The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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What a year this has been. No, seriously. The highs have been higher and the lows have been lower than any other period in my lifetime. The pandemic has, of course, been the underlying factor, changing the way we work and prioritize. It has certainly turned my professional world upside down, and yet the show must go on.

For all practical purposes, we took the first half of this year off with respect to scheduled projects. That has resulted in those projects being pushed to the fourth quarter and crowding year-end. They are also crowding the arrival of winter (he said on this October day, looking out the window at the snowy landscape with an outdoor temperature of 7 degrees F), and that presents additional challenges. In some parts of the country, that doesn't matter so much, but in most places, it's a show-stopper for outdoor projects.

In late September, as chronicled in last month's issue, we started on the long-delayed Cambium microwave project in Denver and Birmingham. We wrapped that up in October and have a few things to share about the project later in these pages.

We have also been making preparations in Denver and Birmingham for The Big Wheatnet-IP Project™, which is coming at us like a runaway train this month. In both markets it involves replacement of the 2004-vintage Bridge Router TDM system, including G6 on-air consoles. We already have Wheatnet infrastructure in these markets with production rooms and Nexgen, but this project will make both facilities 100% Wheatnet.

In recent months, we have seen up close and personal the advantages of this infrastructure during last spring's COVID lockdown – KBRT is all-Wheatnet and that allowed us to operate our radio station remotely in a way that we couldn't have dreamed of just a few years ago. That has to be the model for any of our infrastructure going forward. We live in a different world today. To punctuate this, as I write this, we just got word that here in the Denver metro area, restrictions are going back in place because of increased infection rates and outbreaks. It wouldn't surprise me if we don't see this nationwide as we head into the holidays.

There are many facets to this omnibus project in each of these markets, and the devil is in the details. One detail that Amanda has been working on is how to get Nexgen to route sources to destinations in Wheatnet so that the Nexgen DRR (multichannel auto-record utility) can automatically select the desired source when a recording is started. We knew that Nexgen could control "salvos" in Wheatnet as we had used them for some time in other applications, such as simulcast, EAS and the like. But making this happen in a DRR application where we have up to four channels of simultaneous recordings of various things was not an easy thing to figure out. But figure it out she did, and we're now good to go to move even DRR to the Wheatnet environment.

Other details include all the system sources and destinations that must be brought into Wheatnet

during the transition so that the hits can keep on playing. Satellite feeds, off-air monitor feeds and audio chain exports will have to be created in the Wheatnet system as we make the move. I was explaining all this to Mike Cary and he observed that it's like changing a tire while the car is moving. That's a great description, and it well illustrates the challenges!

All Digital AM

It has been interesting to see the reactions of engineers across the industry to last month's FCC rulemaking permitting M-3 all-digital transmissions on AM stations. Many are applauding the action while others are saying, "There goes AM, the final nail in the coffin."

We as a company are generally pleased with this new *option*. I emphasize *option* because all-digital operation is voluntary, not required. It's not a good fit for many or even most, but it will permit those for whom it is a good fit to make the move. The FCC put a 30-day "waiting period" into the order, which makes a lot of sense. Hopefully, most of the stations making the move would not throw the all-digital switch without giving their audiences plenty of notice, but in at least one test case, listeners were surprised when the analog signal went away and the licensee turned the analog back on. The mandatory waiting period and notice to listeners should eliminate the surprise.

Other elements of the all-digital order are:

- Nominal power – the average power of all the digital signal will be used to determine whether the station is complying with its licensed nominal power.
- Spectral limits – the existing spectral limits contained in §73.44 will apply.
- Power measurements – licensees can use "any reliable and reasonably accurate method" to measure operating power.
- Digital subcarriers – as long as at least one free over-the-air digital programming stream that is comparable to or better in quality than a standard analog broadcast, licensees are free to use their excess bitrate capacity for either broadcast or non-broadcast services.
- Carrier frequency tolerance – will remain at ±20 Hz.
- Interference – in the unlikely event that all-digital operation causes prohibited interference, licensees will be expected to work our interference issues among themselves, with a remediation procedure to follow in the event that they cannot.
- Nighttime operation – 24-hour all-digital operation is permitted.
- EAS – all-digital stations must participate in EAS.

So what does this mean for Crawford AM stations? In the short term, not much. I don't anticipate converting any of our AM stations to all-digital anytime soon. We simply have too much going on, and the decision to convert will require much analysis and thought.

That said, we do have some candidates within our company that we will *consider* for all-digital operation, stations that have 100% FM duplication. Those stations are already operating in the hybrid mode, so we have equipment in place that will permit all-digital operation and no additional investment will be required. Once we get through the current wave of projects, we'll start looking at our options.

The new rules likely won't go into effect until next year in any event, 30 days after publication in the Federal Register, and my guess is that publication won't happen in 2020. Maybe that's a good thing.

Stay well!

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

Hello to all from Western New York! Where did the time go? November is here, the first snowfall for Western New York is forecast for November 1st. And I still have winterization duties to tend to at our transmitter sites!

I do not recall ever experiencing a year like 2020. It appears that everything has been turned upside down, inside out, and on its side. Time either accelerates at unprecedented speeds or slows down to a minute crawl, with no signs of the normal we have previously known. This year will definitely go down as one nobody will ever forget, and I pray that in 2021 we can get back on track and return to business as usual.

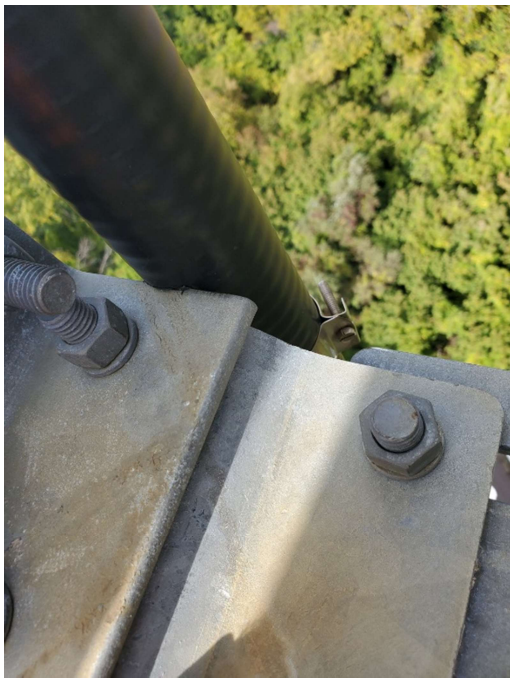
In last month's report, I mentioned the issues we were experiencing with the WLGZ transmitter site in Rochester. The line impedance was all over the place, causing the transmitter to fold-back power. On Monday October 5th, Steven Steele of Patriot Tower inspected the feedline and found that there was significant damage to the line from the input of the antenna to nearly 60 feet down the tower. This damage was due to someone cutting the butterfly mounts that secure the feedline to the tower leg, and the wind and gravity took care of the rest.

Steven noted that there was another 2-1/4" line running adjacent to ours that had been cut clean through about 70 feet down from the point that the butterfly mounts were cut on our line, indicating that our line was in all probability mis-identified as the one that was to be removed. We have no way of knowing who or when this was done, and noting the amount of damage that was done, we have no other choice than to replace the 300-foot run from the transmitter building to the panel antenna.

As of this writing, the new line, connectors, mounts and hoisting grips are at Patriot Tower, waiting to be installed. I spoke with the crew chief on Thursday 10/29, and he indicated that the work may be completed as soon as the end of the 1st week of November, weather permitting.

Steven provided several pictures from his initial inspection on the 5th, showing many spots where the bare copper was exposed from beating against the tower leg from the wind, and most notably, a severe kink in the line where a dish mount had dug into and through the outer conductor, causing an opening that in all probability is allowing water to enter the coax.

This site is owned and maintained by American Tower Corporation, and we are only one of many tenants



A bracket has rubbed a hole in the WLGZ-FM transmission line.

on the tower, so we have no way of controlling or knowing who is performing work on the tower at any given time. There are as many as a dozen different tower contractors who are ATC approved that have performed work on this site over the past year, so identifying the culprit who caused this would be all but impossible.

Also in Rochester, at our WDCX(AM) transmitter site, sometime within the past month, someone entered the property and cut several of the chains securing the gates at towers two and six. Matt Huber, our mowing contractor, was finishing up the fall mowing and was trimming around the tuning houses and noticed that the gates were wide open. He looked around the fencing surrounding the towers, but was unable to locate the missing locks/chains. He sent photos via text alerting me of the issue, and the next day I purchased new locks and heavy-duty chains to replace the missing hardware.

A thorough inspection of the towers revealed no damage to our property. The ground straps were all intact, so I have no clue as to why someone would do this. Perhaps at that time they were only scoping out what was there, with intentions of returning later to harvest the 4-inch copper ground strapping. Good luck trying to cut through the new chains! They are the heaviest, thickest chain I could find. In fact, it took me almost a half hour with a grinder to cut through a link to make the correct length of chain.

The frequency change of the Nautel ND-5 we purchased from WDCD in Albany continues. I worked overnight Monday the 26th attempting to get the output network to the proper impedance for operation on 990, making little to no progress. There are two coils in the output network that have to be set to 12.75 ohms, measured at the output of the combiner. The issue is, the clips that attach to the coils are half-round fitted connections, and after attaching and removing them several times, they become loose and will not stay in place long enough to make a measurement with the vector impedance meter.

I phoned Nautel to speak with Steve Braley, the resident "know-all" guru for frequency changes on the ND-5 to see if he could provide any "tips" or secrets that would aid in getting this accomplished, only to find that he is on medical leave until sometime in early December. Apparently, he is the only one at Nautel that is familiar with this process. I know that there are a number of engineering professionals outside our company that read the Local Oscillator monthly, so if there is anyone out there that has performed a frequency change on a ND series Nautel transmitter that could share tips/suggestions, please reach out to me! I might even through in a new coffee mug and station "T" for your help!

That about wraps up another month here in the great northeast, and until we meet again here in the pages of *The Local Oscillator*, stay safe, social distance, and happy engineering!

The Motown Update
by
Mike Kernen
Chief Engineer, CBC–Detroit

Like a scene from the infamous Hoarders TV show, the entrance to the transmitter site appeared as the unpainted steel door swung open. Inside was the time-locked bevy of everything that came before. Before Crawford and since. This was my first visit to the AM560 site since I had worked for the station's former owner.

AM560 was constructed in 1955 and went on-air in '56. WMIC, owned by McIntyre Broadcasting (a reference to the owner's Gaelic Mc surname prefix, possibly?) was a 500 watt DA daytimer whose northern lobe was a rimshot into the Detroit market from the distant town of Monroe to its south.

It seems fitting that the 21 years of AM560's programming history was filled with music from that era; the time of "Golden Oldies." When it was known as WHND and HoneyRadio, it was owned and operated by Greater Media (from '73), where I happened to have worked for nearly 30 years. I had

only visited Honey one time before it fell from Greater Media's good graces and was LMA'd a la Espanyol for a time before being sold to Crawford in '97. Sold, but not before Greater Media parked their reviled competitor's iconic WLLZ call letters there just to keep them from ever going back into service as WRIF's chief competitor, 98.7 Detroit's "Wheels."

As it is with most things old and remote, it is tough enough to keep them in usable condition, never

A 56AM "Honey Radio" billboard circa 1987. Photo courtesy of Jeff Feldmeier.

mind clean, organized, well maintained, and finely tuned. It now being my responsibility, my objective is to restore it to a reasonable condition free of the mountains of junk, useless technology, decay, and rubbish.

Vegetation and nature have also taken over the whole site. The tower 3 base fence could not be opened because too much earth had been piled in front of its gate. Tower 2 required a harrowing walk, Indiana Jones style, through the tall grasses just to come foot to foot with giant gopher holes. Access to the generator shed and to tower 4's enclosure required a chainsaw (and a backache). I didn't dare drive out there lest my truck set the field ablaze!

The 1,300 square foot transmitter building had been home to a small business office and two studios, one of which was still powered on. Though the mics and monitor speakers had been removed, you could still switch off the STL and play *Hot Rod Lincoln* on-air from a waiting ITC triple-decker cart machine.

I found at least a two-dozen unused pieces of equipment still powered up, many no longer connected to anything! Amazingly, the office's old 1A2 key phone system remained powered on with its music on hold radio still pointlessly feeding AM560 to its MOH input. Micky D bags, newspapers, and Styrofoam cups… anything old went there to die. The window curtains and broken glass littered the floors, every horizontal surface was piled high, and tarps covered the plastic windows.

Homebrew inventions lurked in every rack, and wires were run over the floor. At least one could avail themselves of the facilities if they didn't mind using a grimy broken toilet in one room and washing up in the other. I'm told a 40-yard dumpster had already been taken; filled with debris from inside the transmitter building.

Another 30-yard dumpster was filled and taken away the last week of October. Our friendly consultant relieved us of a Harris MW1A and lots of other old gear with a promise to take any more stuff we uncover.

We unloaded the tuning houses' antique equipment racks, and I even surprised our business manager with $107.37 in petty cash that'd been hidden away since 1993! The bathroom now has working fixtures, and the vegetation work is well underway. Clutter control is mostly complete, floors are clear, and tabletops are now clean and without Big Mac wrappers.

This is not meant to impugn any of my predecessors. A mess like this builds up slowly and sometimes isn't so evident except to a new set of eyes.

Set nearly 50 miles removed from our normal workplace, it takes concentrated effort to eat away at it and to keep momentum once you get a project like this started. Keeping it this way won't be too hard. I've bought a garbage can and I'm not afraid to use it!

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

Hey, let's do something different: we'll start with the weather! As I write this, Alabama is about to be hit by yet still another tropical storm. Poor Louisiana will get the worst of it (again), but Zeta is moving so quickly, it's supposed to be in the Birmingham area as a tropical storm later this evening. The generators are fueled and ready, and we're praying that all goes well. But seriously. I've had enough of tropical systems.

Another Dead Barracuda

Our Barracuda Spam Firewall has been performing normally for some time now, so we didn't expect it to just up and die a few days ago. Todd happened to be at the studios (I was at a transmitter site), hooked up a monitor, and saw a screen that said, "Hard Drive I/O Error." Manifestly ungood.

Fortunately, we have a so-called "Instant Replacement" plan with Barracuda Networks, so they overnighted a replacement unit to us. In the meantime, Todd, being a bulldog, allowed Barracuda Networks to remotely rebuild the old firewall. He then installed a backup of our settings, and we at least had some SPAM protection overnight. The next day, the new unit arrived. Todd set it up offline, then swapped it into place. The old unit will go back to Barracuda.

I put "Instant Replacement" in quotes because, while overnight is certainly quite fast as these things go, it's not exactly "instant." I'm glad Todd was able to at least get the old Barracuda to limp along. The last time this happened, we were hit with Brobdingnagian amounts of SPAM. I've said this here before: most of our users have no idea how much SPAM that thing stops. When you see a few "Tactical Flashlight" or "Health Care Plan" emails sneak into your inbox, rest assured: that's the very tippy-tip of the iceberg. Barracuda stops most of it before you ever even see it.

It would be nice if Barracuda Networks would offer a scheduled replacement plan – say, every 3-5 years, automatically – rather than allow our old unit to die, then wait for a new one. But hey; I guess I'm very grateful for what we've got.

A New Network

Those of you who live in other parts of the USA have no idea how good you've got it for high-speed Internet access. I'm not talking about remote transmitter sites; that can be a problem if you don't have a good shot/path for a microwave link. I'm talking about studios and offices. Our building at 120 Summit Parkway in Homewood (suburban Birmingham) only got fiber a few years ago, and it was topped out at 20 megabits.

Like all y'all (a little Southern lingo for you there), we have a bunch of people working from home because of the COVID-19 pandemic. That takes bandwidth. Add in the fact that we do remote

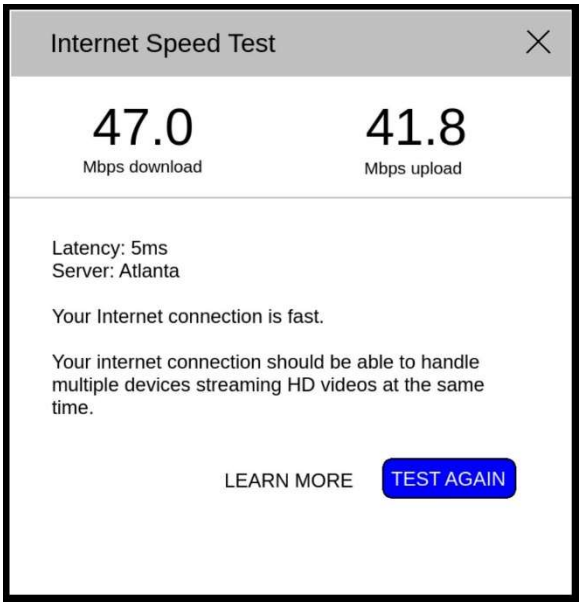


Figure 1 - This is actually fast for Alabama (sigh).

control and administration, plus run our email server on that same connection, and you can see that we can easily choke out that 20 megabits in short order.

Frank Franciosi and Brett Larson have been requesting more bandwidth for some time. After talking it over with Cris, Corporate graciously agreed to a perfect solution: a separate Spectrum 200 Mb service for office access, and a new, upgraded 50 Mb fiber link from AireSpring for the mail server and remote administration.

We're even getting close to the advertised speeds, which isn't always guaranteed (see Figure 1; Todd ran a speed test on the new AireSpring access). The Spectrum service was installed a few weeks ago; the AireSpring was finished today (Wednesday, October 28) in spite of the fact that a hurricane was approaching!I still need to get out a memo to everyone that this does not mean that all employees can watch videos and sporting events at their desks. 200 megabits sounds like a lot, but YouTubing and streaming can eat that up in a hurry. Ask me how I know ...

Corrosion

It's very humid in Alabama. I mean, like, really, really humid. It doesn't help that we've had three tropical systems and one frontal system after another keeping us saturated and foggy. There's also some kind of black crud in the air (coal dust?) that manages to get into and onto everything. Those who own large commercial buildings actually pay people to come steam and spray-clean their facilities every few years or so. Otherwise, they start looking kind of nasty.

Figure 2 - Time to do some scraping and cleaning.

While doing routine maintenance at the 101.1 FM site (WXJC-FM) in Cullman, I opened the old BE FM-30T aux transmitter for some cleaning and a check out. That's when I noticed some rather gnarly-looking corrosion in a few spots (see Figure 2). Once these endless storms finally get tired of making us wet, I've got some cleaning and scraping to do.

Odds and Ends

Coming up – again, delayed by rain – we need to look at cutting weeds and filling in the roads to our transmitter sites. The ones at 101.1 and 92.5 are especially bad. At 92.5 (WYDE-FM), there's a dip in the drive where rainwater just gathers and then runs off to either side. I've got about 6-12" of clearance to either side with my big F150. That's a little close for comfort. On both sides of the road, there's a drop of several feet. No doubt the bushes would catch me, but ... you know.

Cris had some trouble with a microwave link in Denver (he mentioned this in the last issue). I had similar trouble (also mentioned in the last issue) at 1260 AM (WYDE). His solution was to use a better power supply. I installed a Cambium PoE injector and suppressor at the transmitter site, along with a good indoor-type TDK power supply, and my problem cleared up.

Still more work to do there (when isn't there?). I want to get the CAT5 cables into conduit. The RF at 1260 is amazingly bad. Years ago, in an attempt to eliminate RF in the phone line, I wrapped the phone cable several turns around a spare Nautel toroid. The toroid shattered within a matter of minutes. That kind of spooked me. I've already got the power supply and injector in a shielded cage; I posted a picture of that last time.

I've also been working on the gates at both 101 and 850. The gate at 101 was damaged a while back by someone – it looks like a truck ran into it. "Well, duh, I fergot to unlock it, hilk, hilk!" (Not me. Not sure who it was.) Thanks to ground with the consistency of modeling clay, the new posts that we put in a few years ago at 850 have already tilted. This is a mistake that I made when we were rebuilding the site in 1999: the local contractor asked if we could just use one wide gate instead of two narrow gates, and I said, "why not?" Well, now I know why not: unless I should install a concrete anchor worthy of a 300-foot tower, anything that you put in the ground to serve as a mounting pole is going to lean eventually.

Todd and Jack have been doing their most

excellent jobs looking after the studios while I run to transmitter sites, cleaning, fixing and taking care of stuff that has been pushed to the side for much too long. (Between storms, as mentioned above. And in every issue of the LO, for that matter.) They're the two best engineering assistants in radio.

Finally: VOTE!

Don't believe the polls. Period. Folks, the mainstream media is pathetically corrupt. Witness their refusal to mention the growing scandal surrounding Hunter Biden and the Biden family's money-laundering scheme. I am sickened when I think about it – even assuming that only 1/3 of what's being reported by a few honest media, it's really bad.

Apparently, most polling organizations are in the tank as well, even the one that Fox News uses. I just don't believe them. Trump can do a rally in the middle of nowhere and draw tens of thousands of people. It's a repeat of 2016, only better. I believe he's going to win more electoral votes, personally. But I'm not taking anything for granted. I'm going to the polls to vote. You do the same!

A final picture for you (Figure 3): the newest member of the family, Charlie. We actually adopted him several months ago and he has made himself right at home.

Until next time, keep praying for this nation ... and VOTE!

Figure 3 - Ain't I cute?

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

Wheatnet Conversion/Studio Rebuild

We just finished the last studio rebuild and conversion of the studios to a total Wheatnet infrastructure. The last studio was the WPWX Control Room which, like the others, an LXE Control Surface was installed into custom built studio cabinetry. In addition, this room was expanded in order to fit the new setup.

The new LXE had only been in operation for less than a day when we began to get reports that the operators couldn't voice track into the NexGen automation system using beds without the beds overwhelming the voice part of the voice track. This seemed really weird to me.

When I had a chance to look at the problem firsthand, I found that the problem affected all the buses, including the program bus. Even when the fader was placed all the way down, the levels from the bad faders would be beyond full tilt. It only affected four faders.

Of course I tried a reboot of the surface and the mix engine first, with no change. I then set about looking at all of the settings for the surface. I really didn't find anything that might cause the issue on those four faders.

The next step was to call Wheatstone support to see what they thought might be causing the issue. At first, they sent me down the same rabbit trail of looking at settings. Again, this led nowhere.

When they logged into our system and saw that there were no settings causing the issue, they decided to try downloading the remote software. Apparently, if your surface doesn't have motorized faders and you adjust the level of the fader channels with the virtual faders, it creates a null that the actual physical fader has to overcome by being placed at a higher level before it will have actual control of the channel level.

When he told me that, it made sense; but what did not make sense was that we never paid for or installed the remote software, so it wouldn't have been because we used it on the surface.

Screen shot of the LXE remote app looking at one of our surfaces.

After downloading and installing the remote software, they logged it into the suspect surface and sure enough, the four problem faders in virtual world were all the way up. The only way we would have gotten control of the problem faders was turn them up full tilt and then back down again. Who knew?

We still haven't figured out why these faders ended up like this in the first place since we didn't have the software before the problem and I was told that it was unlikely they used the remote software at the factory. Still, the one good thing that did come out was that I now have access to the remote software, which is very handy in diagnosing issues, including the ones that are often created by the humans using the control surface.

Cambium Radios

A while back, we had a tower crew take out our Trango Apex Ethernet link between our Hammond studios and the Lansing transmitter site. This happened while they were replacing a transmission line on the Lansing tower. They had accidentally yanked out the Ethernet cable when pulling down the old transmission line. What probably really took the radio down was when they tried to reinsert the cable without allowing us to power down the POE first. The radio part still worked but the physical Ethernet port stopped working.

Since there's no longer service available for the older Trango radios, we had already been planning on switching to Cambium radios for both of our 18 GHz links. The radios had actually already been purchased but they had not been installed because the adapter plates to make them fit to our current antennas did not work. So they were sitting on the shelf waiting for us to purchase new antennas and install them.

Since the Trango radios were still working, we were in no real hurry to move on the installation, especially with all the other projects we had going on at the time. However, once the Trango radio was damaged and we couldn't repair it, our hand was forced and we had to move on the purchase of the new antennas.

So, very recently we had a tower crew switch out both the radios and the antennas at the Lansing and Hammond towers. This went very smoothly and the radios were up and working by the end of the day.

Before we put them in service, I put my laptop on the radio at the Lansing site and ran an online speed test back to the Internet service in Hammond. When the test showed that I was getting the speeds expected from the actual ISP, I was glad to see that the 18 GHz link was no longer a limiting factor in the equation.

The other thing I did before putting the network back on the new link was to take one of our spare Wheatnet blades and see if I could send a couple of streams through the link. I had tried this with other setups before and it was bad. This time, however, the audio was solid and the blade acted as if it was sitting on the network in Hammond.

It has given me hope that we might be able to actually separate the link into virtual LANs and then have our signal delivered to the site in uncompressed AES stereo audio. We'll have to see where this leads. For now, we once again have two Ethernet links between the site with the 18 GHz and the 5.8 GHz radios, which provides us great redundancy using the Surestream feature in our Worldcast Horizon codecs.

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

October has marked my 30th year at KCBC. To put that in perspective, I was 33 years old when I started at the station, and now I am 63 years old. It sure has been an interesting 30 years. So much has changed in broadcasting, and in the world for that matter.

The COVID crisis continues and it continues to be annoying. I sure will be glad when we get past this. I have noted one positive aspect, however. I recently had a discussion with my granddaughter's schoolteacher. She said that she normally gets sick quite often, but since March, she has not been sick even one time. Thinking back, I am in the same situation. I normally can't go to long before picking up a cold virus, but I have been without even the slightest hint of a cold for the last nine months. It seems the mitigation measures do reduce the transmission of viruses. I always thought hand shaking was a really bad thing to do.

During the month of September, we replaced the skylights in the transmitter room. The station is housed in a metal building and has four skylights in the transmitter room. The building dates to 1987, and the fiberglass panels that were installed as skylights were deteriorating to the point where they were starting to leak rain water. We had new Lexan panels installed to replace the aging fiberglass ones.

The difference is huge. The amount of light in the room is almost overwhelming. The air is pretty dirty in the summer months, so the amount of light was quickly attenuated by the dirt to an acceptable level. When the winter rains come, the light will probably increase again, but that will be good to compliment the darker winter days.

Also during the month of September, we had a film crew on site to shoot some movie scenes for a Hallmark style film. It was going to be ten people for about a day and a half, but that turned into more like 25 people over 4 days or so. It was indeed a fun time watching how they did things (including strict COVID rules), and they all seemed to enjoy their time around the station.

We are in the process of replacing several aging computers. This month I am replacing the streaming computer. That is going much smoother than last month's replacement of the NexGen server. This time, the Wheatnet WNIP audio driver worked right out of the box (with a little help from Wheatstone). It is interesting to note that the WNIP driver works just fine with the Windows 2004 patch that caused so much grief with last month's installation.

New skylights in the transmitter room really brightened things up.

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

It's nearly a new month, the local fires have abated, and it's time for a critique of our stations, the local broadcast industry, and general responders' performance during the upheaval. Although that's a broad swath to review, it's been said that those who refuse to learn from the past are doomed to repeat it again. Hmmm… what's my favorite for repletion? Second verse same as the first!

It all began with a high-wind event that took out power over a wide area of metro Portland. At one point there were nearly 400,000 without power and multiple faults took out power to Mt. Scott. At the end of the line, it would take time to restore power.

We ought to consider our generator high on the list for evaluation. For the last few years, we have had problems with the generator shutting down with over-temp alarms. A year or so back, we went through an extensive evaluation of the shutdowns. At some point, someone had added a low-water alarm to the generator, a typical field mod which was paralleled with the high-temp alarm. This mod was done years ago and, we thought, had worked ok.

After extensive testing and multiple shutdowns with no overheating, we removed the makeshift low-water alarm. The generator performed flawlessly for the nearly four-day power outage with good, solid performance. Also, in previous years we rerouted the exhaust to help direct it away from the building. This was quite effective and a big plus with studios also in the building.

In the past, I have talked about the other installations near on Mt. Scott where KKPZ is located. Many of these sites are public safety and land installations. One supports a wide area wireless internet service. Another provides dispatch for the local ambulance service. Both of those were up and down during the power outage.

So, on the power score, KKPZ performed flawlessly and much better than some of our immediate neighbors. Ongoing generator maintenance is the secret ingredient here. Our station continued to provide service to our community during the emergency.

Generator fuel consumption is an item on my watch list. We can scale consumption based on typical ratings, but that is a generalization at best. I had been watching for an opportunity to get a real-world measurement of consumption. Consumption was skewed to the good side, as our tenant station was not on the air. Our tenant's transmitter is a Nautel XL12 (at 10 kW). That transmitter has one quirk when a power phase failure is detected: the transmitter remains locked out until ac power is cycled.

Our generator detects the loss of any phase and starts the generator (approximately 30 seconds). Even if the other commercial power phases have not failed, the generator will kick in and pick up the load. So, the XL12 will not see a power drop and will remain in safety shutdown. That transmitter was off for three days.

Internet service is worth mentioning. Two of the three of the internet services were down during the storm. DSL connections are operative with inherent slow speed. At KKPZ, we were able to work around the lost internet connection.

Throughout the valley, many users that relied on internet connections to receive fire evacuation warnings were simply out of luck.

Although the EAS system wasn't activated, broadcasters did provide coverage and information to the public. The EAS system should probably have been used for several of the immediate evacuations. I have that on my list for future discussion with the emergency management community.

The smoke associated with the fires was a major problem in the metro area. Fortunately, there was not much impact on the physical facilities at Mt. Scott. The smoke did have one virtue, as the nightly riots did subside somewhat for a time.

Unfortunately, the riots returned in full force when the air cleared. Most recently. in opposition to racial inequality, the rioters tore down the statue of Abraham Lincoln and attacked the Oregon Historical Society building. Seems reasonable to me that time spent inside the Historical Society building learning

about the history of Abraham Lincoln might have been time well spent.

At the deadline for this report, we learned that the Portland metro religious community has stepped up to address the current Portland riots. A consortium of Catholic, Protestant, and Jewish religious leaders has formed a group to attempt a resolution to the ongoing riots. From this quarter we wish them our best and prayers in this endeavor.

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

Microwave City

To say it has been a busy October is an understatement. Truth is that the month started off very slow. Then it quickly ramped up.

We were able to get the final microwave link replaced at KLVZ. That day was a bit crazy. The weekend of the 9th, we had some crazy winds come through. The new microwave antennas didn't come with stiff-arms, so none were installed. We were told they'd be fine, despite telling the tower crew we would need them.

That Monday morning, we noticed a couple of the stations sounded bad. We found the RSL was way off. I quickly put two of the stations on Barix (internet) backups just so we could be on air with good sound. We called the tower crew and began working a plan.

We had a few things to do. Re-aim two of the microwave antennas – it was the transmitter site end of each that had moved in the wind – and then install the new ones which were already on the schedule for that day.

To address the shifted antennas, we called Derek Jackson, our good friend and broadcast engineer/climber. We didn't want to delay the KLVZ install any more than it had already been. We were able to work it out so the tower crew met us at the KLZ transmitter site. They gave Derek two stiff-arms for the two sites and then proceeded out to KLVZ to replace that dish. Derek climbed both towers that day and got the work done. Without him, we would have been delayed several more days. We have not had any issues with the alignment of the antennas since then, but we also have not had the extreme winds in town. Hopefully the anti-rotation arms will hold them in place.

We have had some other microwave link issues here and there, most recently a low-voltage alarm on the KLTT Cambium transmitter site radio. It doesn't seem to be causing any issues, thankfully. We are going to replace the power supply in hopes that is the issue. Stay tuned.

Another issue with that same link was packet loss and a carrier-loss alarm on the ethernet port on the transmitter site Cambium radio in cold temperatures. Once it warmed up a bit, the problem disappeared. We sent Derek up one cold morning and had him check/try different things. Finally, we concluded that the Cambium ethernet surge suppressor was the source of the problem. We removed it (for the time being) and the problem disappeared.

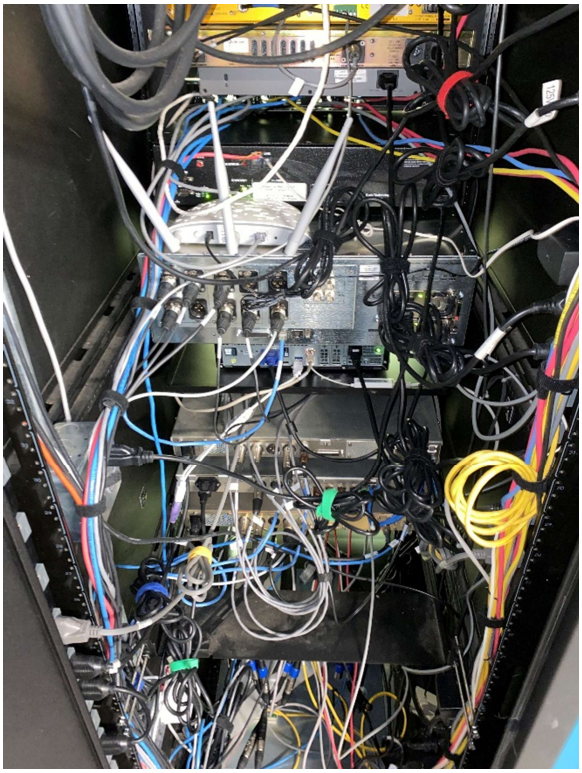
We have had some other random issues here and there that make no sense. I won't even try to explain them. A simple reboot of the affected unit seems to fix the problem. We aren't sure if this will become something we will have to learn to live with or if there have been some issues and we just aren't seeing what the actual cause is. Only time will tell.

KLTT Rack Work

One big project that we wanted to do was redo the equipment rack at the KLTT transmitter site. 25+ years of layered wiring and equipment moves and replacement tends to get things a bit tangled… okay, a LOT tangled. It was a bird's next. It wasn't for lack of trying, but keeping things cleaned up was impossible.

We took the station off one Saturday night and moved the equipment around in the rack, getting it to make sense. For instance, the Burk ARCPlus was at the bottom of the rack. You had to get on

your hands and knees to see the screen and do anything on it. Not ideal. We were given a two-hour window to take the station completely off air to do the work and we needed nearly every second of it.



The rack at the KLTT site was a bird's nest before we completely redid the rack.

We were able to get the station back on air in that time window, but still had work to do.

After spending about an hour longer than we wanted at the site, we called it a night and went back the next morning and did some more work. While still not great, it is in much better shape than it was, and I even went through and labeled every cable. I most likely missed some but, for the most part, every cable should have a label to help us know what it goes to.

Security Lights

After arriving at the KLZ transmitter site early one morning, I noticed the barn lights were not working and the light on the back door of the transmitter building wasn't working. It was dark out there. I began inspecting and found the light at the building appeared to have a bad photocell. We replaced it and it immediately blew. The connection was really loose, and I decided I wanted to replace the light.

The 175-watt sodium bulbs we have to use are very expensive and hard to find, so why not move to LED like we did at the KLTT transmitter site? We went to the barn to try to get those lights to work and had no luck either.

I ordered four LED wall-pack lights from Home Depot. My dad and I installed the ones on the barn. It took some work, but we were able to get it done, and now the front and back of the building are back to being lit up.

Lights are always a great deterrent for people up to no good. They don't want to be seen, and our lights are very bright.

We had Derek do the transmitter building lights. They are up much higher and require the extension ladder. I hate ladders, especially a wobbly extension ladder, and I knew doing that work would be very difficult by myself and Dad is banned from most ladder work. Derek was able to get out one morning and get them done. These are very nice lights with bright LEDs to get things lit up when we are out there in the dark, which happens more often than I'd like.

My next light project, and who knows when that will happen, will be to add LED lights to the back room at KLTT. We have two 8-foot fluorescent lights back there, and they take a bit to get bright, and even when they do, it isn't very bright and it's difficult to see when we are working in the rack. My husband and I did some nice LED lights in our basement a couple years ago. They are nice because they link together so you don't have to wire each one in separately. I need to find a way of doing this as we have a high ceiling and the other lights we have hang down with a chain. I might try to install some lights in the rack as well to really light the area up. There is no rush on this project, and it may wait until 2022 sometime.

Wheatstone

We are gearing up for a major studio infrastructure upgrade in Denver. We are replacing our Wheatstone G6 consoles, which were installed in 2005, with new LXE surfaces.

I am looking forward to getting away from the TDM system and moving to AoIP. We will finally have everything in one system, accessed with one program and no more trying to figure out how to get items from our TDM system onto our Wheatnet system – that always made things more complicated.

It is my hope, and the plan, to have the equipment here and maybe even a room or two finished up before the December issue. We have worked tirelessly going through our systems,

mapping everything out, in hopes of not forgetting anything. We won't know until we get things installed, and that's okay. If we have all eight signals on the air, I'll be happy.

We are expecting this to take us through the end of the year. I will do my best to take some before and after pictures of the studios as we get this done. I am most looking forward to having the wiring cleaned up because there won't be any! Okay, there will be some, but it will be minimal.

Roof Work

Ten years ago, we installed the microwave links on the roof at the studio. This building is a high-rise, and from that roof we have a line of sight to all our transmitter sites.

Back then, I don't think we knew what UV-rated CAT5 was. We used regular plenum CAT5e and didn't think much of it. Somehow it survived those ten years, but the jackets were cracked and brittle, and in some areas, the copper of the pairs was exposed.

Thankfully, where our cables come out of the conduit is on the west side the building and has some shelter from the sun. If the cables were anywhere else, they would've given out years ago.

We bought a PVC NEMA box to install as well as several RJ48 couplers. We didn't want to run new cable up to the roof as building maintenance filled the end of the conduit coming up from our 12th-floor suite with expanding foam. We cut the cables, put them in the box with the couplers and then ran the new UV-rated cable from the box to the equipment.

The weatherproof box we used to splice the CAT5e cables to the rooftop microwave radios as well as cables for satellite antenna and broadcast receive antenna.

We were a couple of happy engineers when that project was done!

It took us the better part of the day to get this done as we ran into some issues here and there. Now we have good UV-rated CAT5e that should last for a good long while.

Fires

It seems much of the western US is on fire. It has been for some time, but other than dealing with smoke for the past few months, for me personally, it hasn't really been close to home.

I hate the fires; I hate the fact that people are losing their homes and some even their lives. The smoke, at times, has been horrible in the Denver metro area.

I remember hearing about the East Troublesome Fire in Grand County on October 14. Grand County is where my parents, my husband and I have a couple of cabins. We already had the Williams Fork Fire, which started while we were on vacation in August, and that was in Grand County as well. The Williams Fork Fire wasn't all that close, and the firefighters on scene did a great job at keeping it away from the local town.

The East Troublesome Fire started in an area that was rural. Basically, a bunch of trees and sagebrush. Nothing was around it. They brought in fire crews to begin with, and it remained in good condition, mostly under control for right at a week. It was northwest of our cabins and it had to cross a lot of ground, a river and large two-lane highway before it got to us.

All the reports each day from the incident commander were upbeat. They had a plan. That highway was going to be almost a last stand for them. I remember watching the 5:30 PM live report on October 21st. Once again, upbeat. Things were

going as planned. But about an hour later, all hell broke loose.

The winds picked up. Reports describe them as hurricane-force, 70 mph+. My dad called me at 6:45 or so and told me we were on pre-evacuation notice and that we would go up to the property the next day to get our ATVs out of there along with anything else of value we might be able to grab.

Thankfully, my husband and I had winterized our cabin the week before, as it's not well insulated and we cannot keep it open for winter. For some reason, I had made the decision to bring nearly everything home when we did that. All our fishing stuff, bedding, towels, even my extra clothes I keep up there just in case I fall in the lake or something. We left our ATV and the trailer that goes with it in the garage as we do every year, but we did bring our boat home. I even brought home things I would normally store at my parents' cabin for the winter.

My parents, on the other hand, had everything up there, as their place is a year-round residence. They had just moved to an every-other weekend winter schedule and had plans to go up the weekend of the 23rd.

Back to the phone call… my dad told me we would caravan up there the next morning to get our stuff just in case this turned into something. Then, about ten minutes later, he called me again to let me know we weren't going up. We were just given the evacuation notice – get out NOW!

The fire was moving fast. It had jumped the highway and was making a beeline for our property and the town beyond. I brought up our cameras and was looking west at our cabin and could see an orange glow. My heart sank.

While I know those cabins are just things – they are not our primary residences, just a refuges from the hectic pace of the city and for us a place to get away from the chaos of life several weekends a year. I watched the cameras nearly nonstop until at 9 PM, when we lost the feed. The power company shut the power off to the entire area. All I could do was wait and pray and that is what I did.

I thought for sure when I woke up the next morning that I would hear reports about the small mountain town of Grand Lake being nonexistent. I brought up the local news channel on my computer at work and just listened. Initial reports said that the town was gone. I hate how news stations recklessly report before fact-checking. Thankfully, those reports were false.

They had a map of the fire, and we found out the Lord answered our prayers. The fire made a turn to the north about a mile or so from our property. We still weren't sure if they were standing, but based on the map info and NASA FIRMS infrared maps showing heat signatures over the past 24 hours, it appeared we were okay.

Many others, friends included, were not so lucky. We had one friend barely make it out alive. The fire hit areas fast and hard with little warning. Our friend got the evacuation call, got in his car, and caravanned out with neighbors with the fire licking at their heels and glowing embers from the fire blowing ahead in the hurricane-force winds and starting spot fires. They had to stop numerous times as the wind was bringing trees down across the road. Thankfully, one of them brought a chain saw so they could cut the trees and get them out of the way so they could continue.

The red glow of the fire was visible as the East Troublesome Fire approached.

One elderly couple decided to shelter in their basement. That was their home and they wanted to try and make it through. Unfortunately, it was confirmed two days later that they did in fact, pass away.

We did finally get word, after a good friend who works in law enforcement in the area was able to get in there and confirm that our property was safe and unharmed. In fact, a herd of elk was hanging out on our property, probably one of the few safe places they had there on that unburned island.

If our cabin had burned to the ground we would have survived, and we wouldn't have to start over as that was/is a second home. But for so many others, they live there year-round. My heart breaks for all those people. We know too many who lost their primary/secondary homes, including long-time KLZ host John Rush who had just purchased his cabin in the area in September. We are learning more as each day passes.

We had a nice snowstorm drop a foot or more of snow on the fire a few days later. It didn't put it out in the heavy timber, but it calmed it down. With that, fire crews have been able to make a ton of progress on containment lines. Their main goal is to protect the south and east sides of the fire from Grand Lake down to Granby as those are the two towns in the path if the fire flares back up again. They have allowed people back into Grand Lake who were on the east side of the highway that runs through the area. We just got the word at press time that we are being allowed back in as well and we plan to head up there over the coming weekend.

My dad has some winter prep to do, and we need to check things out to make sure that while the power was out, nothing froze. At some point, the area will reopen and the healing will begin. But that may not be for a while. This fire came late in the season. Once the snow starts, a lot of work will have to wait until the snow melts. Our playground where we ATV and fish was decimated in the fire and it's unlikely any of that will be opened for years to come.

If anyone wants to help Grand County with rebuilding, the Grand Foundation is the place to do it. Any donations given will go right back into Grand County. Go to www.grandfoundation.com and on the front page there is a link to donate to the wildfire emergency fund.

Coming Up

As I mentioned earlier, my November will be filled with the Wheatstone project. I look forward to it and being able to have our equipment up to date. Other than that, I may do some maintenance at the transmitter sites. We will see what pops up.

That about covers it for this edition. I pray you all stay safe and well.

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/100.7 MHz, 5 kW-U, DA-1
KLDC • Brighton - Denver, CO
1220 kHz, 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/95.3 MHz, 2.2 kW-D/430 W-N, DA-2
WDCX • Rochester, NY
990 kHz/107.1 MHz, 5 kW-D/2.5 kW-N, DA-2
WDCX-FM • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDCZ • Buffalo, NY
950 kHz/94.1 MHz, 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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