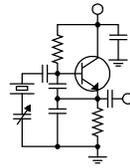


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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Good Riddance... Or Not

There is no debate. 2017 has been one of the most difficult years of my life.

Amanda reminded me on November 30 that one year ago that day, she and I were tag-teaming on the replacement of a rack controller board on the KLTT NX50 transmitter – a two-person job if there ever was one. It was during that work, while I was down on the floor at the KLTT site, that I got several bites from small, whitish spiders that tend to hang around inside the floor troughs at that site. I don't know what those little spiders are, and they are almost certainly not venomous because I have been the recipient of many of their bites over the past 21 years with nothing more than a little red bump at the bite site. This time, however, one of the bites got a little infected, but within a week or so it was all fine again – or so I thought.

Right before Christmas, my lower left leg started aching. It got better, then it got worse, then it got really bad. I saw several doctors and got several bad diagnoses before my primary doc figured it out. Infection deep in the leg. Seven surgeries and five months later, the infection was gone and I was sporting a couple of muscle and skin grafts.

Over the next few months I went from being immobilized to a walker to crutches to a cane to limping around like Chester on the old Gunsmoke serial. I was on powerful IV antibiotics until the middle of the summer, and my weeks were measured in doctor visits – sometimes three or more in a given week, not to mention physical therapy once or twice a week.

As the year winds down, I am thrilled to be done with doctors. The physical therapy continues, and while I'm still limping a bit, I can go a half mile or so on the treadmill and I am generally getting around okay. Every week I am a little better than the week before, with less pain, better range and better

mobility than the week before. The doctors told me to expect the full recovery to take into late April, so I've still got a ways to go, but I'm pretty doggone happy to be where I am right now.

I have often thought throughout the past twelve months that I would certainly be glad to see 2017 in the rearview mirror, and as the year winds up, I am glad to be where I am as opposed to where I was a year ago. However, my travails of 2017 have been accompanied by some significant spiritual growth as well. I have learned to trust in God in a whole new way. With all the down time, I have spent a lot more time in the Scriptures as well. On the whole, I'm in a better place spiritually than I was before all this started, and for that and the healing, I am grateful. With the psalmist I can say, "It was good for me to me afflicted so that I might learn your decrees."

So... goodbye 2017. I would say it's been fun, but...

Looking Ahead

The 2018 engineering capital budget is done, and it looks like a good one. It includes some transmitters, a stack of audio processors, some 48-volt DC UPS units, phone systems and other goodies that are sorely needed in strategic spots throughout our company. I very much look forward to a good year of small projects ahead, keeping our facilities on the leading edge (but not the bleeding edge) of technology.

Along that same line, my goal for 2018 is to maximize the listener experience for every station in our company. That means that each and every station has to sound as good as it possibly can given the limits of its allocation and technology. It also means that wherever possible, we must provide Artist Experience and other ancillary data that listeners are coming to expect.

The same goal applies to our internet streams. With the proliferation of “smart speakers” (and the expected surge in smart speaker placement during the holidays), we expect a corresponding surge in stream listening. Smart speakers will bring our internet streams into the living spaces of our listeners; they will no longer be confined to their computers and mobile devices. We’ve got to be ready, and our streams have got to sound great, with no tune-out factors to irritate listeners.

In some markets, we’re experimenting right now with developing Alexa skills that will allow the Amazon Echo to recognize station names. We may expand this to other markets and stations at some point, but it’s less critical for stations that use their call signs instead of station names – you can tell Alexa to “Use TuneIn to listen to WDJC” (or whatever).

I would also like to do some further experimentation with transport of Wheatnet-IP over our Part 101 microwave links. We tried this recently in Detroit without success, but we believe the problem is actually with the 802.11 Ubiquiti devices that we use for the data connection between building and microwave equipment on each end. Apparently, that equipment does not pass IGMP traffic for some reason, meaning that even though only one or two 5 mbps streams need to be transported, all eight streams get pushed through, and when we have only 48 mbps of bandwidth to start with, that’s a problem. I want to find a way around this issue.

From this vantage point, 2018 is shaping up to be a good year. I really, really hope that it will be. I could use a good year.

UASs

For the past couple of years, the FAA has required licensing of pilots of Unmanned Aerial Systems (UASs), sometimes called Unmanned Aerial Vehicles (UAVs), if the purpose of a flight is to be commercial. That means that any UAS use in the

context of our company would require a licensed pilot.

Back in October, I participated in an SBE webinar on UAS use in broadcasting that was hosted by my friend Sam Wallington of EMF Broadcasting. I learned a great deal about becoming licensed to fly UAVs commercially and made the decision to pursue that licensing.

In the course of that pursuit, I found that already-rated and current pilots (private, commercial or ATP) can obtain their “remote pilot” license by simply taking the FAA’s free online UAV course and filling out an application; no test is required. That made things easy. I took the online course in about an hour one day, then filled out and submitted the application in the FAA’s online IACRA system. After that, I had to get a certified flight instructor to log in to IACRA and make a couple of certifications,

including that I was current with my private license and that my photo ID and private pilot certificate matched up with the face of the guy standing there. That was all there was to it.

Now I can use my personal UAS, which is a well-outfitted DJI Phantom 2 with 3-axis gimbal, GoPro camera and “first-person view” (FPV, which allows

me to see what the camera sees in real time on a monitor mounted above the remote control), to inspect our towers. If there is a problem with a microwave link, for example, I can run the Phantom up the tower for a look at the antenna, radio and interconnecting cables. If a cable is loose or has a cracked outer jacket, the climber that we send up can be prepared for that. I can also make post-installation inspections of tower crew work, inspect paint jobs after completion, and otherwise look over hardware, guy wire attachments, antenna attachments and transmission line connector weatherproofing.

We’ll see how all this works out in the coming months, and if it goes as expected, we may consider getting some of our folks in the various markets licensed for UAS piloting.



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

Hello to all from Western New York! The month of November was quite busy with transmitter issues at all three of our sites here.

I have mentioned in past reports that we have been experiencing a problem with the 970 transmitter's modulation level. When the modulation was brought up to 100% positive peaks, the transmitter would fold back momentarily with VSWR faults on the controller. After checking at least a half-dozen possible causes, we finally found it. Cris checked the impedances from some measurements made in 2004 when the phase rotation network was installed, and found that the impedance slope was horrible ± 5 kHz from carrier, especially on the positive side towards 1270. The plus side of carrier produces a VSWR of 2.5:1 and the negative side, 1.8:1.

The Optimod audio bandwidth was set to 6 kHz, which was far exceeding what the duplex system would pass. Once I changed the bandwidth on the Optimod to 5 kHz, the antenna system is much more forgiving and we can produce 125% positive modulation peaks, with negative peaks around 92 – 95%.

On the FM transmitter side of things, we have experienced a hat trick of failures in the Nautel NV-40 transmitter this month. First, we lost one of the PA driver modules in one of the PA amps. Then we had one of the switching power supplies go bad. Then, rounding out the month was a bad cooling fan in one of the RF modules.

In all, this transmitter has been relatively stable and dependable since it was installed. I have talked with other NV model transmitter owners and found that this is not necessarily the norm. Several have reported numerous problems, especially with the PA boards and switching supplies failing at alarming rates. I haven't seen their installations, but I would gamble a steak dinner that their issues could be solved with upgraded grounding of the transmitter and feed line.

Turning to the WDCX(AM) transmitter site in Rochester, we had a power outage on

Thanksgiving night. After power was restored, Earl Schillinger noticed slight 'blips' in the audio every 5 minutes or so. I had him listen to the audio being sent to the STL system, and everything there was fine, along with audio being fed to the Omnia processor.

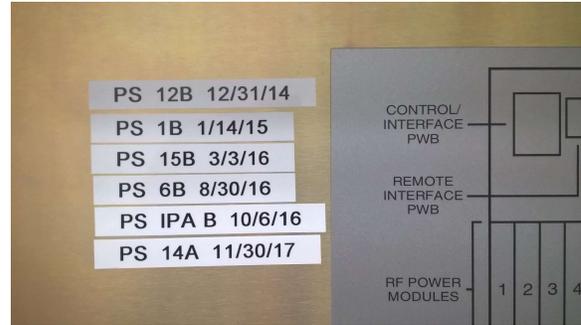
On Monday, when I got to the site, I found that the Nautel IBOC exciter was causing the audio 'blips' on air. The HD carrier was off, and we were getting a fault LED on the exciter, indicating a loss of communication with the importer/network. After working several hours with Scott MacLeod at Nautel customer service, he determined that the issue was not field repairable and issued an RMA for the unit to be sent back to them for repair.

I have struggled recently with getting the audio on WDCX-FM sounding better. It's not that it was sounding bad by any means, but in comparison to other stations in our market, we just didn't have the fullness and presence that we should have. I'll be the first to admit that my ears are not what they used to be, and audio processors are much more complex than they used to be.

As we were getting ready to upgrade our Omnia.11 with G-Force, Cris thought that he would send Brian Kerkan over from Detroit and have him install the upgrade and set the processing up, as he is quite familiar with these units. And what a great job he did! WDCX-FM is by far the best sounding radio station in the Buffalo market, thanks to Brian and his magic! In fact, within 24 hours of his making changes in our Omnia.11, I received two calls from Buffalo market chief engineers wanting to know what new equipment we had purchased and installed! Thank You again, Brian, for your diligence in getting our air sound "just right," and for teaching this old dog some new tricks!



From time to time, I like to offer up some maintenance tips that could help you in maintaining your facilities. Now, I know everyone keeps a maintenance log for the transmitter site, right? Each and every thing that happens and repairs that are made are logged in the maintenance log, but have you ever had to thumb through several years of logs looking for failure patterns in your transmitter? That can be a pain. However, I have a \$20 solution. Dymo Labels. These label makers are really cheap, and if you replace a module/fan/filter etc. in your transmitter, make up a label stating what was replaced and attach it somewhere handy. I prefer to put these directly on the module repaired, that way I can, at a glance, tell if there is a re-occurring problem with that particular module. (and they are easy to remove if you wish).



Removable labels help keep track of maintenance items.

That about wraps up another month here in the Northeast. Until we meet again here in the pages of The Local Oscillator, be well, have a very Merry Christmas, and happy engineering!

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

Greetings from the Motor City! November was a month in which we have a lot to be thankful for. I found out I have another grandchild on the way, and on Nov 1st, we brought WMUZ-AM 1200 to life as “The Salt of Detroit.” The new Nautel NX-50 was put on the air using our end-to-end Part 101 IP microwave link.

Everything went as planned, and all ten towers are switching flawlessly at night. I am in the process of using SNMP with our ARCPlus Touch remote control at the 1200 site. We worked with AT&T to get a backup link in place with automatic switching in case of a primary link failure.

There was a fantastic kickoff party for WCHB 1340. It was an opportunity to bring out some of our gear and provide sound for several Gospel recording artists, including Tasha-Page Lockhart. We dusted off our 24-channel snake, Mackie console and portable PA system and went to work. You can see some photos at the following two links.



The event was a huge success, with hundreds of listeners attending. It was such a great time connecting with our listeners. Photos are available at the two links following this column.

Later that week, I hit the road and visited Brian Cunningham in Buffalo. We visited the FM and AM sites and prepared to upgrade their Omnia 11 to G-Force. The G-Force upgrade essentially turns the Omnia 11 into a completely new processor. We made some changes to route the composite into the Nautel transmitter, loaded the update into the alternate bank, and applied the feature update. We decided to wait until later in the evening to reset the processor. Brian treated me to some awesome authentic southern BBQ. We worked late that night, but it was definitely worth it. After dinner, we returned to the FM transmitter site and rebooted the Omnia 11, and it came back to life in its new blue color. It didn’t take us long to get everything set up and sounding great.

The following day, we went to the AM site. We needed to get more consistent audio through the

STL. This was an opportunity to have Wheatstone and Orban work together.

One of the great features in the Wheatstone Blade 3s is a built in AuraIIP Pro audio processor. To use this processor, you will need the Aura IP GUI. The software is free and is supplied by Wheatstone. Once installed, you can log into the blade and configure it the way you would any full-featured audio processor. In this case, we used the blade processor to do peak control and leveling ahead of the STL.

There are so many great uses for the blade processor. You can use it for headphone processing, Internet encoder stream processing, or remote feeds. We set up the Wheatstone studio blade to pre-process the STL, and touched up the Orban, making a drastic improvement to the consistency and quality of the audio.

It was a nice trip, and I really enjoyed working with Brian C.

For the remainder of the month back here in Detroit, we started installation of a new Telos phone system in the WCHB studio, and ordered a dumpster

to do an overall building cleanup, disposing of old gear and leftover scrap from the WMUZ-AM transmitter installation.

We have been able to qualify for Comcast



Figure 1 - The AuraIIP Pro GUI Screen

fiber, and I look forward to switching from our cable modem delivered data and voice services to the fiber in the near future. The new connection has a service level agreement and QOS controls.

Until next month, '73 from Brian, W8FP.

<https://www.facebook.com/WCHB1340/videos/vb.162079067164995/1675230135849873/?type=2&theater>
<https://www.facebook.com/WCHB1340/videos/vb.162079067164995/1675234295849457/?type=2&theater>

News from the South

by

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

Look at all of the “inappropriate behavior” scandals in the news lately! Charlie Rose (Charlie Rose?), Stuart Smalley (I mean, Al Franken, sorry), Garrison Keillor (say whaa?), Joe Barton of Texas (ewww), John Conyers (hmmm...) and of course, Matt Lauer of NBC. That’s as of this writing. I’m sure I’ve missed a few and I’m equally sure that more “revelations” are coming.

You might assume that this is a sure sign of the End Times, but I’ve seen a bigger one. Waffle House now does catering! Yep! Waffle House: that Georgia-based chain of pre-fab restaurants that look (appropriately enough) like canary yellow single-wide trailers with windows. Waffle House; which cranks out more fat-filled hash browns than Cumulus



does worthless stock certificates.

Unlike Cumulus, Waffle House isn’t bankrupt. They’re swamped with customers,

especially at night when most other joints are closed. They’re doing quite well here in the South. The staff at your local “WaHo” may look like they were transported to work via UFO, but hey; you can now hire them to bring some ‘taters and bacon to your next gathering! Is this a great country, or what?

Roy Moore

You can blame Georgia for Waffle House, but I guess Alabama is to blame for all of the “inappropriate behavior” accusations. After Roy Moore was accused by several different women, the floodgates opened. (But still ... Garrison Keillor??)



Figure 1 - Truly, the apocalypse is at hand.

Democrats smell blood in the water, and money is pouring into our state. Well, I hate to spoil the suspense, but Moore is likely to win. His own internal polling, again as of this writing, shows him with a 5-point lead. Most of his core supporters continue to back him. That much is painfully obvious from our callers and from comments on social media. You read it here first.

As for the polls, now that telemarketers and scammers are calling mobile phones, most of us won't answer if we don't recognize the number. I think the polls have become useless (or worse).

And finally, people who hate Christians in general will continue to hate us. To them, I very kindly say: don't get upset when we don't act according to your prejudiced stereotype of what a "Christian" is. You see us as hypocritical, self-righteous, judgmental curmudgeons. Sure, there are some people like that who wear the "Christian" label, but in reality, a true Christian is simply a sinner saved by grace. True Christianity is a personal relationship with God through Jesus Christ. That's all it is and all it ever has been. We know how much God has forgiven us, so we love, we forgive and we move on.

Web Server Fun

Otherwise, there's not a lot happening here. The weather has been fairly decent for a change, although we did have some severe storms that forced our STLs to backup in mid-November. This time of year, with the holidays upon us, things tend to settle down. Now is the time to get caught up on projects and problems that have been pushed onto the back burner.

Among those projects are our Corporate servers. In mid-November, the Web server went down due to a software glitch during an update. I was frantically trying to repair it remotely when Comcast out in Denver decided to go on holiday; I couldn't access the server. But finally, Comcast came back up,

I found the problem, and we managed to get the server back online.

That incident, though, exposed our need for a hot standby on our critical servers. Backups are well and good, but Keith Peterson, who maintains copies of all Web content, had suffered a hard drive crash just prior to this event. He was in the process of restoring his own backups while I was trying to repair the Web server. Things were tense for a few hours there, to say the least.

As a result, Keith and I have been working together now for a couple of weeks to get the backup Web server ready to go. It's not a simple matter of copying everything from one PC to another, because of the way that WordPress stores links and other data. (I've ranted about that here in the past.) But we're getting there, and if nothing else, we do have more than one backup, ready to go in the interim.

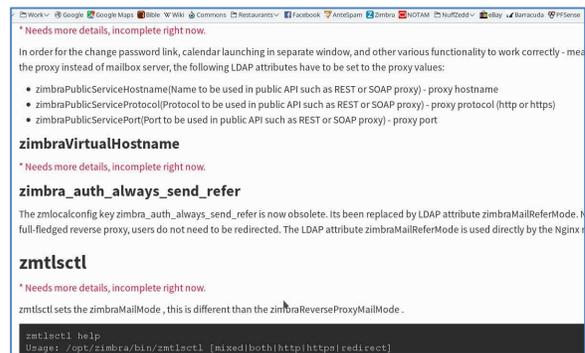


Figure 2 - From Zimbra's official Wiki page on their proxy stuff.

... And Mail Server Fun!

Y'all know I love open-source software. Apache, MySQL (or MariaDB, nowadays), PHP, all running on a good, hardened Linux "box" ... well, it's just hard to beat. Best of all, the price ranges from dirt cheap to absolutely free.

But the drawback, obviously, is that the only available support for "free" software is online forums and a Google search. It doesn't help that the available documentation for most free software projects is both sorely lacking and out of date. Those of us who love free software, like Todd and me, have learned to work with this. But it can be aggravating ... or worse.

We have had a few isolated problems with a handful of employees being unable to receive some email. It's very hard to run down, because the logs – when they show anything at all – only give a cryptic error message that makes no sense. One of our standard approaches when faced with something like

this is to upgrade the software to the latest version, just to make sure we're running the most recent bug fixes and security patches.

Our Zimbra email software is generally robust and has given us surprisingly few problems over the years. I've upgraded it several times. In each case, I simply downloaded the package from the Zimbra website and ran the installer. It would take about 30 minutes, then the server would come back up, ready to go, with the latest patches and bug fixes.

This time, though, was different. We're currently running version 8.6; I wanted to try version 8.7. I downloaded it a few weeks in advance and started preparing. (There's an 8.8 in beta, but Stephen Poole and Todd Dixon don't do betas. Oh, no, no no.) The first time I ran the installer, it said, "you must have proxy running." Ah. OK. I had never installed that in the past because we didn't really need it.

I downloaded another copy of the 8.6 installer. I re-ran it with the proxy packages. I started the server and everything seemed OK. But the newer, 8.7 installer still complained, "no proxy." Zimbra's official Wiki wasn't much help (see Figure 2), so I pored through the forums and did some more Googling. I discovered that the installer simply puts the proxy packages in place. YOU have to go in and manually enable the ports and change the configuration to actually get the proxy running. Hah, hah! Those geeks, you have to love them ...

The Crash

Anyway: after entering a bunch of cryptic-looking gibberish in a terminal, I had the proxy working on 8.6. I tried the installer for the newer 8.7 version again. This time, it made it past the proxy check just fine, starting installing packages ... and suddenly clanged to a halt. "FATAL ERROR."

That's not what you want to see at 9PM. After some frantic investigation, I confirmed that it was indeed fatal. That installer had corrupted our mail server's database. After a few frantic Google searches, I hit upon the best news of all: Zimbra had just recently updated that upgrade. "Hey, don't use the version that we put out a few weeks ago, it has

some gnarly bugs. Instead, use this one." Hah, hah again! Thanks a lot!

Fortunately, I always make a complete, byte-to-byte backup just before any upgrade or update, so we were in fairly good shape. The only problem was that our mail store was now over 400 gigabytes, so it would take many hours to copy that data back into the server. More Googling, and after learning more about Zimbra's internals that I thought I'd need, I was able to just restore the damaged database and get it running again. I was praying the whole time; thank you, Lord.



Figure 3 - Hiding in the shrubbery not allowed!

That showed me the need for a hot standby on the mail server. I've been working on that in the evenings, as well.

The Lights

I mentioned this last time, but I'll leave you with one more photo. The new lights around our studio building look nice. They do a great job on the parking lot, and they also light the grounds right around the building. Some bad guys like to hide in shrubbery to ambush people when they enter and leave at night, so that's a little extra security.

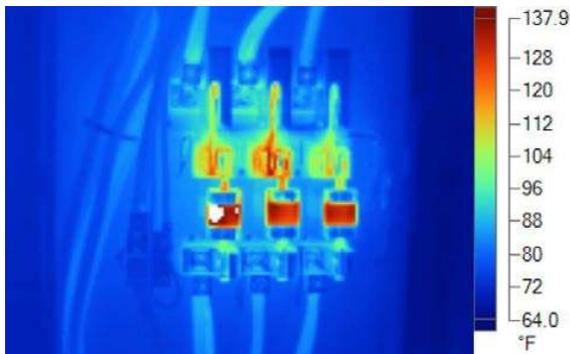
Until next time, thanks for praying for my wife Sandy. She's slowly and surely getting better. Also, keep praying for this nation!

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

Back in my October article, I reported on a problem that took WPWX off air. A blown fuse in the main disconnect inside the building, but downstream from the generator, had caused both transmitters to be missing one phase of their three-phase power feed. Obviously, this condition would not allow either transmitter to go on air.

Once the fuse was replaced, we were back on the air. We then tried to figure out why the fuse blew in the first place. As reported, my guess at that time was that a blower motor locked up on one of our Eubank air conditioners, taking the fuse out. We discovered the blower motor was bad the next day when we had high room temperature alarms that afternoon.

Still, we wanted to make sure there was nothing else within the electrical system that might actually be the cause. We hired a commercial electrician to bring out his professional infrared camera and take pictures of the entire electrical system to see if there are any hot spots that might be an issue.



One of the disconnect photos from the thermographic study. All is well.

The results showed we had a clean system. There was nothing that showed any really hot lugs or connections. At that point, with the electricians, we took a little closer look at the Eubank air conditioner blower motor situation. The question, why would the circuit breaker for the air conditioner not trip but instead take out a 250-amp fuse?

We took measurement of the actual amperage on each leg of the overall three phase electrical system and found that it was normally running at about 210 amps. So, we didn't have a big margin for a temporary surge in current caused by a motor locking up. Still, why a fuse and not the breaker?

It became rather obvious once we examined the circuit breaker. It was a three phase, 70-amp breaker. I went outside to check the rating on the wall mounted Eubank air conditioner and it was rated at 60 amps maximum. I'm not great at math in my head but with only 40 amps to spare and a circuit breaker already overrated for its assignment, the weak spot was going to be the 250-amp fuses. Math, science and logic all coming together to show the obvious.

Now, this particular Eubank air conditioner was added to the prefab building later, and was not part of the building when it was delivered. There are two more Eubanks, the exact same model, that were part of the building in its original configuration. They, too, had the 60-amp maximum rating. However, when I checked the circuit breaker box, the breakers for the Eubanks, which I assume were installed by the factory, were 40-amp breakers. To my knowledge, we have never had a problem with these breakers tripping. So, we decided that replacing the 70-amp breaker with a 40-amp breaker was part of the solution to making sure this didn't occur in the future.

Another part of the solution that was suggested by the electrician, was to replace the 250-

amp fuses in the inside disconnect with a higher rated fuse. The inside disconnect was rated for 400 amps, so we could definitely up the amperage rating of the fuses. Since we're running normally at about 210 amps, I decided that 300 amps would be a good compromise between safety and keeping the station on the air during temporary high current events.

This meant we had to take the station off air for a while, and this necessitated a midnight session. I figured about 20 minutes off air to get all three fuses changed out. I told programming that it would be about 30 minutes off air. This was simply changing three fuses in a main disconnect, what could go wrong?

Well, that's a question always fraught with unforeseen potentialities. In this case, I never saw this one coming. After getting the fuses swapped out, my crew went to turn the power back on by moving the lever on the disconnect to the "on" position. When they did this, the three blades of the switch didn't go back into their slots. They tried several times to get it to go, without any progress.

These disconnect boxes have spring-loaded movement, so that there is a quick and forceful action needed to place all three blades into their respective slots at the same time to avoid arcing. We were approaching nearly an hour off air, and we needed to get the situation resolved. Keep in mind that we were dealing with 208 volts on the slots of this box, so it

had to be done cautiously for safety reasons. Still the show must go on, so the crew found a large rubber mallet and persuaded the blades into the slots to get us back on air.

So, the saga of the event that took place in late September is still not over. Wisely, we are pursuing replacing the inside disconnect box with the bad spring action. Of course, this will mean a much greater time off air. Due to the format of the station, overnights are not a dead time. There will be considerable listeners that will be affected and revenue will be negatively impacted as well.

Our hope is that the box can be swapped out in under five hours. If we take the station off at midnight, it is imperative that we be back on by 5 AM for the morning drive time, which is a big revenue generator. Since we are this close to the end of the year, we are waiting to schedule until January. Management and programming are more favorable to wait, since January billing is usually lower than other months and the ratings battle is a little less fever-pitched at that time.

The electricians have assured me they can do it in under five hours by doing a lot of the pre-work ahead of time, like cutting the holes in the box. After the last planned off air maintenance, I'm a little nervous about making it within the five hours, but there isn't much choice here; the disconnect needs replacing, and we have to be off air in order to do it.

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

At press time, we are deep into preparation for winter. Predictions this year vary from mild to cold and wet, with an apparent bias to more ice and snow this season. Due to limited snow and ice removal resources, winter can be interesting here. With our facility at the end of a lengthy power line, we often see surges and outages in excess of that experienced by a typical customer.

Few weeks remain for preparation until forecasts become weather. A bit of planning now can produce less panic later.

Continuing the theme of preparation, I am proud to note that the broadcast engineers travel

credentials program is in full operation. Now that the normal issuing process is in operation, we begin to expand the team of engineers available to respond during a disaster.

As I write this, I am reminded of the historic spirit of service that local broadcasters bring to the table during an emergency. Those early broadcast experimenters developed a relationship with their local communities. The engineer's camaraderie of serving the public continues to this day. I recall more than one occasion when a fellow engineer at a

competing station loaned equipment or parts to allow me to get back on the air.



Over the years, broadcasters have been quick to adopt new technology. Early remote broadcasts used utility-provided copper wire. Sixty years ago, broadcasters first utilized “modern” VHF and UHF equipment (RPU) to provide remote news coverage. In recent times, the RPU has been displaced by wireless and internet connectivity. Most news reporters have never seen RPU equipment, a phone coupler or that dinosaur, the pay phone.

Last month, I talked about the National Periodic Test collision at the local Portland Local Relay Network. I have received several questions about that, so a few details are in order.

Here in the northwest, we don’t get hurricanes or large tornados. We think a snow flake is a major weather event. Around sixty years ago, we did get a big windstorm, and that is all in the past. We do tend to think that a major disaster happens elsewhere.

In reality, the event we do expect is a seduction zone earthquake. These earthquakes happen on average around 300 years. That’s a lot of time to forget, although the potential is for a 9-point quake, which is the base line for a real emergency in the North West.

With that potential in hand, responders quickly realized that the normal communications facilities would be non-existent. Cell and Internet facilities are highly complex and vulnerable. Northwest broadcast engineers quickly realized that broadcast of emergency information will rely on the old RPU equipment, which does not require extensive and complex infrastructure.

Now the challenge becomes relearning how to implement that old technology. Training reporters to use RPU technology isn’t likely to be successful. Making the equipment foolproof, then, becomes the priority. Good Luck.

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

KLTT Pattern Change Issues

KLTT’s issue with pattern change began coming back more frequently the last few days of October. Finally, on the 2nd of November, during a trip to the site, my dad and I dug a little deeper into it. We found a few issues and thought we might have had things fixed. We tested the pattern change several times, and each time it worked normally. That night however, it did not change.

My dad and I immediately decided to go ahead and go to the site to deal with the issue again, this time in the dark. We dug deeper into the issue and decided to clean a relay in the controller, thinking this was where the issue was. The LED on the relay was lit, but there was no continuity across the NO contacts.

I think my dad enjoyed going with me to the site. This was a day my husband had to work his second job, so I took my dad as my body guard.

After cleaning the relay, we put things back together and still noticed an issue. That’s when we finally found that the issue was at the tower. We did some snooping around out there with a DVM,

checking across the microswitch that should be closed when the contactor was in the night mode. It didn’t take long to find that while we had a dead short across the microswitch contacts, there was a high resistance across the two terminals to which the multi-cable going back to the building connect.

There is a big Phoenix connector that provides the 24 VDC and 240 VAC connections to the slave relay board that operates the RF contactor. A quick resistance check confirmed that there was a short on the slave relay board side of the connector (good) but a high resistance on the other side (bad). We unplugged and re-plugged the connector a few times to break apart any dirt and oxidation that might be stuck in there. That did the



trick, but we figured it would be a temporary fix at best.



Dad at the workbench at the KLTT site cleaning a relay. He used a dollar bill to burnish the contacts.

Unfortunately, on this dark night, I didn't think to bring any Deoxit to the tower, and to be honest, I did not want to drive back to the building, which is on the other side of a canal that bisects the property, and back to the tower in pitch black. It is pretty unforgiving when the sun goes down. Thankfully, working that connector cleared the issue for a couple weeks.

When the issue came back, I drug my husband out with me. It was spitting rain/snow that night, which was irritating, but since the issue was back, it had to be dealt with. I went prepared this time with Deoxit. We decided to completely kill the power to all four towers, and we went to each one. The rain/snow got heavier with each tower. When I went to lock the gate at the road after finishing up with the last tower, I could hear the rain pick up greatly. As of now, it seems cleaning the phoenix connectors with Deoxit worked.

Track Lighting

When we moved into our office space back in 2010, we inherited the fluorescent track lighting in the studios that the previous tenants had. Those lights have worked fairly well over most of that time, having minimal issues. However, in recent years, the little ballasts have failed, and finding new ones has proven difficult and costly. Clearly, it was time to replace the lights.

The track systems being used today are different than the ones we have. So just replacing the light fixtures is out of the question. The track would have to be replaced as well. I decided to replace the track and light fixtures in one room to see how it would go. I bought a new track, new fixtures and LED bulbs. I must say it looks a lot better.

With that success, I decided to go ahead and order the rest of the stuff we need to get done with all the studios. We have four control rooms, four talk studios, two production rooms and an office that have this track lighting system. I look forward to getting things replaced with something newer that will allow us to easily replace parts if need be.

End of 2017

It is hard to believe that it is December and 2018 will be soon upon us. I think 2017 is a year my family would like to forget. Most of you followed the story of my dad, surgery after surgery early this year. On my Facebook timeline at the end of November, it popped up with a picture of Dad working inside the NX-50 transmitter at the KLTT transmitter site, helping me replace the rack controller board.

This was a day of us tag-teaming and working to replace that hard-to-get-to board inside the transmitter. We're certain that this is where he got the spider bite that we believe caused all the health issues. It would be another month before things got so bad he had to go to the ER a couple times, and still weeks/months beyond that before they finally found the real issue as to why he wasn't getting better, only worse.

This was a time of me driving my mom to and from the hospital daily because of how far it was. It was a time of having to learn to stand on my own

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two feet at Crawford. While I am confident I can do the job without my dad around, having him there supporting me has always been something I enjoy. I enjoy our drives to transmitter sites and our weekly lunches together. Not many adult daughters can say they get to spend so much time with their dad and actually enjoy it. It was definitely a growing experience for me.

When Dad finally came home the very end of April, we were all thrilled to finally be done with it all. We fully trusted the Lord that the infection was finally gone. The only thing left to deal with were doctor's appointments and dealing with the doctors always reminding him/us that this could come back any time. It was nice to hear last month that he is

finally done with the doctors. While we know he is mostly healed, it is always good to know the doctor finally thinks so too.

We hope 2018 doesn't start out as badly as 2017. I am looking forward to Christmas coming up and spending time with friends and family. I will work on getting as much of the track lights done as possible. Other than that, we don't have any major projects planned, so I am guessing it will be like any other December. Slow and boring at times, with the occasional issue to make me busy for a day or two. I always welcome this time of year, as it allows me to relax a bit and prepare for the upcoming year.

That about does it for this edition, so until next time... that's all folks!!!

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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

KLVZ • 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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