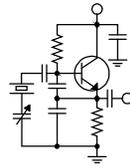


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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Spring has Sprung!

At long last, spring is here – flowers blooming, warmer weather, grass greening up, lightning striking our antennas, hail beating on our roofs and condenser units, tornados scaring us half to death... We all look forward to the arrival of spring, and then we can't wait for it to be gone so we can catch our breath!

Still, even with all the weather challenges that occur as winter struggles to become summer, spring is a glorious time of the year. The snow (eventually) goes away, and the world seems fresh and clean.

Here in Colorado, particularly in the mountains, we have another name for spring: *mud season*. It's a well-deserved moniker. As the snow melts and the snowmelt soaks in and runs off, it leaves behind a gooey quagmire that seems as if it will never go away! We very much look forward to summer when it will all dry up, and then we will complain about the high fire danger.

The point is, every season of the year has its challenges, and we learn to live with them. We learn to adapt.

Every year about this time, I watch with fascination the security cameras at the KBRT mountaintop transmitter site in Southern California. For just a few weeks, the site is green – and I mean really green. Late winter and early spring rains bring to life the dry, brown grasses and shrubs, and they make a mess of the five-mile switchback dirt mountain road up to the site. Then, almost as if

someone flipped a switch, the green is gone and the brown is back, and along with it the fire danger.

Before the brown returns, however, we have a brief window when we can safely work with an open flame outside, and this year we have some soldering to do. During the Canyon Fire that came within a short distance of the site last September, fire

crews with dozers cut some fire lines around the perimeter of our property, and someone also ran a blade over Black Star Canyon Road that runs through the south end of our property. We cross that road with our ground strap, and the blade cut deep enough that a piece of the strap was damaged. We need to fix it, and that involves “hot work” that can only be safely done while the surrounding vegetation is green.



For just a few weeks every year, the KBRT Oak Flat site security cameras show a green landscape.

I know our Alabama engineering team watches the approach of spring with great fear and trepidation, and this year was no exception. Already this year there has been severe weather and tornados right around our sites. Stephen sent me a photo of a car lot in Cullman, near the 101.1 site and its 1,380-foot tower, with cars positively *destroyed* by large hail. Thankfully, we did not sustain any significant damage from that one.

I am grateful that the change in seasons is a bit more benign in most other areas of the country in which we operate. It signifies a change from heat to air conditioning, from plowing snow to mowing grass. I, for one, am glad for the change and look forward to warmer weather.

Flexibility

For some odd reason, when our Denver studio facility was built out by the prior tenant, all the studio walls were done right – except one. Studio walls were built out using staggered, offset studs, 6” headers and footers, insulation woven through the studs and a double layer of drywall on either side. While the rooms aren’t “soundproof,” they are pretty doggone good. You can have a conversation in a control room and won’t be heard in the adjacent talk studio.

One room, the KLZ talk studio, had one wall that was not built right. That wall is the dividing wall between that studio and an adjacent tenant’s space, and it was built as a standard wall with a single layer of drywall on either side. Sound traveled freely through the wall. This was not a problem for KLZ, because the tenant space on the other side was vacant much of the time and the tenants that have been in there have been quiet. However, a new tenant, in the space for a few months now, has been complaining to the building manager about sound coming through the wall in his direction during the afternoon talk show, *Rush to Reason*, when there would often be four or more people in the room.

After a lot of investigation and experimenting, it was finally concluded that the best way to deal with the issue was to build another wall inside the existing one on the KLZ side, leaving an air gap between the new studs and the drywall on the existing wall. The building owner okayed the work, and a contractor was brought in.

Obviously, work could not go on during *Rush to Reason*, so we limited the contractor’s work hours to 7:00 AM – 2:30 PM. Still, there were some live programs and recorded events taking place in that studio during that window, so other arrangements had to be made. This is where the flexibility of the Wheatstone Bridge and Wheatnet Blade systems really came into use.

Amanda set up a preset for the control surface in the KLVZ control room that could be recalled with the push of a button and would, in essence, turn the KLVZ control room and talk studio into the KLZ control/talk studio. For those live KLZ programs, it was a very simple matter to move into the KLVZ control and talk studio, again, with just the

press of a button (and the press of another button put it back to being KLVZ).

Last month in several of our markets, we installed Barix Instreamer 100 codecs and configured them up as “radio streamers.” The purpose is to provide our people a way to remotely listen to any source in the system. The Barix in each market is fed as a Wheatnet or Bridge destination, so an engineer trying to remotely diagnose a problem or issue can remotely route a source to the Instreamer and then listen to the stream on his/her phone, tablet or PC. They can tell in a hurry if something is wrong – wrong satellite feed, low or noisy audio, missing audio or whatever. They can also confidence check a route to be sure it’s working correctly, something that until now they were unable to do remotely.

All this is to say that we are very much enjoying the flexibility that our older bridge and newer blade systems afford us. They are a time and labor saver and let us do things in a hurry that would have required wiring, punch tools and/or solder in days past. In some ways, I miss the old days, but this isn’t not one of them!

NAB Convention

It’s that time again when all the broadcast world descends upon Las Vegas for the annual spring NAB Convention. I had planned to be there, and last fall made reservations and registered for the conference. But alas, while my mind said, “Yes you can!” my body was saying, “No you can’t.” Good sense eventually won out and I cancelled my Las Vegas travel plans for the second year in a row.

I hate not being able to make the trip, but after seven surgeries in the past 15 months and a long road to recovery, I’m still not all the way back. Maybe I won’t ever be, but I do continue to get stronger and improve my range and endurance. I’m good for a mile and a half or so walk now... which is about the distance involved to do the airports on both end and (maybe) the cab queue if I can get an attendant to take notice and let me cut the line. That would leave zero gas in the tank for anything else.

If any of you make the convention and see anything there that I need to know about, drop me a note. Otherwise, I’ll read all about it in the pages of *Radio World*.

The New York Minutes

By

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

Hello to all from Western New York! It was one year ago this month that we had gale force winds rip through Western New York, causing widespread property damage and power outages affecting hundreds of thousands of homes and businesses throughout this part of the state.

In Buffalo, our power was disrupted at the transmitter site only, and our standby generator saved the day by keeping us on the air for the duration of the outage, which lasted over 28 hours.

In Rochester, we did not fare so well. The area of town where our sister station's transmitter site is located was hit exceptionally hard by wind gusts measured at 81 mph, taking down poles and high-voltage lines across the region.

I had an inside contact at R. B. U'Ren (equipment rental company) who managed to provide us with a 50 kW generator that kept both the FM and AM on for over three days! Our small 6,800-watt portable generator kept power on at the Rochester studio location; at least we were able to run NexGen in automation mode until commercial power was restored. Earl Schillinger and Mark Shuttleworth have hooking the generator up at the studio location down to a science, as we have power interruptions at the studio site several times a year.

Also last March, we began our Wheatnet installation and studio remodel in our downtown Buffalo studios. You may recall the numerous setbacks we experienced throughout this renovation, mostly caused by the general contractor. Looking back, it certainly was a learning experience, and one that I personally do not want to repeat anytime soon. The end results were astounding, and the studios look like brand new, even a year later. We are still learning all that Wheatnet can do, and I am thoroughly enjoying making changes on the fly, and not having to rip out and move wiring on punch blocks whenever a change is necessitated.

Operations in our Western New York facilities have been busy of late, engineering wise. In Buffalo at WDCX-FM, we were having problems with the Nautel NV-40 staying on the air in FM + HD mode. If you changed output to FM only, the transmitter would stay on indefinitely, but when the AUI was configured for dual operation (FM + HD), the transmitter would go down with PLL loss and loss of the 10 MHz reference after a while.

Thinking this could possibly be a network issue, I checked all of the network cables and even changed ports in the network switch, but the problem persisted. In order to narrow down the cause of the problem, I switched exciter 2 on the air, and the issue went away. I was able to run the transmitter in dual mode for days without any interruptions or faults showing up on the fault log. This told me that the problem was narrowed down to an exciter "A" issue, so I phoned Nautel tech support to get their input on the problem. I was advised to replace the Exgene board in the exciter; this was in all probability causing the shutdown of the transmitter with PLL and 10 MHz losses. At the time of this writing, I have not received the replacement board, so I will have to fill in the blanks next month on this repair.

The new Omnia.9 audio processor that Brian Kerkan and I installed at the WDCZ 970 site is sounding very good. I am impressed with the clarity and depth of the audio over what we had with the Orban processing. The programming jumps out at you, but not in a bad way. It is hard to describe how much this processor has changed the sound of our station, but the difference is like night and day. Scanning across the dial, we are definitely the brightest and loudest station in Buffalo and surrounding area, even shoving the signal through the bandwidth-limited duplex system! I can't wait to get one of the Omnia.9 processors for our Rochester AM,



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which already sounds good as compared with the other AM's in the market. The Omnia.9 can only enhance and improve an already great sounding station!

We were hoping for an early spring this year, but as Easter rolls around, we are still hearing forecasts with snow and temperatures below freezing. I recently took a trip down to Western Kentucky to visit my parents, and experienced one day of 75-degree weather and sunshine. The remainder of the week was cloudy and chilly with temps in the 40s, and rain. The night before I left to return to Buffalo, you guessed it, it SNOWED! And snow it did. I was well past Cincinnati before I finally ran out of this storm. It was the tail-end of the Nor'easter that was predicted to hammer the east coast cities of Philly, Boston, NY City et al. Fortunately, the storm weakened as it rolled up the Ohio valley and into the Northeast corridor, so the major cities were spared of the predicted several feet of snow.

While traveling down to Kentucky, I had the opportunity to check other radio signals through Pennsylvania, Ohio, Kentucky and Tennessee. I was mostly interested in receiving HD-R signals, and was pleasantly surprised at the number of stations broadcasting in HD, and HD-2. For the most part,

almost all were pretty well time-aligned; only a few were off a couple of milliseconds. The only disparity I noted was the audio level difference between HD-1 and HD-2 signals. A lot of the stations apparently are using non-processed audio, and the levels ranged from nearly identical to 4-5dB down from HD-1 levels. PAD data was another item I noted that there were more HD-1 stations showing program content than HD-2 channels.

I recently heard that nearly 40 percent of all new vehicles sold today have HD-R available in their dashboards! That is up considerably over two years ago, when there were less than 15 percent of new vehicles even offering HD as an option. Only when these receivers start appearing in cheaper model cars will HD-R become a viable media outlet, embraced by the general public. And where are the aftermarket receivers that were promised to appear in Wal-Mart's and other discount outlets across the country? Aside from Crutchfield, are there ANY major distributors handling HD-R capable receivers? Something to think about.

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

The Motown Update

by

**Brian Kerkan, CBTE, CBNT
Chief Engineer, CBC – Detroit**

Spring has sprung in the Motor City. March was a busy month for us. We had a number of projects going on in March, including a new translator for WRDT.

Fortunately, the weather was great for hanging the new antenna. While the tower crew was at work, WMUZ was on the backup transmitter at low power. It was a great opportunity to dig in to our main Nautel transmitter. We were able to clean it from top to bottom.

I obtained my FAA Part 107 remote pilot certificate at the end of the month, and we have received our new Phantom 4 Pro Plus sUAS (drone). Now that the weather has improved, I am looking forward to performing tower surveys at our sites. I might post the 4K video in the

future for the group to look at, which should include guy wire tree clearing that will be performed in the upcoming weeks.



We switched over to fiber for our PRIs, Internet, and all of our codecs here at Radio Place. The service is so much better and consistent. Everything cut over without an issue.

We have been adding new programs to our new station, WMUZ AM 1200 "The Salt." The station has been doing well, and since we rely on our satellite dishes for programming, we took some time to check the alignment of the LNB and dish. This was a

great opportunity to use an SDR dongle and my laptop instead of having to haul out the spectrum analyzer. The solution worked out well.



An SDR dongle and a laptop were used to optimize alignment of our C-band antenna.

With a power-pass/power-block splitter, we were able to take care of the alignment quickly and easily. These SDR dongles are great to have on hand for any application, including backup STL receivers, remote pickup, and off air monitoring. SDR# is a program that can be used with the dongle to act as a receiver with a spectrum display. There is a plug-in for SDR# that will even decode HD radio. Information can be found at <https://github.com/theori-io/nrsc5>, and a link demonstrating its operation at <https://www.youtube.com/watch?v=DVxqVDJc4xo>.

Other uses of the SDR dongle even include return loss measurements using a wide band noise source and a directional coupler. Filters can be checked and tuned, and rough measurements can be performed on antenna systems.

I had purchased an Anritsu 2661B spectrum analyzer at Hamcation three years ago for \$40, and finally got it out to work on it. The power supply was removed from the unit, and I was able to find a replacement on eBay. I ordered it and looked forward to testing the unit, not expecting much. When the supply came in, I installed it and powered it up.

Quickly, I discovered that the LCD was dead and had a bad backlight. This is a common

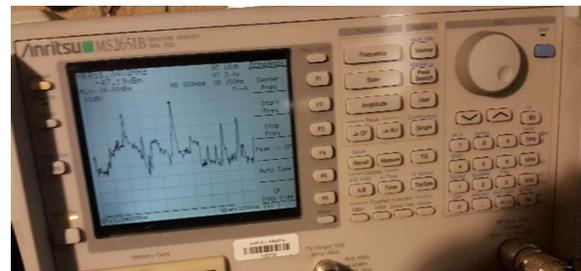
problem with older test equipment that uses CCFL lamps to backlight the LCD. I looked into buying a replacement LCD, but the price was over \$700, so I decided to dig in and explore options to repair the display panel.

Next, I disassembled the LCD frame and LCD, and removed the backlight panel. It consists of a set of diffuser sheets, a clear plastic panel that the CCFL bulb is attached to on the edge. The bulb was burned out and needed replacement. I decided to use white LED strips and a constant current DC-DC buck converter. Once assembled, the panel was reinstalled into the analyzer. I powered it up, and to my surprise, the analyzer booted and passed the self test.

The display is sharp and bright. This 2661B was fully equipped with lab testing options and a tracking generator. I wanted an analyzer with a TG, since I worked with one during my days working with IOT tubes in TV broadcasting.

I went through the menus, and EMC testing options were also present. I have to be honest, I never thought the unit would be working and pass calibration tests!

This will be a nice unit for testing various projects that I get involved with. I am glad I spotted the analyzer under the table, it was one of my better hamfest purchases. I have been looking for a network analyzer as one of my next purchases.



After my "bush repair," the Anritsu 2661B worked good as new!

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

As I write this, my brain is in a fog. The doctor says I must've eaten something that made me sick, and boy, have I ever been. I won't bore you with the details, but having two great assistants like Todd and Jack has been a huge blessing. Nevertheless, I hope that everyone will understand that this might not be the lengthiest column I've ever written.

In other personal news, we've been working on a cash-out refinance on our home. The rates are still low enough that it just made sense. In addition to clearing some old medical bills, we can do a good bit of work to the house. I used one of our good advertisers, Hometown Lenders, and can recommend them highly to any of our other folks in Alabama.

New Transmitter

We have received official word from the shippers: our new Nautel GV3.5 is going to make its way toward us. This is a smaller GV series for the WXJC-FM site in Pumpkin Center, AL. Installing that size of transmitter won't be a big deal. The only logistical kink will be getting the transmitter over that terrible dirt road and into the building. There's a steep hill there that the trucking company probably can't manage. We've asked Danny Dalton, a local who has helped us with other projects, to help with this; if nothing else, he has a Ford tractor with a forklift that can do the job. We expect to receive it sometime the second week of April (target date is the 9th).

Crypto Virus

A couple of weeks ago, the city of Atlanta was reportedly hit by some ransomware – one of those viruses that encrypts the hard drive, then demands payment for the ability to decode the data. According to those same reports, Atlanta had no choice but to pay the ransom.

About a year ago, a similar thing happened to the city of Montgomery, Alabama. They, too, had to pay the ransom to get their data back. As I write this, it has just been reported that Boeing has been

hit. They say that it's only a few systems, but we'll have to wait and see.

All of this underscores two things for me.

First, we have got to emphasize security to all of our employees. Number one, of course, is good backups. For our critical systems, we need off-site backups. We accomplish that by using separate, isolated networks, and the backups are put on hardened Linux systems. Hard drives are so inexpensive nowadays, it just makes sense.

We also have to talk about secure behavior. Someone under pressure to get some work done stops at a coffee shop or in an airport to connect via wireless. They upload files and check email. The latter is the biggest vector for ransomware: an innocuous-looking message, from a known and trusted contact, has a link or an attachment that will install the ransomware. The virus then works in the background for some time (days, weeks), until it finally “triggers.” The ransom notices appear and your hard drive is inaccessible.

Being security-aware is a pain in the rump, but we have to emphasize this. Backups can take many hours, and given the size of our databases nowadays, there may be some downtime. It's inconvenient to only use good, strong passwords, and *always use a different password for each site or application*. Having to remember a bunch of cryptic-looking passwords is no fun, but it's essential. Refusing to connect to a poorly-secured wireless network is also something that is very tempting when you're under a tight schedule, but it's another common attack vector. If nothing else, they can watch you log in to your email account and could crack the password. Later, they'll use your account to send out spam and malware. *You* will become the “trusted contact” that sends the virus to someone *else*.

The second thing, which I've discussed with Cris, is that we make sure that all of our sites have at least a good ClearOS installation between the Internet and the employees. If that doesn't work, we may have to consider a commercial solution like one of Barracuda's firewalls. This is not foolproof, though.



If the virus is too new to be recognized by the blocking software in the firewall, it could get through and cause damage.

So, all we can do is what we can do. We start with several backups, offsite. We use good passwords. Don't connect to a poorly-secured wireless network. If the password is posted for everyone in the coffee shop or doctor's office, that's not secure. If your device doesn't say that the wireless is using "WPA2" security, it's not safe. Next, we should be careful about what we permit to come in from home. Many viruses have been spread via infected disks and thumb drives carried in by employees.

Again: all we can do is what we can do.

A/C Woes

Alabama is hard on air conditioning. Always has been, always will be. One day it'll be hot; the next, cool. Once it turns hot for the summer, that A/C is likely to be running for months straight without a break.

We've had problems (again) with the rooftop units at our 120 Summit studios and offices. When we built out the new studios over a decade ago, we upgraded to one of those fancy computer-

controlled zone systems. Whenever we have a problem, as often as not, the A/C technicians will put the issue on the control system, and vice versa. The important thing is, as I write this, at least it's still working. For now.

WDJC's transmitter site A/C unit suffered a shorted compressor several weeks ago. Replacing it seemed to fix the problem, but the breaker began tripping. I investigated that one and determined that the badly-shorted compressor (and let's be honest, our repeated attempts to reset the breaker) damaged the circuit breaker so that it went "soft." In other words, instead of holding its rated current, it would trip at a small fraction of that. Another clue, if you suspect this, is that the breaker will be running very warm to the touch.

The good news is, replacing the breaker solved the problem. We also had to replace a short run of #8 wire from the breaker to the A/C unit. It had gotten so hot that the insulation had melted. The wire was touching the cabinet.

Hopefully, we'll have lots of photos of the new transmitter at WXJC-FM next time, as well as the other odds and ends. Until then, keep praying for this nation.

The Chicago Chronicles

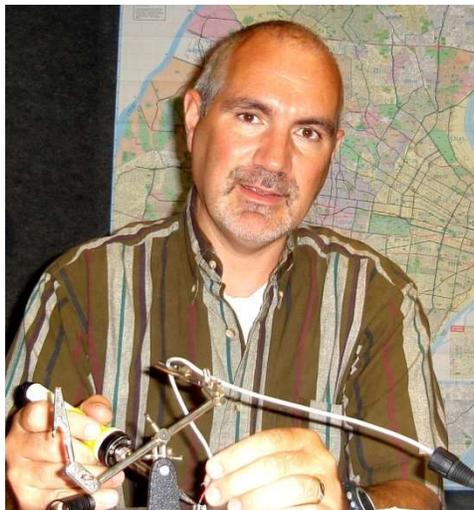
by

Rick Sewell, CSRE, CBNT, AMD
Engineering Manager, CBC-Chicago

GV5 Touchscreen Update

Last month I wrote about the installation of the new Nautel GV5 transmitter at the WSRB transmitter site. In that article, I explained how great the transmitter was with the exception of the touchscreen. It would basically make moves on its own, including turning the transmitter off. It was far too sensitive and was actually responding to the air conditioning blowing on it about five feet away.

I had reported that Nautel sent us a new touchscreen monitor just before press time, and that this seemed to cure the issue.



However, after a few days the problem again occurred. While we didn't get a turn-off event, I found the popup menu on the screen trying to change the language from English to Spanish. It's been awhile since I took Spanish in high school, so I didn't need that to happen. We also noticed that it would not go into screensaver mode; it would go dark for two seconds and then come back on. All this was happening *without* the air conditioning blowing on it.

After reporting to Nautel that the issue was still happening, they went back to the drawing board to fix the issue. Finding

the same thing happening on the test floor, they redesigned the brackets and mounting system to take pressure off the touchscreen. The touchscreen works on a sonic wave, and just like your phone or tablet, if you have your thumb pressing the screen and try to control it with your finger, you probably will get unexpected results. The working solution was to get as much pressure off the points where the brackets touched the screen. This also included a newly designed bezel that had longer screw mounts so that it is now slightly further from the screen when mounted correctly. It is hardly noticeable from the front of the transmitter, so it didn't change the look of the transmitter.

When we got the new mounting system, we immediately took it to the site and remounted the touchscreen monitor with the new brackets and bezel. We reconnected the serial control cable again (I had unplugged this to keep accidental turn-offs from happening). We used our stopwatch to see if it would go to screensaver properly in the ten-minute period; it didn't happen. This time, it wasn't even going dark for two seconds. What we did notice is that the cursor was moving around by itself. While it wasn't opening menus, it was keeping it from going to screensaver.

I decided to take my chances and leave the serial control cable plugged into the monitor and see what would happen, but I wasn't encouraged by the screensaver never coming on. The next day I came in and found the popup menu on the screen trying to manually change the power level. Fortunately, it

wasn't successful. However, I realized the serial cable had to come off.

Once again, I reported my findings back to Nautel. They sent us various things to try, and one of them was to replace the current (replacement) touchscreen with the one that came originally with the transmitter when it was shipped. To be honest, I thought this was a waste of time, since we already saw that the touchscreen had issues right after installation. However, I decided to go through the motions and just do it so that we could get beyond that suggestion and they could come up with the next cure for the problem. Once we replaced the monitor with the original touchscreen and re-calibrated the screen, I also followed their suggestion to pull the power on the monitor and do the calibration a second time.

Once all that was done, we immediately noticed that the cursor was no longer moving by itself. And at ten minutes, it went to screensaver and stayed in screensaver mode. We went through several cycles of touching the screen to get it back in and out of the screensaver. Each time it behaved exactly as it should.

We came back to the site a few hours later and noticed the monitor was still in screensaver mode and it responded as it should once again. Being a little jaded, I came back again the next day and all was still good. It's been a week now since the replacement, and we are fairly confident the new mounts, with a touchscreen that isn't quite so sensitive, solved the issue.

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

That old saying that March comes in like a lion came to mind this year with hints of spring to come. And then along came the predictions of snow above 500 feet. But wait a few minutes and we get yet different weather. Oh well, one thing that is predictable in the Northwest is *wet*.



So for something mundane, a delivery van knocked over the KKPZ mailbox. Closer inspection revealed the original installation had used a base of indoor-rated particle board. Remember what I said above: the Northwest is *wet*. So the base was highly deteriorated when struck by the van. Of course, a

non-standard post was used, which complicated the repair.

One goal I have, and it's a strange one, is to be able to report that nothing much interesting happened last month. Now there isn't much chance of that happening. Still...

March marked the release of the "EARTHQUAKE REGIONAL IMPACT ANALYSIS FOR CLACKAMAS, MULTNOMAH, AND WASHINGTON COUNTIES, OREGON." The report, generated by the Oregon Department of Geology and Mineral Industries (ODGMI), is eye opening. According to the summary:

"The Portland metropolitan region is vulnerable to regional and local earthquakes. [ODGMI] modeled damage for two earthquake scenarios: a magnitude 9.0 [Cascadia Subduction Zone] earthquake, and a magnitude 6.8 Portland Hills fault earthquake, a local crustal fault situated at the foot of the Tualatin Mountains."

"In order to better understand the range of possible losses, [ODGMI] analysis quantified impacts during saturated and dry soil conditions – the former are more likely to have earthquake-induced landslides and liquefaction; the latter may have some earthquake-induced landslides, but little occurrence of liquefaction."

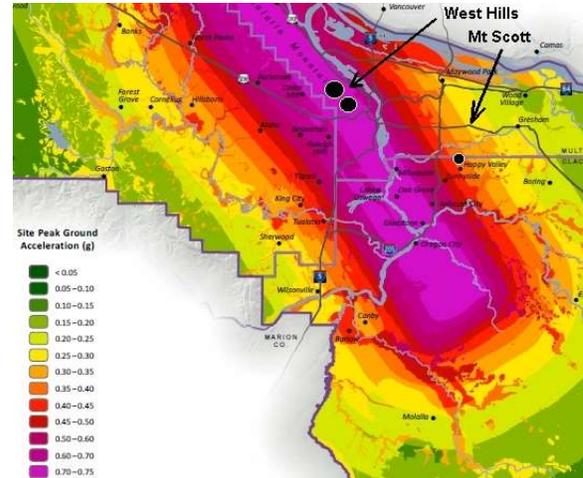
The summary concluded: "A Cascadia Subduction Zone (CSZ) magnitude 9.0 earthquake will have a severe impact on the three-county area, with building repair costs amounting to between 23.5 and 36.7 billion dollars (9% and 14% of the total building replacement cost... Although damage estimates vary widely throughout the study area, no community will be unharmed. Depending on the time of day an earthquake occurs, casualties may be in the thousands or low tens of thousands."

All of that is alarming enough; the earthquake damage maps indicate damage to a large segment of the local broadcast infrastructure. As shown in the map, the existing metro TV and FM infrastructure is located in Portland's west hills, the very area most susceptible to earthquake damage. The map shows significant ground accelerations of .75 Gs for these facilities. The Mt. Scott facilities fare much better with ground accelerations of .4 Gs.

After this latest earthquake bad news comes good news included in the budget-busting appropriations bill. Randy Stine reported in the CommLawCenter newsletter:

"Tucked within that spending bill signed by Pres. Donald Trump last week is a requirement that

broadcasters be allowed access to disaster areas in order to maintain facilities during times of emergency. Several graphs from the 2,232-page federal appropriations document spell out



Map of predicted earthquake damage.

amendments to the 'Robert T. Stafford Relief and Emergency Assistance Act' that updates the definition of 'essential service providers' who have access to disaster areas during federally declared emergencies... Mobile telephone service, internet access service, radio or television broadcasting, cable service, or direct broadcast satellite service" are now considered essential service providers, according to the document, thus allowing them to gain access to vital infrastructure, including transmitter sites, when disaster hits."

My take is this is good for the public during an emergency and does not displace the need for local broadcast engineer credentials. The new federal changes will nicely supplement local engineer credential programs. One weakness of any local- or state-level credential program has been a lack of recognition at the federal level. When the President issues a declaration of disaster, responders work under federal rules, which in the past could overrule local and state credential programs.

The good news here is twofold: First, local broadcasters, which are critical resources, are now clearly delineated at both the local and federal levels. And second, broadcasting is listed as a critical infrastructure. This change ought to dovetail nicely with existing local and state credentialing programs.

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

Tower Work

We did indeed get the tower work done at KLTT at long last. It was a day of climbing for Derek Jackson of Today Works. He started the day off climbing two of the shorter KLVZ-night towers to check on those lightning rods. They are clearly angling outward and we weren't sure if they were loose or not. Thankfully, all was tight. Maybe a bird or many birds have whacked into them over the years causing them to be like that. He said that one of the top plates was actually bent as a result. At KLTT, he was able to drill a bigger hole in the top plate and secure the new lightning rod. I do believe that all of the towers in Denver now have secured lightning rods.



NexGen Replacement Computers

As mentioned last month, we decided it was time to replace the DRR machine in Denver. It was running XP and had some old Audio Science soundcards that were not compatible with any later operating system. We purchased a new Wheatstone Blade-3 and a new Dell Precision 3620 computer. We figured this would be easy. I pulled out the documentation for setting the computer up that's in our Wheatstone guide and began going through the process. I got everything done, and the blade was in and ready to go, but we found the computer was not seeing the audio.

I called RCS and had some difficulties finding the right person to help. One person blamed us for the audio issue, despite the fact the audio was showing up on the recording device in Windows (it was getting to the computer). I called back and got someone else on the phone, and she proved to be a huge help. She got the RCS cheat tool that bypasses having me go through and make all the necessary changes within Windows, things like NIC power

management, Windows time and so much more. This tool is amazing. She fought with that machine for a long while, but she found the issue and got audio to the recording devices. We ran several tests and verified things worked.

I left the computer alone for a couple weeks, and on a Friday afternoon, I was told the DRR recordings had been off by four seconds since we installed it. First off, thank you for telling me this two weeks later! Second, I should have

remembered to never do a reboot of a critical machine on a Friday! I rebooted the computer after I once again called RCS and had the tech on the phone tell me it was a Windows issue, that we had another program causing the issue – another program on the computer that RCS set up for me. Of course, nothing was installed that wasn't supposed to be.

So I decided to do the reboot because, when in doubt, reboot. This fixed the issue. Go figure. It wasn't another program causing the problem because there was no other program to cause the time issue. All seemed well. I asked one particular operator that had a recording coming up to let me know if there were any issues with it. Nothing was heard, so I left for the day.

That night, as I was driving with my husband to our mountain cabin to do some much-needed work, I got several texts that the DRRs were not recording. Apparently, they hadn't been since the reboot. Apparently, communication is our business, not our policy! No doubt in my mind this is an issue everywhere.

I couldn't do much until I got to our cabin, but once there, I got on my laptop and began digging into it. Once again, I could see audio in Wheatnet and on the computer itself, but nothing in NexGen. I called RCS and got another tech on the phone. She worked with me for an hour and a half, but finally got it all working.

As it turns out, Windows 10 knows better than I do what I want. When rebooted, it moved the device mappings around, causing the issue. She found out how to properly put in this info into the wizard.ini file, and once we got things working, we quickly locked down that file so it could not change. I have not done another reboot since, but this is a machine that doesn't need rebooting often. Two weeks later, it's still working fine.

During all this, we also had another machine die. Our control room 3 (KLVZ) computer died. I could not get it past the Windows splash screen. Thankfully, this station is all music and there was nothing live in there. However, we do have client recordings each week that had to be moved.

Instead of moving a production computer to the room, I decided to wait. We ordered a new computer from Dell, and it came in quickly. Setting up this computer worked much like the DRR. Things on my end went fast. Getting audio to from the computer, on the other hand, wasn't as easy. Windows 10... need I say more? I worked with the same tech as with the DRR, and she got things working fast. The only issue we had left to solve was recording into Adobe Audition. It would record; however, it would rhythmically pause the recording, almost like a stutter, despite the input audio being perfect (audio-silence-audio-silence...). We put off fixing it for a bit so we could get that room up and running.

Later on, someone came and told me all the audio was "slowed down." It was an odd sound, pitched low, like an old vinyl record on too slow a speed. I found a song in our system by Skillet and played it over and over again. If there's one thing I know, it's how a Skillet song should sound, and it did not sound like Skillet. Once again, I called RCS and got a tech on the phone who blamed Windows and once again would not help. I asked for another tech specifically because he had tried to fix Audition for us with no luck. I thought maybe he had changed some stuff. When he was busy helping out someone else, I called one of the nice techs back who had helped earlier in the day.

She got on there and starting digging around. She wasn't having any luck, but I think between my dad and me, we had determined it was a sample rate issue. The question was, where? While the tech was looking through the various configuration files, we looked on another computer

and found where you could select the sample rate in Windows. We changed them to the correct value for each recording device and things started working. I quickly ran away before anything else could happen, vowing not to mess with the computer again since the next day was Friday.

That night, after waking up way too early due to my brain working on problems without me, I thought to myself, maybe the Adobe Audition recording is working now that the sample rate is correct. So I went against my own advice and looked at it on a Friday. Thank goodness the recording worked perfectly in Audition and I didn't have to actually mess with anything!

This whole process has been a learning experience. Windows 10 is not very nice in some respects, and you need to lock down those wizard.ini files on your various computers. While it makes it inconvenient to make configuration changes, it keeps Windows from making changes on its own.

I am forever grateful to the two Jennifers and to Phil at RCS, who spent countless hours helping us get our two computers working properly. They were patient and informative and they realized that I actually do know what I am doing and didn't treat me like an idiot. Any time I call, I am always going to try to get one of them on the phone. At least that way I don't have to worry about it being a mysterious Windows issue.

NX-50 Engine

On the 20th, I got a call from the operations manager at KLTT, asking me if KLTT was off air. I guess he was having a hard time hearing it in the studio. I looked and found the microwave link down. I had him put the station on ISDN while I did the reboot of the microwave. It came up with no issues; however, I noticed KLTT was only in analog – there was no HD.

My first thought was that the exporter froze. I switched to the aux transmitter, which also has HD but I quickly noticed the main transmitter stayed on and at high power. We have a huge dummy load in the back room with a large fan that blows to cool it, but you have to manually turn the fan on. This keeps it from overheating with 50 kW going into it. This was a weird issue, and since I had the other issue, I decided to head out there with my dad. I was confident it was a power failure that helped cause the issues, and that was confirmed when we saw some



Clearly, the fire started when sparks from this utility pole fell into the dry grass below, and it ran downwind from there to burn a good-sized area.

electric company trucks parked near the site with crews doing some work. It looked like they were installing something, and most likely had to interrupt power.

Once at the site, we found the interlock issue was merely a jumper wire. We had bypassed the interlock back in January so we could replace those slave relay boards at the tower bases. I guess we must have forgotten to remove the bypass wire in the transmitter. Thankfully, that was an easy fix. The other issue we found was the engine. While I know

the power failure probably did not fry it, perhaps it just caused it to finally hit one too many reboot cycles.

We got the new engine in and installed it rather easily. It can be hit or miss with how the process can go. Thankfully, Nautel had called and verified some information to be sure to get the right version on the engine. We installed it, plugged it in, turned on the transmitter, and it was a beautiful thing. Only had to change up the various IP addresses needed along with the mag delay value. We put power to it and had HD. I love it when things come together so easily. Especially after all the NexGen computer issues.

Fire

We did have a grass fire at the KLZ transmitter site last month. Keith was going out to the site to get the cracked fuel hose from the generator so he could have a replacement made. As he arrived, he noticed some smoke starting up and found that part of the antenna field was on fire. He and a neighbor were able to get the fire out quickly. It appears an insulator on a power pole on the property broke in the wind, causing a spark. Some embers clearly landed on the grass and caused the fire. We were able to get the electric company out rather quickly and get it repaired. If Keith had not been there when he was, there's no telling how bad it could've gotten.

Spring

It is officially spring. Now in Colorado, the first day of spring and the fact that it is spring doesn't mean it really is spring. This is the time of year we have extremely bipolar weather. Just the other day, we had snow. It was heavy, causing satellite issues because of how heavy and wet it was. The next day, it was warm with bright sunshine.

As we do transition to spring, this will bring other issues. Storms tend to knock the microwave link out at KLTT. We have never been able to figure that out, but we are able to deal with it easily. The grass is also beginning to green up, which means mowing season will begin soon enough.

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

The Local Oscillator
April 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/107.1 MHz, 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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