect was the main transformer, which would have been even worse news. If that thing had needed replacement, we would be looking at weeks of downtime and several thousand dollars. But thank the Lord, after a good bit of testing, we ruled that out. Transformer and rectifiers were good.

Nautel Support also said that we should try it with all modules pulled. Todd, Jack and I had a lot of fun yanking those heavy things. When we powered up for a test, though, we were still getting the alarms. I tried lifting the fuses to the power modules, given that the big capacitors are still in circuit with the modules pulled. Still no joy.

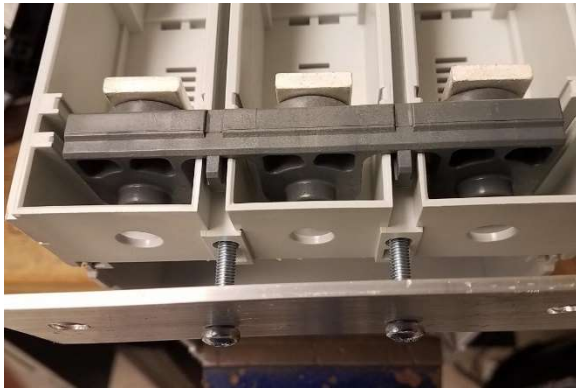
But finally, we discovered that the main AC contactor wasn't pulling all the way in. The XL-60 has what we Old Timers call "soft start." A small contactor charges up the supply through some resistors to limit current inrush. Once the supply voltage reaches a predetermined level, the main contactor kicks in, bypassing those "startup" resistors and bearing the load for normal operation. Nautel also has monitoring circuits that keep an eye on temperatures and voltage levels; hold that thought.

### **Problem One: Bad Contactor**

The main contactor was fooling us because it appeared to pull in. When I forced it on, I even heard a "clack." There were no signs of burning or overheating, and it's a royal pain to disconnect the thing to check the contacts, so we moved elsewhere

again. This was a mistake. At length, we determined that the main contactor wasn't pulling all the way in. We removed it (which took more time), then disassembled it. A little piece of plastic fell out into my hand (Figure 1).

Ah. Hah, hah. How nice. This is an older Siemens contactor, no longer available (and more thoughts on this later, by the way). First, we needed a substitute that would work, and which was roughly the same size. Second, we had to find one in stock somewhere. After some research and comparing specs, I settled on the ABB AB265-30-11-13. It could actually handle more current but was about 1-1/2" taller. Some careful eyeballing and measuring confirmed that it would fit.



**Figure 3 - Jack thinks he's good. The holes matched right up.**

Newark showed stock, but only at their UK warehouse. Best case, it would take several days to ship that contactor across the Atlantic. A bit of Googling later, I saw that Allied in Ft. Worth, Texas had two in stock. Cris ordered it for us (thank you, sir!) and we received it the next day.

Jack built some nice aluminum adapter plates for us. Since the replacement was taller, we would have to install the plates on the wall of the transmitter first, then secure the new contactor to the plates with long bolts that were pre-installed on the plates. Jack is well on his way to becoming a Real Engineer™: he built the adapter plates in our shop before the contactor arrived ... and the holes matched *perfectly*. The threads didn't even rub (Figure 2).

Todd added the long bolts and did most of the work of fitting the new contactor into the transmitter. (Don't tell him, but I was happy to let him honk those thick cables into place. Heh.) Finally, it was in, so we applied 480V AC ... and still had alarms. Now we could hear a definite "snatch" and "clank" as the charge-up and full power contactors kicked in, but no go. The contactors would drop right

back out with alarms on the front panel. Needless to say, we were disheartened. It was time to start poring over the schematics again.



**Figure 2 - Todd did the mounting. You can see Jack's plates in the back.**

### Problem Two: A Shorted Transistor

Following the schematic, we tried lifting the main chokes, L1 and L2. One time we got no alarms (except for undervoltage, of course); the next time, we did. It was making no sense. I had talked with Ryan at Nautel and he had warned me that this older transmitter "piggy backs" some alarms on top of others. In particular, if for *any reason* the transmitter was unable to make full B+, we could get a "temperature" alarm. It might not actually be an over temperature problem.

The "AC Fail" alarm samples the 43VAC that feeds the fan and RF driver supplies. If it's too low, the controller cancels the start-up sequence and turns on that front panel indicator. The "Undervoltage" alarm is a simple pair of comparators that look for 300VDC, plus or minus 10-20%. Assuming you've tapped the transformers correctly, either alarm could mean excessive current draw during the "soft start" period.

I came back to the chokes and the fact that on different tries, we were getting different alarms. These inductors have what Nautel calls a "Choke Strap" (A56 and A57 in the XL-60) that pull samples off for the monitoring circuits. But there's another line that discharges the power supply capacitors when

power is removed. This a good idea; those capacitors will store more juice than Tropicana.

When the AC supply to the transmitter is removed, of course both contactors will immediately drop out. An auxiliary contact on the “charge up” relay then drains the B+ to ground through two big 50-ohm resistors. But there’s also an IGBT on the Power Supply Control Board that can clamp those resistors to ground. You can’t imagine how happy I was when I disconnected that transistor and discovered that it was a three-way piece of wire: emitter to gate, gate to collector and emitter to collector, all dead shorted.

I left that discharge wire loose and applied 480V. Green panel! I pushed the Big Red Button and on she came. Thank you, Lord! Back on air at full power. But Tarrant wasn’t quite done with me: I glanced at the antenna monitor and saw all sorts of crazy readings. The relative ratios between the other towers were correct, and we had no reflected power, so I figured that we had lost the sample loop on tower #5 (the reference) again. We’ll have to call in a tower crew (again). It’s always something.

### **Speaking of Parts**

Even if you just glanced over the rest of this (I know I can be long-winded), you need to read this part. I mentioned that the XL-60’s original Siemens contactor is no longer available. Some of the little DIP relays inside the Nautel (which Support had suggested as something else to check) are becoming hard to get nowadays. When I did a web search for

the little orange Aromat DIPs, for example, all I got were hits for old, surplus parts on eBay and Amazon. Panasonic (which owns Aromat) says that the part is obsolete, and the recommended replacement has a different pinout(!). We’ll need an adapter.

Parts becoming obsolescent isn’t a new problem. I’m old enough to remember when Sylvania, RCA and other US companies stopped making tubes. If you had a really old transmitter that required odd tube types, you were out of luck unless you could afford to replace it. As a guitar player, I started experimenting with solid-state circuits that would sound good in the late 70s as well.

But the problem has become worse, and it’s not going to get any better. Some IC types are no longer available, and the recommended replacements may not even come in standard DIP packages. Some new components are only available as Surface Mount Devices (SMDs). You can find adapter boards that will let you use them: you solder the little SMD onto the board, then plug it into the DIP socket. However, some of these tiny devices have a metal contact on the back that must be soldered to a ground plane. It not only provides ground for the chip, it also acts as a heat sink. You’ll need solder paste and a temp-controlled oven for this. You ain’t gonna do it with a soldering iron.

I’ll be working on that as I get time ... starting as soon as I get back from NC, anyway. Until next time, keep praying for this nation!



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

### Lightning Never Strikes Twice

Whoever said lightning never strikes the same place twice probably never worked in broadcast engineering. We all know that it can and most likely will. In fact, I have proof that it does within a three-month period. Back in May, we had a lightning strike at our Kirkland, Illinois, transmitter site.

In this particular event we ended up going off air at about 9 pm. I got in my car and drove for two hours only to find the main breaker on the breaker panel tripped. The only other breaker tripped from this event was the one for tower lights. Additionally, there were several MOVs burnt out in the Nautel surge protection box.

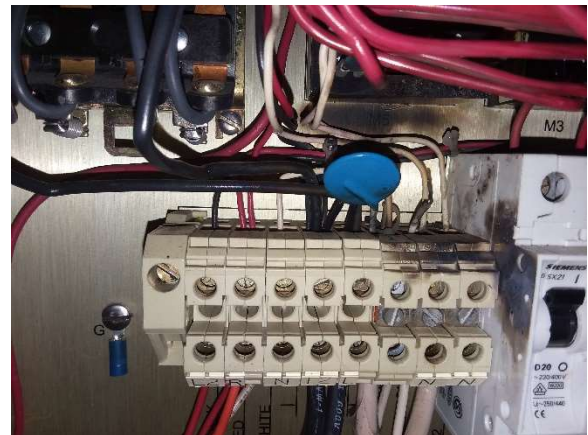
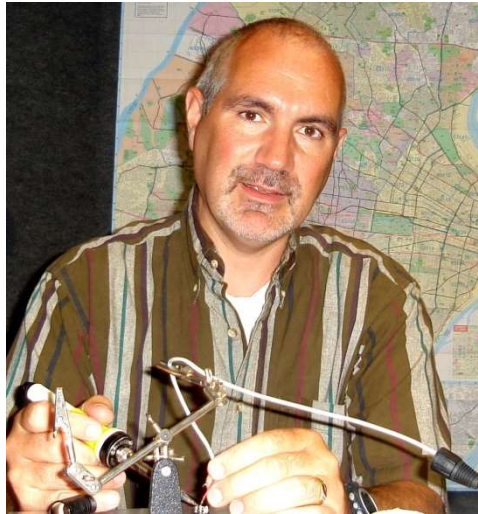
Upon further inspection, I found that one of the mid-level beacons was not flashing. When I opened the tower light control box I found that one of the MOVs across one of the 240-volt legs was completely vaporized. There was a lot of carbon scoring around the adjacent parts. I had to replace an auxiliary beacon flasher to get the beacon to begin flashing again.

Now earlier this month, I got notification that there was an issue with the mid-level beacons again on this same tower. This was right after several thunderstorms had gone through the area. The man responsible for cutting the grass in the antenna field lives nearby, and I asked him to drive by and check out the lights. He told me both mid-level beacons were totally off.

The next day I drove out to the site and found that there was some definite damage to the wiring in the tower lighting control box. These were the wires affecting the mid-level beacons attached to a transformer. The transformer wasn't damaged. Once I replaced the melted wiring, the mid-level beacons were back on, but again,

one of the units was not flashing. This meant I had to replace another auxiliary flasher module. Once this was done, we were back to normal operation.

While I can't say that the lighting hit the *exact* same spot on the tower twice, it had to be close, since both times the mid-level beacons were affected most. The proof is in the photos.





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

As we approach press time, the saga of the wayward wireless tower continues. On the American Tower Corporation #8110 tower, a 7-bay FM antenna was removed without any notification or effort to maintain the detuning of the tower. The initial detuning adjustment attempt of the shortened tower revealed problems with the detuning apparatus.

In previous adjustments of the network, it was observed that the detuning was less effective than expected. Once the detuning apparatus was updated, we observed that the detuning was completely ineffective. Basically, the adjustment caused an increase in reradiation. To explain the cause of the defective detuning, a short review is in order.

For shorter towers of less than a half wavelength, the tower will intercept the energy from an AM station. The incident field will induce an RF current that flows from the tower into ground. This current in the tower produces the interfering reradiation. It's basically a mirror image of the way the transmitting tower operates at the AM broadcast station.

Figure 1 shows a typical tower detuning arrangement. A skirt of two or more drape wires is placed around the tower and terminates into a commoning ring at the bottom of the skirt. In Figure 1, T (green), is the current induced in the tower. In the skirt, the current S (green) will cancel out current T when the skirt current is equal and 180 degrees out of phase with each other. The detuning apparatus, typically a parallel LC network, adjusts skirt current phase. As currents T and S cancel each other, the ground current G is reduced to a small value and the tower is detuned.

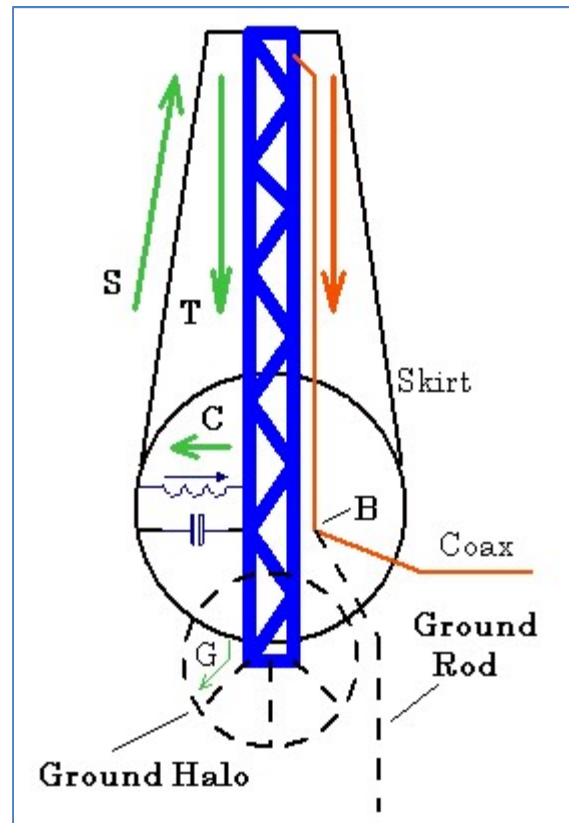
During the adjustment, we observed at best a small reduction in re-radiation.

Tower grounding has an enormous impact on the re-radiation of a tower. The Motorola R-56 grounding standard is the principal standard in the land mobile industry. This standard requires that transmission line coax be "grounded" at point B, the

point where transmission lines leave the tower. That ground is to a bus that is connected directly to the ground halo. Although there is some disagreement, most of the land mobile industry assumes that the bus must be isolated from the tower.

Looking again at Figure 1, RF current is also induced in the jackets of the transmission lines. Detuning requirements would require that this current be returned to the tower at point B. Tower RF current (green) and transmission line current (red) would then sum at point B and be canceled by the skirt current.

If tower and transmission line currents are



**Figure 1 - Tower Detuning**

isolated at point B, the detuning canceling current is less effective. The tower and transmission line summation takes place in the ground system, which is outside the detuning system.

If the ground system is robust and the ground system has minimum loss, the discrepancy may not be excessive. However, at the 8110 tower,

the tower halo and the coax ground appear to be isolated from each other. As a result, the detuning is ineffective.

Ultimately, this conflict between tower detuning and the R-56 standard needs to be resolved in an updated R-56 standard.

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

August is always a good month personally. I start the month with a weeklong vacation and end the month celebrating my wedding anniversary.

This year's vacation was truly amazing. The weather was near perfect every day. The fishing was pretty darn good, and the trails were good and dusty. We were able to spend lots of time off-roading in our truck, ATVing, fishing and just hanging out. This is the fifth year we have had an extended stay. In years past we have only done a Saturday through Thursday trip, which always seemed too short. Five years ago, Jordon and I moved it to be a full week, Saturday to Saturday. This is just about right for time. It gives us time to do everything we want and not feel rushed. It's also long enough that I really miss my kitty cats and can't wait to get home. It's always sad leaving, but I also look forward to coming back to work and getting back into a routine.

### **Phones**

On my first day of vacation, I got back into cell service to several texts about the Denver phone system being down at the office. I don't typically have the circuit info with me, and the equipment is all fairly new, so I am not familiar with it all. Once they told me the studios and the office phones were all down, I knew it was a CenturyLink problem. I ended up having to call Steve Solton, our rock star phone guy, to have him call CenturyLink and deal with the

outage, since he had our info (and could get into our phone system remotely). That cost us some money, so I now have a document saved to my computer

with the info needed for when I call CenturyLink for future problems. Thankfully, once this was solved later Saturday evening, I was able to get back to vacation and didn't hear back from work the rest of the trip.

### **Inventory**

Since coming back from vacation, things have been fairly

slow. Inventory time is here, so that is taking up some time, but it has gone smoothly, and a few days in and I'm nearly done already. I've been trying to be good about keeping track when we take something out of service or move it, to let Elizabeth know so she can update it in the master list. That makes things a lot easier at inventory time.

### **Upcoming**

We will be getting the carpet replaced in the studios the second week in September. While this will be an inconvenience for employees, it is much needed, and I have no doubt people will be happy with how things look once done. The current carpet is left over from the prior tenant – it was in good shape when we moved in to the space back in 2010. But it has had traffic on a daily basis and is worn down so much in some places you can't even tell what the pattern is. We will be getting carpet tile done since we cannot just unplug everything and



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move all the equipment and cabinets out of the room. We will move the smaller furniture out, but the cabinets will remain.

Sometime in October, we will be fixing a fence at the KLZ transmitter site. Back when we had one of the first big winds of the season, it actually blew one side of the fence over. It is a 1962-vintage chain link fence, which tells you just how strong the

wind was. The fence didn't fall down, it just blew over. Four of the line posts are broken in the ground so while the tower is still secured by the corner posts, the issue still needs to be dealt with. It will be a pain to do because of how heavy the fence is.

That about covers it for this edition. So until next time... that's all folks!!!



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The Local Oscillator  
September 2018

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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**  
*990 kHz, 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, 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*

**WYDE-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*

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



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