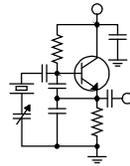


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

JULY 2018 • VOLUME 28 • ISSUE 7 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR

A New Translator

Just before press time, the FCC granted our application for a new translator for WDCZ(AM) in Buffalo. This application was filed in the last (Auction 100) window, and it was a singleton. It will be a 150-watt translator on 94.1 MHz at 469 feet above average terrain, employing a 10-element Yagi antenna oriented 35 degrees True.

Long term, we may well increase power on this translator. The original application was for 250 watts, but in the long-form filing, I backed that down to 150 watts to keep the contour on the U.S. side of the border. We can likely get 250 watts with Canadian concurrence, but that's likely and not certain, and I didn't want to take a chance on a problem with Canadian coordination possibly delaying (or outright killing) our application. It was, after all, a one-shot deal.

We may also think about moving it closer into Buffalo at some point, depending on the coverage we get from the Boston site. Of course, we would have to pay rent at any in-tower site, so that would have to be factored in.

So, what's left? Just Rochester in terms of new translators. The mutually exclusive (MX) status of that application has been cured by a filing made by our friends at Genesee Media. At some point soon, we should get notification that our application is now a singleton and we're good to file the long-form application.

We still have the issue of the 107.1 MHz Detroit translator to deal with. Readers may recall

that we voluntarily shut this translator down to eliminate interference to a co-channel station out west in Ann Arbor. We are currently looking at some other sites and may well file an application to move to one of them soon.



Objection Dismissed

It has been all over the trade press that the FCC dismissed the informal objection that the Prometheus Project et al filed against all the outstanding translator applications. Prometheus, an LPFM advocate, alleged that the FCC had ignored the requirements of the Local Community Radio Act in its four AM translator windows. The FCC said, "Au contraire," and broomed the objection aside, immediately granting 600+ of the outstanding translator applications. Prometheus can still appeal, but the FCC gave them a pretty good "smackdown" in the dismissal,

setting the bar very high for any appeal.

Uplink Registrations

Back in May, we took advantage of the FCC's 90-day (recently extended another 90 days) C-band earth station registration window and filed registrations for most of our existing C-band downlinks, the idea being to (a) provide those earth stations with interference protection, and (b) to bolster the number of C-band earth stations that the FCC knows about and considers in its proposal to open up the C-band satellite frequencies for terrestrial mobile broadband. In June, we got grants on all those registration applications, so we're as good as we'll ever get in that regard.



Word is that the FCC will take up this issue at the July meeting. I sure hope they consider the ramifications of shared use of longstanding C-band satellite spectrum. Undoubtedly, the wireless carriers are pushing this.

We've known since Marconi that there is a finite amount of data that can be passed in a fixed amount of bandwidth. With the ever-increasing demand for data bandwidth by mobile devices, the demand for more bandwidth by the carriers is also increasing. They simply cannot meet the demand within the constraints of the frequency bands they have been allocated, so they are pushing to take spectrum away from existing users for their own use.

It's going to be interesting (in the Chinese proverb sense).

Equipment Upgrades

We continue to upgrade our audio processors throughout the company, replacing 2003-vintage Omnia.5EX units with new Omnia.9 processors. Those things are *amazing!* That's the sentiment shared by everyone after we install them. When you can scan the radio dial in a market blindfolded and easily tell which stations are Crawford's, that's something, and that's what we get with these new boxes. We find our stations head and shoulders above the rest of the stations in the market.



In addition to audio processors, we have replaced the main transmitters on two of our Detroit

AMs, WCHB and WRDT. Those Nautel J1000 transmitters are amazing boxes. We've had one on the air in Denver on the night site of KLVZ since 2005, and it still amazes me – it's one of the loudest signals on the dial. Now we've got the same box on the two lower-power Detroit AMs, and of course we have a new NX50 on 50 kW WMUZ(AM), which means that with the new processors, we've got the very best AM signals in the market. That's the idea.

Comments

Crawford Broadcasting filed comments in a couple of different rulemaking proceedings in recent weeks. One was in response to the FM translator interference proceeding, and the other was on the proposal to share the C-band with mobile broadband. Anyone who is interested can read what we filed on the FCC's ECFS page or at http://www.crawfordbroadcasting.com/Eng_Files/Comments/.

Some Sad News

It is with sadness that I report that Dick Warren, chief engineer of our San Diego station, KNSN, passed away on June 20. Dick had told me on the 18th that he was out for a while with a medical issue and that another local engineer would be watching the store for him. I didn't know it but he was then in the hospital following a stroke. He apparently had another stroke on the 20th, and that one took him home.

Dick was a real sweetheart, a gentle soul and a delight to work with. He had been our engineer since September of 2014, and I did not have a single complaint in all that time. He took great care of our station. He will be sorely missed this side of heaven.

Welcome!

The sad circumstances notwithstanding, we welcome Bill Lipis as the new contract engineer at KNSN. Bill comes highly recommended, first by the fact that Dick entrusted him with watching over KNSN during his hospitalization, and also by other respected engineers in the market. We very much look forward to working with Bill going forward.

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

Greetings from the Motor City! Summer is here, and with that comes air conditioning maintenance. Even with proper maintenance, things can and will happen from bad contactors, to start capacitors. Even condenser fan motors after sitting over the winter can become an issue.

And so it was on the first really hot day here in Detroit. The temps were over 97 degrees, and two of our A/C units at two transmitter sites failed. Fortunately, I was able to make the repairs necessary, and it helps that we have HVAC parts outlets close to our transmitter sites. If I had to wait on a contractor, it could have been several days until the units were fixed. We have a schedule to check filters and belts, as well as cleaning the coils on the condensers.

Our new Nautek J1000 transmitters are on the air for WCHB and WRDT. The new installation gave us an opportunity to clean up some of the wiring, and to lay things out a little better in the transmitter rooms.



Figure 1 - 10-tower AP screen for WMUZ(AM).

We had a contractor come in to remove large trees in the guy wire paths down at the WRDT site. Several years of growth had presented a real danger of trees falling and taking a tower with them.

We had our large “Law Day” event with live

broadcasts for WMUZ and WCHB. The event also had live music. We provided the PA for the bands, and I am glad our planning paid off. We bought two mixers, in case we had an issue. It’s always good to plan for such a thing. In this case, it paid off. The Mackie console let out a puff of smoke and the smell

of burnt electronics when powered up. We were able to reconfigure our setup with the backup mixer and everything went well. No one was aware we even had an issue.

One of the things I am currently working on is a Burk-based silence sensor screen that we will use in the control room to replace the old Enberg panels. It will provide flexibility and tie in to the system we already use for monitoring.

I really enjoy developing custom views on Autopilot that are both easy to use and see. I try to lay everything out to make it easier for the operator on duty to respond when needed. Figure 1 shows an example of the 10-tower screen I put together for WMUZ(AM). I wanted to make sure that the critical measurements are readable from across the room. I like the number of tools that are available to integrate external sources, which include security cameras.

At long last, I have received my CSR SPI programmer, which I ordered a few weeks ago. I plan on doing testing and development of the CSR 64215 chipset for high quality wireless Bluetooth audio transfer to Android and Apple devices.

I am trying to further streamline remote broadcasts here at CBC-Detroit down to a very clean implementation. If everything works as planned, all that will be needed is a cellphone or wireless tablet device and an XLR pro microphone and my custom adapter. There are other solutions out there, but this solution would be under \$20 and provide excellent bidirectional audio.

Hopefully I will be able to report on my testing in next month’s issue of *The Local Oscillator*. Until then, “73 from Brian W8FP.

News from the South
by

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

Hey, I get to talk about storms again!
Imagine that.

We have had unusually severe weather for weeks now, with lots of rain, hail, gusty winds and lightning. (You know, Alabama.) But on Saturday June 9th, we got whopped. Lightning struck the power feed to the 120 Summit studios and knocked four out of our five stations off air. Todd was on vacation, so I called Jack to come in and give me a hand.

Getting Back on the Air!

My first big gig as a Chief Engineer was for a lovable roustabout named Don Curtis.

He's moved up in the world; he now operates Curtis Media Group, which owns a few stations here and there (including the legendary WPTF AM and WQDR FM in Raleigh, NC). He had a saying: "Dead air don't make the company a bit of money."

With that in mind, I started trying to restore signals. WDJC-FM, WYDE-FM and WXJC-FM were all off the air. WYDE(AM) was off as well, but somehow, WXJC, good ol' 850 AM, had managed to stay on. When I arrived at the studios, alarms were beeping and there was a faint smell of smoked electronics in the air. I ignored the beeps and squeals (one of the loudest alarms was coming from our fire alarm panel, which we have since learned, will need to be replaced), trying to get our two big FMs, WDJC-FM and WYDE-FM, back on.

One of the squeals was coming from a small KVM that we were using for some computers in separate racks on the engineering room floor. It was so dead, all it could do is make a sickly squeak. The main KVM, the one that lets us work on all our primary servers, was badly damaged as well. Let me tell you something: it's hard to troubleshoot computers when you can't see them! Fortunately, Todd had installed VNC on all our key machines, so I was able to work with them that way. It was slower than itch, but it worked!

I switched WYDE's audio server on, and thank the Lord, it came back up. But WDJC-FM's audio server was truly dead. I tried another power supply, but I was getting nine beeps and a flashing

red light when I switched it on. According to HP's Post Code chart, that meant "motherboard failure." Yay. I called Jack to come in and give me a hand, so he hopped in his car and flew.



ECR Didn't Work

When I tried to put WDJC-FM's Nexgen into the Emergency Control Room (ECR) mode, the control machine locked up and wouldn't do anything. It just wouldn't work. We've had this happen before and we've talked to RCS Support about it. They couldn't find anything wrong, but I have a theory. I'm going to share it with you in case you ever suffer a

similar meltdown.

When you start ECR against a dead ASERV, I think ECR is unable to figure out where you're at in the logs. Maybe that's why WDJC-FM's ASERV hung. Maybe if I had let it time out for several minutes, it would have finally made its best guess and would have started on its own, but Windows had already pulled up a "This program is not responding" box. I restarted, then reloaded the local database on the control room machine, it still hung. Rebooted; it still hung. Maybe something had gotten gibbered when we took the lightning strike. I don't know. Either way, we were down for the count on WDJC-FM. Back into engineering I went.

Even though he was on vacation, Todd was helping as he could via text messages. I confirmed that WYDE(AM)'s ASERV wasn't doing anything. 1260 was pretty much a full-time simulcast of 101 unless we had ballgames. When Jack arrived, I had him start copying WDJC-FM's logs over to 1260's idle ASERV to get some audio back on air. He also did the routing and X-Pointing (working around bad channels and balky equipment!) while I turned to the STLs.

We have an old Moseley 6000-series STL for backup between the studios and the WDJC-FM site on Red Mountain. The main channels on the DSP-6000 are WDJC-FM's stereo audio; Aux 1 is a mono WYDE backup and Aux 2 is a mono WXJC backup. Both Aux channels were showing meters (which explained why 850 was still on air), but

WDJC-FM on the main channel was silent. The Wheatstone Bridge Router cage had taken a hit. Yay again! Rather than take the time to troubleshoot it then, I made up a cable and took the outputs that drive the engineering room speakers and plugged that audio into the DSP-6000. Back on!

A Dead Dragon

The first thing I checked on the Part 101 Dragonwave microwave link to Red Mountain was the power supply. It was dark, so I grabbed a handy spare supply. When I opened the power injector box, though, I saw some burned components (Figure 1). We had one spare on hand at the studios, so I grabbed it and mounted it on the wall. Powered up ... and still no Dragonwave. The green indicator LED in the injector box was blinking, which told me that the radio on the roof wasn't drawing power. Unfortunately, the wind was still gusting strongly, and we still had a lot of lightning, so I couldn't go up and check it.



Figure 1 - The lightning strike also killed the Transtector and the Dragonwave radio.

We had a spare Nanobridge already mounted in place. It's less than a 5-mile hop, so we figured it would serve as a backup. Unfortunately, it was dead as well. The Cisco switch on our STL links had some bad ports, too. Yay, and yay again! But by patching and rerouting, and thanks to that old Moseley warhorse, we had finally got all our primary signals on the air except for 92.5. By then, it was getting very late, and I headed home for a few hours of sleep. The weather was supposed to clear up in the morning, and we would look at the rooftop stuff then.

Jack came in Sunday to help again. I pulled a spare HP computer from one of our production rooms, moved the hard drive from WDJC-FM's old ASERV into it, and made it the temporary (but official) ASERV for WDJC. While I was doing that, Jack stopped by the WDJC-FM site on Red Mountain on his way in, whence he discovered several downed trees in the road (Figure 2). He had to hike all the way up that hill to put a patch cable in place to get 92.5, WXJC-FM, back on air. When he came on to the studios, we turned to the Dragon on the roof. The Transtector was smoked. Powering up the radio still didn't bring it back on, so I pulled out a spare Dragonwave radio and programmed it. Once Jack mounted it on the roof, yes! We had a data link again, thank you, Lord!



Figure 2 - Just two of many trees down on the road to the WDJC transmitter.

Assessing the Damage

In addition to WDJC-FM's audio server, we lost our local FTP server. It was fried. The latter also hosts our CBCEngineering email accounts, so those were down. I sent out a warning to all our engineers, warned our staff that there would be no traffic or weather, and figured I'd hand that off to Todd on Monday, when he returned from vacation. Cris made up an emergency order for a replacement audio server for WDJC-FM, and a replacement Dell for that FTP/mail server. To get us by in the meantime, Todd found an ancient machine that was able to do the job (if a bit slowly) until the replacement arrived. I installed the CBCEngineering email virtual machine on it and by Monday evening, that mail was back in service.

We're still trying to determine all the damage. It's scattered all over the place in the 120 studios, and if you've ever suffered a Big Strike like

The Local Oscillator
July 2018

this one, you know that problems may not show up right away. For example, Sunday morning, the 10th, the live church service that airs on WXJC tried to dial into our old Matrix unit, but it didn't work. It had been killed as well. Yay, yay and yay. Another credit.

Incidentally, WXJC(AM) did briefly go off the air late that Saturday night. The strong winds had ripped loose the tower lighting cable on tower #3. It fell onto the ground, arced and then cooked itself. Once enough wire had been eaten away that it was no longer touching ground, the Nautel transmitter allowed us to go back on air. I love those transmitters!

Troubleshooting that problem revealed a bad flasher unit; it doesn't look like anything else was damaged. I've ordered a replacement and we're under a NOTAM until it comes in.

The Never-Ending AOL Saga

And speaking of NOTAMs, we may have set a record with that AOL atop WYDE-FM's 1,380-foot tower in Cullman. We have been unable to get that thing to sync up with the other lights, and unfortunately, the FAA rules require that. Everyone

must blink together. We had a tower crew pull the assembly (which TWR calls a "cone" for some reason) down to the ground, and I've been looking at it while talking to TWR tech support.

The test that I came up with was to feed 220 AC to power the strobe, while I connected the RS-485 "Field Bus" (actually, a ModBus) to the controller. I set the "cone" on an ancient bucket of sheetrock mud that has been there since we moved into that building. I figured that would insulate it well enough.

When I powered up, the unit would flash, but the controller didn't see it and it wasn't in sync. This is supposedly a brand new, just-manufactured "cone" straight from Orga in Italy, but it doesn't work. The guy with TWR suggested holding the reset button while I flipped the breaker off and then back on. Given that the button is only a few inches away from the 3,000 V strobe supply, I'd like to have someone around when I try that. Call me chicken, but that's just me.

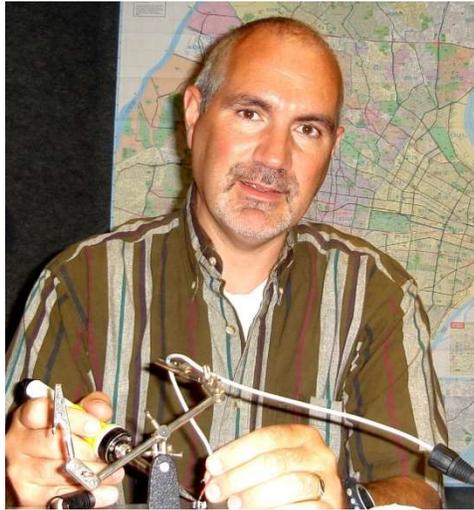
Until next time, keep praying for this nation!

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

Show me a broadcast engineer who has never knocked a station off the air accidentally, and I'll show you an engineer who works behind a desk.

Working in live equipment racks can be very precarious. A hand dragging across the wrong cable and suddenly you have a station off the air. I know at a previous post, I seemed to have a knack for finding all the loose audio cables that were just about to fall out on their own. The IT Coordinator gave me a hard time by proudly proclaiming that I had knocked more stations off the air in my first six months than he had done in six years. Of course, how often do you take a station off the air while working on a salesperson's laptop?

These booby traps are always waiting there to make you look bad. I remind my crew here in Chicago that before they do anything significant in a rack, take a minute and push in all the power, audio and Ethernet cables. I have heard the click of an Ethernet



Recently, I gave that reminder as one of our engineers was working on pulling cables in one of the racks in the rack room. However, we found another booby trap besides loose cables this time. He was moving a cable around as he was guiding it to its destination. In the space of ten seconds, the cable dragged across the back panel of the UPS in the bottom of the rack, hitting a reset button each time.

This caused all the power to be removed from all the equipment in that rack... twice! The rack contained all the STL equipment for all of our stations. Suddenly, we had all four stations off the air! I was standing in front of the rack when it happened, and as soon as I saw it happen, all I could do was stare and wait for everything to boot back up. I also had to listen to the pounding on the rack room doors as the program directors lined up to let me know we were off the air.

Once we got back on the air and I evaluated



Figure 1 - Exposed reset buttons on the back of the UPS.

connector more than once as we practice this important face-saving step. Like a good belt, it keeps you from having your pants on the ground at the wrong moment.



Figure 2 - The Bud box "bush fix"

what happened, I realized that there was a serious design flaw with this particular UPS, which is "real good" since we have at least five of these. The reset button is on the back panel and sticks out unprotected and easily accidentally pushed. Whoever designed this obviously was never an end user.

The Local Oscillator
July 2018

Rather than resorting to hollering and pointing fingers, I knew it was best for my staff to learn the lesson and come up with a solution to keep it from happening again. In this case, it wasn't too hard. All we really needed to do was to hide the reset button to avoid having it pushed accidentally.

I found a small Bud box that would cover the three reset buttons on the back panel. I just

placed this over the buttons without the cover of the Bud box being used. I attached it to the UPS by using fairly heavy-duty packing tape. I only taped the top side of the Bud box so that the tape would also act as a hinge to allow us to quickly hit one of the buttons when we needed to do so.

My hope is that this will be enough to keep this from happening again!

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

Here at KCBC, we have just installed a new Omnia.9 audio processor. It is quite an awesome device. I feel like we have jumped decades ahead in technology. The station is louder and cleaner than it has ever been. I noticed a dramatic improvement in the quality of the HD audio as well. The merits of the processor have been well documented in previous editions of The Local Oscillator, so I don't feel any need to go into any great depth on the details.

I will say that in the last 30 years or so, I've seen many processors. The first one I used was a Gates "Solid Statesman" limiter to which I added an equalizer on the front end. How things have changed! There certainly has been a great progression of technologies that have been implemented for AM stations – some famous, and a few infamous. This is the first processor that I have ever installed that made me say WOW!...several times!

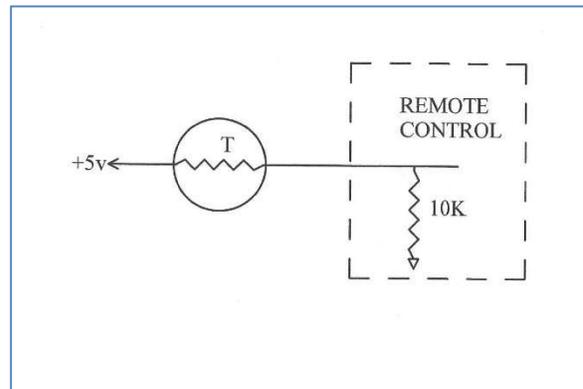
Monitoring transmitter sites using remote control systems is something that we all do. Monitoring transmitter parameters, antenna parameters, and tower lighting is part of the normal and essential monitoring that must be done. One item that seems to get overlooked is measuring temperatures in the building.

I present here one very simple and very cheap way to monitor temperatures. We simply take 5 volts, usually available from the remote control system, and connect it to a thermistor. The other end of the thermistor connects to a metering channel on the remote control system.

The correct thermistor must be chosen, and it needs to have a negative temperature coefficient. This means that the resistance of the thermistor

decreases with increases in temperature. As can be seen on the diagram below, the thermistor and the internal load resistor of the remote control system create a voltage divider. When the temperature increases, the voltage applied to the remote control metering circuit also increases.

The thermistor used herein is Mouser part number 527 – NK123C5R2. Using this device along



with the assumed 10K ohm load resistance of the remote control metering circuit (use an ohmmeter to check the input resistance of your remote control channel), we can expect acceptable performance for the purposes we need. If the remote control system is calibrated at 88°F with this thermistor, we can expect the temperature reading to indicate 36° for an actual

temperature of 32°, and an indicated 116° for an actual temperature of 120°. This is plenty accurate for what we normally need when monitoring building temperature.

For the purist, a 47K resistor can be placed across the input of the metering channel (assuming an internal load resistance of 10K ohms) which will bring the temperature error at the above extremes to within a degree. The target load resistance for this thermistor is about 8,000 ohms.

The thermistor is so small that it can be placed directly onto a 37 pin D-sub connector, or placed on a terminal strip. The thermistor costs about

a dollar, so if one so desires, several could be placed at different locations in the building, transmitter, air conditioners etc. I have found that one for the building is quite sufficient. I use this at every site that I take care of. They have been 100% reliable and have given me early warning of temperature excursions on many occasions.

For those that like to do their own research and experimentation, I refer you to a couple of websites: www.electronics-tutorials.ws/io/thermistors.html and www.electro-tech-online.com/tools/thermistor-resistance-calculator.php.

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

In the past, I have often referred to predictable and usually unwelcome events by reference to an oldie pop song, Henry the 8th. That song had “highly complicated” lyrics:

“I’m Henry the eighth, I am. Henry the eighth, I am, I am.”

“I got married to the widow next door.”

“She’s been married seven times before.....”

Those lyrics are all very classic Herman’s Hermits, if not a bit boring. Now as Paul Harvey often said, the rest of the story. Moving on, the second verse begins:

“Second verse same as the first, I’m Henry the eighth, I am...”

That’s not as bad as the old 45 vinyl that repeats click, repeats click, repeats... Sort of like the reradiation and (lack of) detuning situation at Mt. Scott.

One constant at KKPZ is the number of towers located within a short distance of the station. All together there are seven (!!!) detuned structures near the station. A single tower is located to the south. At 170 feet and with a large cross section, this tower on average impacts KKPZ’s 120-degree radial

most noticeably. At the water district site to the Northwest are five detuned towers which impact the 30-degree radial markedly.

So... the scene opens on an apparently normal day until questionable 30-degree radial field intensity levels call for further investigation. At least I can initially eliminate the tower to the south. The bad news is that I will need to investigate five structures that are detuned.

This isn’t the first such investigation, or the second. Forty-second verse, same as the first.

A short description of the water district facility is in order. That location must have been a lunch stop for Johnny Antennaseed. That day he had a hole in his antenna seed sack. Towers grew like weeds in a location that is visible throughout the valley. Up close, the location is considerably less visible. To the north of the road, trees between the road and the facility screen the towers visually. Outside the facility, only two locations allow much of a local view of the towers.

So, this intrepid investigator opened the water facility gate with the knowledge that with five detuned structures, locating the problem might be difficult. But on entering the facility, one tower stuck out like a sore thumb. Whoa, there is a seven-bay FM antenna and three-inch transmission line missing!



The Local Oscillator
July 2018



That's kinda significant.

This location had been the dark FM facility location for a local IHM broadcast cluster. Looks like they pulled out and took the antenna with them. I made several phone calls and finally spoke with the engineering director for the local cluster.

The broadcast people didn't know it was a detuned tower, and the tower owner didn't know the antenna was being

removed. Seems like Sergeant Schultz on an old TV show, no one knew nothing!

Actually, this is a major problem. Work is being performed without notice or attention to making sure that detuning functions normally. The FCC rules now require prior notification (§1.30003).

I am now focusing on getting signage posted that leaves no excuse. Work performed without consideration of detuning is becoming a major problem.

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

Tower Parameters

I am ready to call the shifting tower parameter issue at the KLTT site fixed. You might remember that I mentioned several times about the parameters shifting intermittently on the Burk remote control. Last month, I mentioned cleaning the connectors and all was well, and all is still well.

We began having a similar issue at the KLVZ transmitter site with tower 1, but this was a real parameter shift indicated on the antenna monitor, not just a remote metering issue. I would go out and adjust the phasor to get it back, and the next day it would go out. Some of the time it would be fixed by the time I would arrive at the site. I went ahead and cleaned connections up, which worked for a few days. This last time I went out, the issue was fixed when I got there, but I decided to go ahead and go to the tower after looking at everything inside the building. I found the sample line connector in the ATU was a tiny bit loose. Was this the cause of the ratio drifting

at that tower? Most likely. It is amazing how something so seemingly small will have such a great impact on something. As I write this, we are two weeks being drift free. I pray that no more parameter issues at any of our sites for a good long while.



AM IBOC Exciter

We did finally receive the parts for the Nautel AM IBOC exciter for the KLTT ND-50 auxiliary transmitter. We got it all put back together and found

the transmitter was very unhappy. All the settings were the same as before, but we could not get the third-order IM products down below about -50. In fact, the adjustments we were making weren't making it to the transmitter. It was as if the controller was not talking to the engine.

We contacted Nautel and decided firmware was most likely the culprit, a mismatch between the controller and the engine. We had a similar issue several years ago on the NX-50. In that case, we did an update on the engine and it didn't play nice

afterward. The engine and the exciter need to be on compatible software.

This time, we re-flashed both engine and controller, all fairly easy to accomplish, and put things back together. Just like that, it played nice with the ND-50. I am very happy to say we are back at full HD and MDCL operation with our backup transmitter for KLTT.

Power Failure

The evening of June 19, I received a text from one of our board ops at about 5:45 PM, informing me the studio building suffered a power outage but that the stations were on the air. That was a good thing. It showed that our generator was working. There was some weird stuff happening in the studios, however, and the board op gave me some confusing messages about what he was experiencing. It made me think a phase of power was out and the generator wasn't running.

It turns out what he was seeing was the building generator doing its job running some common area lighting and our generator doing its job running studio equipment and lights. I went to the office, though, unsure at the time of what to expect. We had been experiencing some crazy storms. I was able to drive to the studio between storms. I checked and found our generator was running as it should have been. Then I began the trek up the stairs. The power failure forced a false fire alarm in one of the upper suites, rendering the elevators inoperative, even on generator power. After what felt like an eternity, probably more like 5-10 minutes, I arrived at our suite on the 12th floor.

Once there, I began making my rounds, beginning with engineering. All looked good in there. I found our Production A studio was dead and dark. The UPS would not power up at all. I removed the UPS from the room and decided to wait to plug things back in. I knew the power would come back on at some point and didn't want the room to be at risk for some sort of surge during the transition. Since it was late enough, I knew it could wait until morning.

The KLTT control room was also dark. It was the same type of issue. The UPS would not turn on. I knew the outlet it was plugged into was on the

generator, as a power strip that was plugged into the same outlet was lit up. But when I would power on the UPS, it would show it was running on battery, and as soon as things started booting up, it would shut down. I have an extension cord coming from another outlet with just one thing plugged into it, and decided to move the UPS to that plug. When I did that, it worked. I don't quite understand the difference from one outlet to another. You would think if it's on generator, regardless of the plug, it would work – maybe voltage differences between the phases? My goal was to make sure the station remained on air and that any operations overnight could easily take place if need be. After verifying everything else looked good in all the studios, I called it a night and headed out.

A couple days later, I woke up to a text from one of our early morning board ops that the KLTT Wheatstone G6 console was dark. I took my time getting to the office, since it was not an emergency and no one would be in the studio for at least an hour after my usual arrival time. I found the whole room dark. You guessed it -- the UPS died. I bypassed the UPS and plugged things in directly to a power strip on the wall. I took the UPS to the bench in engineering and found an error code that pretty much said only APC can fix it. So Micro Center, here I come! I purchased a new UPS for the room and it seems to work fine. If I had to take a guess, the issue that caused it to finally fail and not come back was all part of the issue during the power outage. It's giving me grief during the outage was just a symptom. I am thankful we have our rooms set up to bypass the consoles when they're not live. If not for this, we would have lost some paid shows.

Upcoming

We still have not begun mowing with the tractor. We've just didn't seem to have the amount of rain we normally do early in the month to cause all the growth. I have no doubt with the heavy rain we got the last couple of weeks that things will start to take off and we will be mowing in no time.

I should also be getting in a couple new Nexgen computers. We are working to replace all the old HP computers in the facility. We have three audio servers and two control rooms workstations left

The Local Oscillator
July 2018

to replace. In some ways, I look forward to installing these, but in other ways I dread it. What should be an easy task always seems to end up being very difficult. It's usually something small, too, but also something

that takes a while to find. I pray these all go by fairly quickly with little to no trouble.

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

The Local Oscillator
July 2018

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



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

email address: crisa@crawfordbroadcasting.com