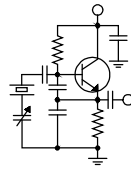


# The Local Oscillator



*The Newsletter of Crawford Broadcasting Company Corporate Engineering*

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## Microwaves

And just like that, summer is over. I'm still waiting for it to begin! Still, we got a lot done over the past three months, and the fall months tend to be some of the best weather months of the year, so there is still time to wrap up some additional fair-weather projects.

One of the budgeted projects for this year was replacement/upgrade of many of our Part 101 microwave links with new Cambium equipment. The reason for this is that the older Trango Apex and Apex Plus radios are now orphaned – Trango Systems went out of business last year and there is no support for these units.

The good news is that the Trango name has reemerged as Trango Networks as a new entity, and the new company has the rights to the last generation of equipment manufactured by the old company, the Apex Orion and Apex Lynx. It is manufacturing and selling these units and offers some limited support as well. In Detroit last month, we had to send in an Apex Lynx that had “bricked” and the new company did a flat-rate board replacement. It wasn't cheap, but it was a lot less than a whole unit replacement.

Still, we have a good number of the older (circa 2010-2015) Apex and Apex Plus radios that are orphaned. When they fail, they're done, so we need to replace them with something that has some support. We initially looked at Aviat equipment, and we may still consider Aviat for some specific

situations, but Cambium, which used to be Motorola, has a bigger installed base and a longer history.

So why haven't I pulled the trigger on this project yet? The short answer is that I'm not sure that the Cambium radios can be adapted to our existing Trango and Radio Waves antennas. I suspect that the Trango-branded antennas are actually Andrew



antennas. Cambium makes an adaptor plate, and our friends at 3dB Networks, our vendor of choice for Part 101 equipment, have ordered one for us to try. We have easy walk-up rooftop access to a couple of the Apex antennas in Denver, so it would be pretty easy to pull the Trango radio off the antenna and see if the adaptor plate will fit. If it will, we're golden; I can start the PCNs and get the

equipment ordered.

If the adaptor plates won't fit, then we will have to make an antenna change, and that's a big project. Not only will we have the added expense of new antennas, most of which are 3-foot dishes, but we will also have the tower work to swap them out and align the paths. That will require us to punt this project into 2020, as we don't have budget for the antenna replacement, and we don't have time to get it done before the snow flies. If we have a failure and absolutely had to make a move, we would deal with it, but the routine, planned replacement would have to wait.

Hopefully I will have the answer by this time next month, and the PCNs for the equipment change will be in process. We can swap out the

equipment as soon as the PCNs are complete and the FCC apps are on file.

### ENDEC Update

At some point this month, Sage will release a major and mandatory software update for its 3644 Digital ENDEC EAS units. As I understand it, the primary reason is security related – FEMA is changing the way that equipment in the field connects to its IPAWS servers. The new release will accommodate that change and disable the old connection method. In short, any ENDECs that don't do the update will no longer be able to receive CAP messages from IPAWS.

The difference between this and other updates, such as the 89-34 update that we just did, is that we have to purchase this update from Sage for \$349. A lot of broadcasters are upset about this cost, for which they really get nothing, but I get it. Sage sold most of the Digital ENDEC units now in the field in 2008 and just a trickle of additional units since then. And yet they have to provide support and a continuous stream of updates, all of which have significant costs in terms of salaries and overhead. There's no way they can continue to do this indefinitely without someone paying the bill.

Now some would argue that the federal government should pick up the tab, using phrases such as "unfunded mandate," and I get that. But the reality is that EAS is part of the cost of holding and profiting from a license to broadcast over the public airways, and it really doesn't cost all that much. Looking at the big picture, most broadcasters paid somewhere around \$2,500 in 2008 to upgrade to the CAP-capable ENDEC. So that works out to about \$227 a year. If another major update isn't required for another eleven years, the per-year cost comes down to under \$130 a year. I don't see that we have any room to complain.

So... we'll be watching for the announcement and I'll email instructions for the update, which I will order and pay for. Stay tuned...

### Detroit

Our new Detroit market chief engineer, John Rempillo, is still feeling his way into the job and our five locations in that market. Last month he faced some real challenges right out of the gate.

The Trango microwave link from the Radio Place studios to the Romulus WMUZ(AM) 50 kW

transmitter site failed. That failure wasn't immediately evident, as the Omnia.9 auto-switched to the backup audio feed, which is delivered over a codec pair over an internet T1. It wasn't until the T1 failed – for about the fourth or fifth time in the last month – that we discovered the microwave link failure.

We should have been able to pull the spare Trango Apex Lynx low-side radio off the shelf and send it up the tower, but the spare itself was "bricked" – it would power up, but it obviously wasn't booting and we could not communicate with it. To add to the aggravation, both our spare Trango 48-volt power supplies were dead as well, evidently having failed at some point in the past and not being fixed.

As noted above, Trango Networks does support Apex Lynx radios, so we were able to send our spare in for a flat-rate repair. We got it back in just a few days, John configured it, and then we had to wait on a tower crew to swap it out and get the WMUZ(AM) site connected again.

Then a few days later, WCHB(AM) dropped off the air. The issue was a failed air conditioner at the transmitter site that probably contributed to a frozen Tieline Bridge-IT XTRA codec. John was able to get the codec rebooted and reconnected, and an A/C tech came out and got the air conditioner working again.

The big challenge for John has been the lack of documentation for the studio and transmitter networks. Those paper lists have gotten misplaced, and we have as yet been unable to locate the correct spreadsheet files on the engineering computer. We did find an old list with some glaring omissions, so we have some information but not much.

I sent Rick Sewell over from Chicago for a few days in late August, and he worked with John to help him figure out some of this, especially at the WCHB site. Rick was also able to train John in the way we do things at Crawford Broadcasting. I know the visit was of great benefit, and John was grateful.

Thanks to any of you that have provided assistance and support (or even just an encouraging word) to John over the past month. That means a lot to a really great engineer who was parachute dropped into a difficult situation. We very much look forward to seeing John continue to learn our infrastructure and equipment and get really comfortable with the facilities.

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

Hello to all from Western New York!  
August is finally winding down, and what a busy month it has been!

In last month's report, I outlined the issues I was encountering in getting our PSD data back up and running after a computer failure some time ago. I ran into several obstacles with the latest version of the TRE software, which was quite different from the previous version we were running. After many hours of trial and error, I was finally able to get NexGen and TRE to play nicely together.

The major difference between versions was in the type of files being exported from NexGen. Previously, we were sending .txt files to the encoder, but the newer version of the software wanted to see the exported data in .xml format. The PSD data is now working well.

However, I am still working on getting the data to the transmitter. We employ a Moseley LANLink 900 to get TCP and serial data to the transmitter site, some 25 miles away from the studios. I was unable to ping the far end of the LANLink from either end, and I was getting a 70% failure rate of the data being sent/received.

Thinking it was an issue with our equipment, I installed a new set we had in Rochester, and experienced the same results. If I increased the injection level of the LANLink, we would get severe interference in the main channel audio, so clearly this was not going to work.

My only other alternative was to create a VPN tunnel using the internet to get the data to the importer, exporter and RDS units. I have a Cisco router at the studio site that can be configured for VPN tunneling, but had to order another switch for the transmitter end to complete the tunnel. Hopefully by the time this goes to press, I will finally have this

back up and running!

In Rochester, at the WDCX(AM) transmitter site, tower service contractor Don Boye was finally able to come back and complete the tower light repairs he started late last month. Tower 4's beacon

was completely out, and tower 2 had one beacon lamp out, which failed only hours after the initial installation. H & H Lighting made good on the defective bulb, which was the first failure I have ever seen since switching to that brand several years ago. This 6-tower arrays lighting is now in great shape, as Don has completed installing all of the side lamps with Dialite LED lamps.

While on the subject of Rochester, we had three separate instances of commercial power loss this past month, one each at the WLJZ transmitter site, the WDCX(AM) transmitter site and the studios. In each instance, there was no bad weather in the area to cause the outages. I assume that the issue was a high electrical demand due to the warmer temperatures we had the past several weeks, causing either a brown-out or total failure from the distribution point.

About this time last year, I had our general contractor, Skyline Contracting come out to the WDCX(AM) transmitter site to look at the foundation damage we have on all six doghouses and give us a quote to repair the damage. The issue is the cinder-block foundation is crumbling due to improper drainage, and in the winter months, water would run under the foundation and freeze, causing the cinder-blocks to break.

I had Andy come back last month and inspect all six buildings to ensure that the quote he gave last year would still be good. As luck would have it, he found additional damage at towers 1 and 2 that occurred this past winter, increasing repair costs



by several thousand dollars. Skyline Contracting has scheduled this work to be done in the first two weeks of this month, weather permitting.

Andy explained that in order to keep this from occurring again, they will have to dig down to the frost line all around the buildings and create a form and fill the foundation and base portion of the walls with structural grade reinforced concrete. They will also use fill dirt all around the buildings, which will increase the pitch of the ground and allow water to drain away from the foundations. The only other work that will be needed are minor roof repairs of the main transmitter building which will be budgeted for next year.

Several months ago, Cris purchased a “like new” Nautel ND-5 that was the backup transmitter at WDCD in Albany, NY. I traveled to Albany back in April to pick up the transmitter and brought it back to Buffalo to perform the frequency change from 1540 to 990. We have been waiting months for the parts to be delivered from Nautel so I can perform the frequency change. I understand the holdup was in

obtaining the crystal; most all of the other parts were off the shelf items. The kit finally arrived last month, so soon I will undertake this task. This will be the first Nautel I have performed a frequency change on, and I am looking forward to getting started. I have done numerous Continental and BE transmitters, although I did convert our present main transmitter (Nautel ND-5) to HD almost 10 years ago, so I do have some experience as many of the procedures are identical.

Last month, I reported issues we were experiencing with our Tieline Bridge-IT and Bridge-IT XTRAs in Buffalo and Rochester. The units were dropping out consistently, re-booting over and over, or just locking up completely. A call to Tieline tech support resulted in recommendations to reinstall the firmware to the latest version, which had improvements that they said would take care of these issues. The installation went very well, and I am happy to report that since the upgrade, we have not experienced any of the prior problems.

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### News from the South

by

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

Hey, did you know we have an election coming up in 2020? Just checking (and my tongue is firmly in cheek – or as the kids online like to say, “[sarcasm]/[sarcasm]”). Our splendid media is intoxicated with this for some reason, which is inexplicable, because most people already know how they’re going to vote, and all the yammering and harping in the world is unlikely to change that.

I started that way solely because it allowed me to avoid starting this month’s edition with my usual yarp about the weather. I could probably cut-and-paste at least the first paragraph for every issue; this is Alabama, after all.

“Wet, rain, storms, etc., yadda, yadda.” In July, we made it through relatively unscathed, save for some sticky contactors (which I discussed last time). Scathed we were in August, however, at two different sites. More on that in a moment.

The good news is that the National EAS test seemed to go well, not just in Birmingham, but at all

of our stations nationwide. Cris was on vacation and had delegated to me the task of making the initial reports to the FCC. I was a bit flattered that he trusted

me to do that, but naturally, I was also a little nervous, because I’d never done it before. As it turns out, all of our excellent engineers across the country got their logs to me right away, and the FCC ETRS website was pretty much a no-brainer. Whew!

### **WXJC(AM)**

Our old Nautel XL60 at 850 AM continues to chug along without a care in the world, but we lost audio to the site sometime on the morning of

August 27th. I was headed to 92.5 when I noticed the dead air, so I turned around and asked Jack to look at things remotely while I sped my way to Tarrant. He said that the Tieline was fine, and that he could ping the site normally, but that the Omnia wasn’t responding. This was welcome news, if a bit surprising: as heavy as the rain and humidity were, I



wouldn't have been surprised if we were getting glitches and dropouts. But the Bridge-IT was solid.

When I arrived at the site, as soon as I walked in, I saw the dreaded Psycho-Delic™ screen on the older Omnia.5. We were temporarily on that instead of the newer Omnia.9, and I guess that turned out to be a good thing. Repeated attempts to reboot the 5 were unsuccessful, so I started rigging and rewiring to get the 9 back in service. At length, I had us back on air.

The Omnia.9 sounds really good, but it has one of the most non-intuitive interfaces I've ever seen. When I first hooked it back up, the XL60 was badly overmodulating, while the night transmitter, a Nautel ND2.5, was barely audible. It took some hunting and poking, but I found the desired output adjustments and got everything tweaked into legality. The touch screen slider bars leave a lot to be desired, in my never-humble opinion. Sometimes a larger, more easily adjusted bar would pop up; sometimes it wouldn't. Trying to set a level on the tiny little bar, without hitting all of the other sliders, was a task with my fat fingers. But we gotterdid.

#### **WYDE-FM**

By the way, as proof that I'm getting older, I've told the staff to refer to our sites by frequency, rather than call letters, when they contact us with a problem. My brain has been hardwired for many years to think of "WXJC" as 92.5 FM and 850 AM. When we changed formats on 101.1 FM last fall, it took the WXJC-FM call and 92.5 became WYDE-FM. This caused no end of hilarity for Todd, Jack and me at first, because so many of the labels in our Wheatstone systems had the call letters. Once, I even headed to the wrong site at first because I was so conditioned to thinking that "WYDE" meant "101.1 FM in Cullman!"

Moral of this story: don't use call letters in your equipment labels. Use site names ("Red" for "Red Mountain," "Cul" for "Cullman," etc.) or use the frequency (92.5, 101.1, 93.7). Perhaps I'll get that straight in my head eventually, but for now, if the staff needs me to run screeching to one of our sites, it's probably best to say, "Hey, 1260 is off air!"

At 92.5, the phone line isn't just prone to lightning strikes; it seems to attract them. In fact, it is a giant black-hole-like vortex that seems to pull them in. (You may recall a previous LO issue where I posted pictures of a thoroughly-cooked and shattered phone demarc outside.) We've put as much protection as we can on the phone line inside the building, chiefly because we were tired of replacing and repairing equipment. Of course, this means that

the lightning will destroy our protection, but it costs much less to repair that than it does to fix the remote control or alarm panel.

This time, the demarc survived, but the fuses that we have in line had not merely blown, they had melted and welded themselves to the interior of the plastic fuseholders. I bought some replacement fuseholders and got the phone line back in service; I've ordered some parts from Digikey to repair and replace the protection circuits again.

The original Nautel FM5 at 92.5 was a war horse. It ran for over 15 years with very little trouble: we had to replace a cooling fan, as I recall, but that's it. The new Nautel GV3.5 is just as rugged, and I'll give it to Nautel: they provide a very effective surge suppressor to put in-line with the AC to the transmitter. It protected the GV, and it was on air, chugging away happily when I arrived to see why the phone didn't work.

Incidentally, the first suppressor box that Nautel sent with the FM5 was actually 3-phase, but the transmitter is single phase 240V. That left an additional lightning arrester circuit that I was able to put on the AC line to the equipment rack. Free, Nautel-grade protection that is still working!

#### **Web Server**

Earlier in August, Keith Peterson informed me that Bill McCormick was unable to upload some Crawford Stand audio to our web server. Around the same time, we started getting some weird, inexplicable "bad certificate" errors on certain sites. Finally, Keith said that he was unable to do some updates and changes.

These seemingly-unrelated problems were most likely due to corrupt data on disk. That web server hosts over a dozen different sites, so it's very busy. The drives are constantly being updated, written, read and changed. The database on that thing is always stroking. The old caveat about making sure that the machine is always shut down "cleanly" especially applies to something like this.

Enter the XFS file system, supposedly one of the best available for Linux and other POSIX clones. Windows defaults to something called "NTFS" (NT File System), and to be fair to Microsoft, it has become very reliable over the years. Being fair to XFS, a lot of people are running that, too, and Red Hat installs it by default.

Without getting way out into the weeds, this is a “journaling” file system. That is, before it does a disk write, it stores information about what it’s going to do; then it does it; finally, it updates the journal, saying, “Gotterdid.” If the power is interrupted during this process, normally (in italics for a reason), the journal will help the drive recover when the computer boots back up. At most, you will only lose the files that were actually being written when the fault occurred. Normally. It is possible, however, if the timing is just wrong, for serious corruption to occur.



**Figure 1 -- The server stack in Denver. The primary web server is third from the top, a hot-rod Dell PowerEdge R430 that we installed last fall.**

A tool is provided, logically enough, called “xfs\_repair.” However, using it will make you a bit tense, because it requires that you “unmount” – essentially, disable – the drive in question before you can run it. It will not work on a drive that is currently in use (which makes sense, if you think about it). I had to take the web server off line while I was rebuilding the entire /home directory on our server.

Remotely, from home, hundreds of miles away from the server, which is in Denver.

Adding to my nervousness was the knowledge that a few years ago, the hard drive on my own computer at home had become corrupted, and xfs\_repair hadn’t been able to truly restore it. I had to delete the entire journal, then hope that the xfs utilities were able to restore things to the point that I could boot. I got it to come up, then found that the SMART utilities were warning that the hard drive was going bad. I had to replace it and restore from a backup.

Back to the web server. Keith keeps backups of our sites, and I do my own backups from time to time, so we did at least have that. But in this case, thank the Lord, xfs\_repair did its job. We may have lost a couple of files, but it was able to get the /home directory repaired. I remounted it and the web server came back up. The mysterious certificate error problem also went away, so that must have been due to drive corruption, though I can’t really understand that (the certs are stored on a different partition).

Ensuring that the web server is on a good UPS, and making sure to follow good shutdown procedures, are especially important on a multi-site, multi-user system. It’s entirely possible (and routine) to have several people updating sites at the same time. The database is being heavily modified, stuff is being read and written all over the place, and data is flying around madly. A power interruption, or a hang followed by a hard reboot, are truly Bad Things™ in this case.

No other pictures in this installment, but we should have plenty next time. Todd is experimenting with SNMP monitoring for our systems, and I hope to grab some images of the “New and Improved (For The Nth Time)” phone line suppressor at 92.5. Plus, the never-ending work on 101.1’s tower lights continues.

Until next time, keep praying for this nation!



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

The ability to properly prioritize workflow may be the number one asset a chief engineer or anyone managing a multi-faceted engineering department can have. If you have more than one station to manage, you will eventually find yourself conflicted. There will be issues that come up at the same time for each station and you will have to decide who gets your attention first.

In an ideal world, problems would come up one at a time. But that's not the way it works. Priorities often get shifted in mere moments. The obvious comes to mind, and that is a station off the air. While we never want it to happen, a station off the air should take precedence over any other issue and the decision making for priorities is easy.

The not so easy situations are where you have two problems that could cause an off air problem soon on two or more stations if action isn't taken. Let's say you had to put the top billing 50 kW FM station on the backup transmitter because the main went off air. Now you get a call at the same time that your 1 kW AM station, which has very little billing, is experiencing audio dropouts.

In both of these situations, the station is still on air. On the one hand, the most noticeable problem is the audio dropouts, so you could make a very good case for addressing that problem first. Listeners and your staff most likely don't even know that you're on the backup transmitter on the FM, but the audio dropouts on the AM have a greater impact on listener awareness.

On the other hand, if you don't have great confidence in your backup transmitter and it goes down, the greater impact on your company billing will occur if the FM is off air than just having audio dropouts on the much lower billing AM station. So, you could make a case that the potential loss of revenue is far too important on the FM station, and you decide to work on the main transmitter at the FM site first.

Revenue is certainly one way to set priorities. While most of us come from a technical background, we logically realize that our very jobs depend on the maintenance of the station revenues. So, it is imperative for every engineer to know the stations in your charge and what the priorities are. If you don't know, talk to the general manager. They should let you know.

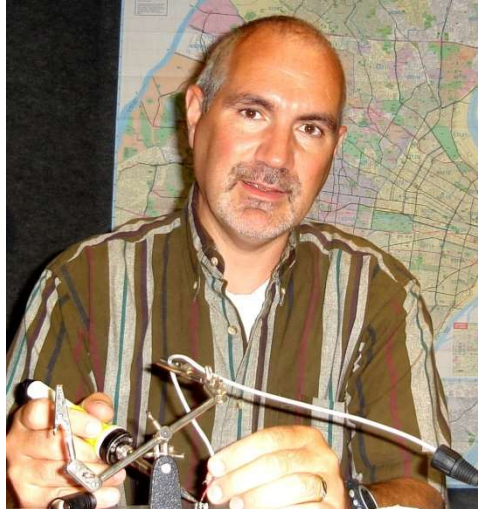
However, it may not always be as cut and dried as prioritizing by billing. Sometimes, if the problems are something that recur on a regular basis, you already know what is most likely the fix. In the scenario above, if I know that the AM audio dropouts can most likely be fixed with a quick

reboot of the audio codec at the transmitter site and the repair of the main transmitter at the FM site will probably take hours of my time or may need a part that I have to order, getting the AM audio fixed and getting it off my mind so I can concentrate on the FM could be the best plan.

On the other hand, if I knew that the main FM transmitter most likely needed a reset of the high-voltage breaker to get back on air and the AM audio dropouts might soak up more time to figure out, I would most likely go the FM site at first and then take on the AM audio problem later. Priorities may change considering the billing and how quickly I could get the FM station back to optimal status.

Sometimes the ease of fixing an issue might put it at the top of the list. I learned this concept when taking timed tests in school – always solve the problems you can answer quickly then come back to the problems that are harder to solve. If you take a long time on one problem and then miss questions on the test that you could have easily answered, your score could end up a lot lower. It takes experience and knowledge of your facilities to be able to make those kinds of decisions.

Another way to look at how to prioritize your facilities is investment. Your company's



investment into one station over another will likely tell you what the company considers important. The transmitter at one site might cost more than all of the equipment at another transmitter plant. If you're making a critical decision on where to spend the most time, the investment made by the company should definitely be considered.

Sometimes you may encounter what the company is saying versus where they actually spend dollars. It's one thing to say something is a high priority, but the reality is that actions are louder than words. I was working for a company that told the engineers that the streaming was just as important as the terrestrial stations. It rang hollow to me because we had a large investment in backup transmitters for the terrestrial stations but only once encoder per

streaming station.

What that tells me is that they were okay with the streaming station being off air until engineering can fix it or replace the encoder. The reality is that there is less investment needed to have a backup encoder for a streaming station than there is to have a backup transmitter for a terrestrial station. Yet most stations do not have backup encoders. To my personal knowledge I have never heard of a station having that. I'm sure some do... I just haven't encountered it.

For me, there are no hard and fast rules to prioritizing when it comes to choosing between two simultaneous problems. I generally let revenue and investment be my top indicators while at the same time leaning on experience and common sense as a secondary.

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

I am learning to hate computers. I will come back to that later. First, something more interesting.

Here in Portland, the local EAS group has been discussing ways to improve transmitting emergency information to the public during a disaster. One huge tool that emergency managers use is the geographic information system (GIS). GIS is a framework for gathering, managing, and analyzing data. GIS integrates many types of data. It analyzes spatial location and organizes layers of information into visualizations using map presentations. GIS is a major resource during a disaster response.

Some time back, the Portland area had a discussion about creating a broadcast GIS layer for the area. We initially talked with the state to include Portland broadcast information as part of the state Raptor data. Recent discussion has highlighted the importance of this information statewide. As a result, broadcasters will be meeting with the Oregon OEM to discuss the specifics of a broadcaster layer. This is a major opportunity for broadcasters across the state. The information will allow emergency managers to identify areas that broadcasters need access in order to keep public safety information flowing. It will make our job easier when the "big one" happens.



Now the computer story...

Here in Portland, we have begun upgrade of our old Nexgen computer hardware. This is not a project that has so far gone well.

First, and isn't there always a first, we needed new computers that would provide space for the current sound cards. Second, we were forced to go Windows 10. Sorry about that... there was no other choice. Third, we found a form factor that would work and ordered the additional computers, but they didn't ship and went into a black hole somewhere. Forth, we reordered and got a different computer. Dell had evidently discontinued one model and replaced it with another right about the time we placed the order. The full-size sound cards would fit in the new machines, so we moved forward, until one of the brand new computers died. Two service trips later, the new machine is fixed and working.

Here I will skip ahead to make a long story a little shorter....

103<sup>rd</sup>, a gigabit switch died slowing any transfers down.

Did I mention that some days I hate computers? Now keep in mind my first was a TRS80, which I used for complex impedance



calculations. Later, I graduated to UNIZ based systems and C-shell scripts. That venture included working with one of the original Xerox GUI developer.

Xerox spent quite a lot of money learning the proper parameters for a proper human interface. For example, they observed that pictographs are to be avoided. The move from pictograph to phonetic

written languages was a major advance.

Then along came Windows. Eliminating the word “pictograph” and replacing it with “icon” didn’t change the historic reasons for moving to a phonetic system.

With all these newfangled computers, it seems we didn’t learn a thing.

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

### **J1000 Power Modules**

It seems the new KLDC Nautel J1000 transmitter likes to blow through power modules. We already had one go out and we repaired it with the help from Steve Braley at Nautel. The most recent failure, which occurred last month, occurred on a blue-sky day when I noticed the power wasn’t what it should be, so I logged in using NX-Link and found the same module had blown again.

I went out to the site, pulled the module and brought it back to the office for troubleshooting and repairs.

Why the office? Because that transmitter site doesn’t really have a good work area with decent light, and because of the limited space in our transmitter room, we cannot add anything to help.

Nautel has been really good with their manuals at having a troubleshooting section where it tells you exactly what to test. I did that and replaced a few parts and went back to the transmitter site and plugged it in. All came up with no issues.

This is the second blown module since the transmitter was installed in January, so we will have to keep a close eye on it to see if this is going to become common.

### **Mowing**

It seems mowing season has come to an end. Keith spent a few weeks mowing at the KLVZ and KLTT transmitter sites. The KLZ site never really grew up much this year, which was nice.

During the mowing at the KLTT site, Keith contacted me one day because the tractor died and

wouldn’t start. I was actually off that day, but picked my dad up and we drove out. I may be smart about some things, but I know enough to know I don’t know anything about tractors! We drove out to the

tractor which happened to be parked at the furthest tower and began investigating.

We quickly determined it was not a battery or safety interlock issue. My dad took the fuel filter off and right on top was a big glob of something nasty. This was clearly the issue. Junk in the fuel.

I’m not sure it was ever written about, but at the

beginning of the season, we went to fill up the tractor with diesel. We had two yellow diesel cans full of what smelled like diesel. My dad soon found out that it was actually water when it died while he was using it! He was able to drain it completely and we refilled the tank with real diesel, and it’s been running fine.

We figure some of that water remained in the tank, bonded with some gunk, and with all the jostling around from mowing 65 acres of prairie dog hole dotted prairie, that water and gunk got loose and into the tank sump. From there, it got into the fuel line and completely clogged it. Since we couldn’t get it out, we ended up using the air compressor and blowing air through the line and back into the tank. That dislodged the clog. Hopefully it also blew it into small enough pieces that it will make it through the fuel line and into the filter. So far, so good!

We also found some items on the tractor’s three-point hitch bent up and broken. We still have no clue how it happened, but will blame unavoidable prairie dog holes. My dad was able to get thing



rigged up so Keith could get the mowing finished, but we still need to replace the parts. We have the replacement parts sitting in the garage at the KLZ transmitter site and will install them once fall arrives and we get a cooler day.

### **KLVZ Night Parameter Issues**

One weekend while at our mountain home in Grand Lake, Colorado, I began getting some alarms that the KLVZ night parameters were off. I logged in to the ARCPlus remote control and could see the transmitter power was showing 125%. The common point current was high, and all the tower parameters were indicating off the charts.

Knowing I was three hours away at best, I had Keith go out and at least look for anything obvious, which he did not find. I made the necessary adjustments remotely, reducing power so we could keep the station on overnight, and the next day I stopped by on my way home from the mountains. I looked in all the ATUs and in the phasor and didn't see anything blatantly obvious.

Not knowing what else to try, I decided to switch to the aux and back a couple times to move the RF contactor around. This evidently shook things in the phasor cabinet around enough to bring things back into tolerance. The next day we went back out and focused on the phasor. We found several really loose connections that may have been the cause. It's been stable ever since.

I used to go to all the ATUs and phasors every year and make sure all the hardware was tightened up, but I guess it fell off my radar and hasn't been done in a few years. With this happening, I will be making it a point once it gets cooler to go around and make sure everything is tight and clean.

### **J1000 Time Issue**

We found out recently that the J1000 does not keep time very well. I had noticed this a while back but forgot about it until the other night when I went to check on all our sites. I did so about five minutes before sunset and found KLDC already at night power. I looked at the NX-Link and found the clock ahead by six minutes. The next day, I went to the site and adjusted the clock back to where it needs to be, but I can see this becoming a huge problem for

us, and for others, who rely heavily on the internal scheduler. What good is a scheduler if the clock can't keep accurate time? Until a solution can be found for keeping the time correct, I will have to make it a point to check it weekly and go to the site to adjust it as needed, since it can't be adjusted remotely using NXLink.

### **Coming Up**

August always is a quick month. We typically go on a family vacation the first full week of the month. This year, things went well during our vacation. Just a few minor issues that I was contacted about, but Keith did a great job at keeping everyone happy and things working. It was a great time of fishing, ATVing and just relaxing. I already cannot believe that was nearly a full month ago.

September is always inventory month. Actually, the end of August and the beginning of September, but I got a tad lazy this year and have been putting it off. I am hoping that this year I did a better job at keeping track of things during the year so I won't have much to do in the update. I worked really hard to remember to tell Elizabeth about any changes we made whether it was moving an item to a new location, making a deletion or even adding some stuff. I am sure things will have been forgotten. The way this usually works is we get through the list and find all but maybe a page of items for which we have to go searching. I pray this year it is much easier than in years past.

I do plan on driving to Texas for the Labor Day holiday. Not for the holiday exactly. You see, I am a huge Backstreet Boys fan. They were here in Denver while I was on my vacation to the San Juan Mountains in early August, so I missed it. I then had the bright idea to buy tickets so my mom and I could see them in Dallas on September 1<sup>st</sup>. My husband is being a sport and driving us down there for the weekend. We plan on going to Waco to see the Chip and Joanna Gaines empire. Hope to see some of my family and then head back on Labor Day. A quick trip, but no doubt a fun one.

I look forward to the cooler temps of September and the changing leaves. That about covers it for this edition so until next time... that's all folks!!!

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The Local Oscillator  
September 2019

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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*

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

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

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

**WDCZ • Buffalo, NY**  
*950 kHz, 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*



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