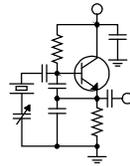


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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Site Security

Transmitter sites have long been problematic when it comes to security. Typically, sites are remotely located, with transmitter buildings well set back from roads and away from homes and businesses – and for good reason. But that makes them ripe for trespassing, burglary, theft and criminal mischief.

Because there are high-tech equipment and salvageable metals located inside and out, such sites are attractive to thieves. The isolation makes them doubly attractive to copper thieves and plain old burglars.

There is also an “attractive nuisance” element to tower sites. Over the years, I have dealt with a number of incidents of trespassers – on the tower. When I was in Texas back in the early 1980s, chief engineer of a Dallas FM station and responsible for a 1,549-foot candelabra tower, I dealt with BASE jumpers that just couldn’t stay away, despite the razor wire topped fence around the tower. One evening I was watching “PM Magazine” on a local TV station and a feature on BASE jumping caught my eye – because it was my tower the jumpers were launching from! The problem was evidently worse than I thought if a national TV crew knew about it and themselves trespassed on the site to document what was happening.

While we’ve had a few trespassing climbers over the years at Crawford sites and a couple of incidents of cut guy wires, most of our issues have

been of the more pedestrian variety – copper theft and building break-ins. Earlier this year, we caught a guy on camera as he pried his way through the back door at one of our Birmingham sites, entered the building and grabbed a telescope before he fled while the alarm siren wailed. If it had not been for the damage done to the door and building, it would have been comical – he dropped the telescope in the antenna field not far from the building, so he got away with nothing.

Another issue we have dealt with here and there is illegal dumping. Some people will commit a crime to avoid paying a \$40 dump fee, and we’ve had people leave all kinds of stuff on transmitter site properties. I would probably have fronted them the \$40

dump fee to keep from paying someone several hundred dollars to clean up the mess.

Thankfully, we’ve not had a site cleaned out by burglars or thieves. I can’t recall an incident where we lost any equipment in a break-in. We’ve lost some tools here and there, maybe some generator fuel, but nothing of great value. Still, the potential is there. And that’s why we have alarm systems at all our sites, to serve as a deterrent and also to apply time pressure to any thieves that do get in.

In recent years, we have added another element to our security systems: video. Our early systems included analog camera arrays with fixed views of towers, transmitter building, entry gate and other locations of interest. Later, we added steerable



This 1080 PTZ camera gives a complete view of the KLTT antenna field, providing close-ups of all the tower base areas. Amanda can even use it to observe the tower lights operating.

pan-tilt-zoom (PTZ) cameras to allow us to take a closer look at virtually anything at the site. The system at the KBRT transmitter site at Oak Flat (Southern California) was on the bleeding edge of the state of the art when we installed it in 2012.



This bullet camera is remotely zoomable so the field of view can be easily changed. It has 1080 resolution, operates in dual visible/IR modes for day/night and contains an integral IR spotlight.

Lately, however, such systems have been supplanted by truly high-resolution hardware with 1080 and even 4k cameras, and rather than analog signals connecting over 75-ohm coaxial cables, this new hardware connects over IP using Ethernet cables. Rather than sending 12-vold DC power to the cameras via separate conductors, the current generation of hardware is powered via power over Ethernet (PoE). Rather than using a security DVR to record and manage the camera feeds, such systems now use network video recorders (NVRs) that have a built-in Ethernet switch and PoE injector.

We have never had video surveillance at the KLZ or KLTT transmitter sites in Denver. Both have alarm systems that extend even to outbuilding and tower base fences, and those systems have been adequate. Of late, however, we have begun to see changes that give us concern. At KLTT, someone destroyed the lockset on the back door in a burglary attempt, and at KLZ, someone cut the lock off the gate. Clearly, we need to step up our security at those two sites.

And so it was that Amanda, Keith and I launched out on a great experiment. Could we, mere radio engineers, install and configure a video surveillance system at these two sites ourselves, without the assistance of professional security system installers?

I consulted with the sales rep at a vendor that Rick Sewell recommended, and he was very helpful, ascertaining the site particulars and mission objectives and making recommendations on equipment. This included an eight-channel NVR, a 1080 PTZ camera and a 1080 bullet camera to start. I placed the order, and in a few days the equipment arrived.

Amanda and I connected everything up in the engineering shop and largely through trial and error, got it configured with IP addresses, site/camera names, etc.

A couple of weeks later, when we got some good weather, Keith, Amanda and I took the equipment to the KLTT site and got started on the installation, which involved use of a hammer drill, masonry anchors and ladders.

That first installation took most of a day, mostly because it was learn-as-you-go. We had to make a couple of trips to Lowe's to get additional hardware, but by the end of the day, we had a working system.

A few days later, we did the same thing at the KLZ transmitter site. In some ways, that site was more challenging because of the height of that building and the way the Ethernet cables had to be routed, but we (mostly Keith) got that done and it wasn't long before we had a working system at that site as well.



This KLTT tower is over 1,000 feet from the PTZ camera.

At this point, we're not experts by any means, but we are comfortable working with this equipment. As such, I had no issue recommending a similar system from the same vendor to Brian Kerkan in Detroit, where we have had a longstanding issue with ATVers on the WRDT transmitter site property – and (presumably) those ATVers recently crashed into one of the tower base fences at the site, doing over \$1,000 in damage. It's just a matter of time

before one of these trespassers gets his head taken off by a guy wire, and there are plenty of those low to the ground for the four towers on the site.

That 2012 state-of-the-art system at the KBRT Oak Flat site is also slated for an upgrade to an IP-based high-resolution system. We have had amazingly little trouble at the site since going on the air in early 2013, but once in a while, a miscreant does make an appearance.

Thanksgiving week, a young man and woman walking on Black Star Canyon Road came over the gate and were walking into our site toward the transmitter building when the Doppler system picked them up and triggered the alarm. That pair turned around and ran back out, which meant the overall system worked as it should, but the image resolution was not sufficient to identify either of them. With a new system, we'll be able to tell if a trespasser's dandruff shampoo is actually working.

It is disheartening that we have to expend time, effort and resources in elaborate site security measures, but such is the world in which we live. I'm just glad to have options that we can implement ourselves, without involving outside contractors that have no understanding about radio and RF.

Jumping Through Hoops

At the end of October, the FCC granted the application for our new Rochester, New York translator and we now have the CP in hand. Since that grant, I have been working with the tower site landlord, a site we have occupied since 1996, to get a lease drafted and executed. Agreeing on the lease terms was the easy part. It's jumping through all the hoops required by the landlord that has kept me spinning my wheels for over a month now.

I get it, at least to a degree. A structural analysis is a must-do on any such project. Even this little one-bay antenna that weight 41 pounds soaking

wet and its ½-inch foam-dielectric transmission line add to a tower's weight and wind loading and must be considered.

A lot of the rest, however, is check-the-box stuff that's easy for the landlord but a genuine PITA for the prospective tenant. For example, we have to either get a building permit from the city for the installation of the antenna or provide proof that no permit is required. We called the city twice and were initially told that no permit would be required if there were no changes to the tower structure or to structures on the ground. In the next call we were told that we would have to provide the results of the structural analysis (sealed by a NY-licensed engineer) and an installation drawing (also prepared and sealed by a NY-licensed engineer) to pull the permit. I wonder, is some building inspector from the city going to shimmy up the tower and inspect the installation?

We're still working our way through all this stuff, and we hope to at least get through the structural analysis by the middle of this month. I won't hire an engineer to do the installation drawing until we're certain that the addition of the antenna and line pass the structural. Hopefully, plan check at the city won't be another "permanent spin cycle" as we experienced in Southern California a few years ago.

This translator has great potential for our Rochester operation. It should provide a listenable signal over most of the market, depending on interference coming across the lake from Ontario. The directional pattern has a 6 dB null to the north (toward the lake and Canada), with filled envelope in all other directions from east around to west. The transmitter will be a BW Broadcast TX300V3. We plan to house our equipment in a wall-mount rack in the WLGZ transmitter building.

The New York Minutes

By

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

Hello to all from Western New York! It is hard to believe that this will be the last column for 2018. It doesn't seem that long ago that we were planning out our spring/summer projects and activities, and now here we are on the doorstep of ushering in a new year.

2018, for the most part, was a good year for our Buffalo and Rochester stations. We did not have a lot of equipment problems as compared to previous years, so keeping up with regular maintenance items was easier as there were very few distractions by way of emergencies. We did not have any big projects to complete this year, but we were blessed with the addition of an FM translator and Omnia.9 processor for WDCZ, a new Burk ARC Plus Touch remote control and Omnia.9 for WDCX(AM), a remodeled air studio for WLJZ, and the addition of a new riding mower for the transmitter site at WDCZ.

We did lose a couple of NexGen audio servers, but these were old machines and in all probability were way past their life expectancies, anyway. We also had our streaming encoder computer fail in Buffalo due to a bad power supply. It was unfortunate that we had to replace this computer instead of repairing it, but the power supply was no longer manufactured and no stock was available from Dell.

Looking back, 2018 was a good year, but it is time to set our sights forward to the New Year and to whatever it brings.

On the personal side, I had numerous health issues to deal with this year, but by the grace of God, those issues are for the most part under control

through medication and diet. The absolute highlight of my year occurred on November 7th, when my first great-grandchild was born! Mia Kimberly came in at a little under 8 pounds and 19 ½ inches long, but her birth was not without complications. She had a really bad infection which has kept her in the hospital since birth but is scheduled to be released shortly. We are so looking forward to

having this new addition to our family home and in good health.

Aside from some minor equipment failures, there is not much else to report on from the CBC New York stations. Cris has been diligently working with the landlord in Rochester to secure a lease so we can install an FM translator there for WDCX(AM). I understand there have been numerous hurdles to overcome and details to work out to make this translator a reality. It would be a blessing to have our Rochester AM broadcasting on an FM channel also, especially for those listeners who do not regularly listen to the AM band. Stay tuned... hopefully we will have good news to report on next month about this translator.

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 very merry Christmas, and happy engineering!



The Motown Update

by

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

Greetings from Crawford Detroit! Much has been going on around our properties over the past month.

We had someone crash into our tower fence at the WRDT Monroe transmitter site, causing damage to the post and fence. It is a good time to add some cameras and put in remote monitoring.

We have been working on the new WRDT translator signal, which will be co-located at the WCHB site. The antennas have been installed and the equipment is ready, but we had an issue when the installer over-tightened the N-connector on the isocoupler, causing one of the loops to move. It is in the process of being readjusted at the factory and we should be on the air soon.

Some of the fluorescent light fixtures in our offices have had ballast issues. I came across a product from a company called Toggled, which is located right here in Troy, Michigan. Their web address is <https://www.toggled.com/e-series-led-tubes.aspx>

Toggled makes a direct-fit led bulb that is the same form factor as a standard fluorescent tube. What's even better is you can completely eliminate the ballast. Less noise, power savings, and higher reliability. We have used them throughout the office in fixtures that had a bad or failing ballast. The replacement cost is reasonable, and they are available through Home Depot.

Last month we had the ATU roofs repaired at the WRDT tower site near Monroe, Michigan. All the work was completed before the snow started flying, so we were glad to check that off our list.

We have started using Skype for some interviews on the Bob Dutko show. When the guest has a good microphone, it works out quite well. We loaded it on our VOXPro machine so we can take advantage of the existing mix-minus that is already wired to that machine. The delay is minimal, and it

sounds good when taking callers.

We have been getting a lot of great comments on the new Nautel J-1000 transmitter and

our new Omnia.9 processors. WCHB is nice and loud, and very clean. We have our backup audio set up into the processor for failover. This will be helpful if we lose the primary link. At WCHB, we have two network providers, and this has worked out well for failover. If one link drops, the audio switches right over. Not only do we have the primary and backup STL in place, we now also have audio stored on the processor itself for

file playback.

We have been upgrading our remote control monitor displays around the studio. In the WMUZ-FM control room we replaced a larger computer with an Intel Compute Stick. The Intel Compute Stick plugs directly into the monitor and only requires a keyboard and mouse.

I have been working on my project Lesharo (motor home) as I have time. I hope to try and take it to Hamcation in Florida next year. I was able to get all the gas appliances tested, and it was the first time I ever worked on an LP gas refrigerator. Chances are, this frig had not worked for over a decade. I pulled it apart and cleaned the jet and burner assembly. After re-assembling it and installing it back into the motor home, it lit up right away and works flawlessly.

I will provide picture of my ham radio setup in an upcoming column. I plan on putting in four solar panels for 1,200 watts into a battery bank. I have been reluctant to add a bunch of stuff to it until I take a few trips, as the Lesharo has a reputation of being unreliable. It's my hope that all the maintenance will pay off. It has a 4-cylinder Renault engine. I have been becoming more and more familiar with its shortcomings. I figure life is an adventure, hopefully everything will work out well.

Until next month, 73 from Brian, W8FP.



News from the South

by

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

Ah, memory lane. We've just finished Thanksgiving and we're headed into Christmas, and I'm grateful for too many things to name. God's love is at the top of the list, of course, but somewhere in there is the fact that all of our main transmitters here are now solid-state Nautels.

In the past, we were as likely as not to have a bad tube around the holidays. The tubes were expensive enough to start with, but the shipping was the killer. We'd find someone who had a tube in stock, order the replacement, and then deal with FedEx and UPS aggravation. They (especially FedEx) are notorious here for declaring something "undeliverable" just because they're running behind schedule. The beautiful thing when that happens is, you have to wait at least another full day for the truck to return the tube to the shipping depot, and then run to said depot to pick it up yourself. In the meantime, you're hoping that your even older aux transmitter will stay on the air.

As long as I'm sharing memories, here's an unpleasant one... Not long after we moved here, Sandy woke up blind one morning. Long story short, she ended up in intensive care with a rare condition called Pseudotumor Cerebri (also called Idiopathic Intracranial Hypertension, for those of you who like jaw-cracking names). At the time, WDJC-FM had the main transmitter (a Continental 816R-4) driving the main antenna at the top of the tower. The aux (an older-if-equivalent Collins) fed the aux antenna, just below the main. The main antenna line suffered a burnout and the Collins wouldn't come up. Talk about being stressed: wife in intensive care and 93.7 was off air! You never know when God will use you. In my case, we had a wonderful, devoutly-Christian receptionist named Trish Rogers. I'll never forget, and will never be able to thank her enough, for staying with Sandy in the hospital while I wrestled alligators at the WDJC site on Red Mountain.

Big Changes!

WYDE-FM is no more. Well, rather, it has changed places and formats. I should say that Superstation 101 is no more. All of us had mixed

emotions about that one, but we never could make that station profitable. We had plenty of listeners (believe me, the complaints that we received and that appeared in social media after the change proved that!), but that never translated into sales success.



101.1 FM is now WXJC-FM, paired with 850 AM WXJC. WYDE-FM's call has moved to 92.5 FM, paired with WYDE 1260 AM. The actual mechanics of the process, from an engineering perspective, weren't that bad. After all, we use Wheatstone AoIP system and it's a simple matter to change the cross points. Right?

Heh. We have been set up for years and years to think of "101.1" and "WYDE-FM" as synonyms. My ancient, tired brain had a time early on the morning of "changeover day," Monday the 5th of November, when it was time for the switch. It's always something, and it's usually the little things: we hadn't thought to change the labels in the cross point. Also, the station names in NexGen hadn't changed. Todd and Jack, being both geniuses and steely-eyed missile men, helped develop a plan that would reuse the existing assignments as much as possible, but I still checked everything three times during the switchover. I have a radio in my office at home and was bopping around between stations to make sure that the proper format was on each one.

The next joy, however, was the fact that the "new" WYDE-FM/AM (92.5 and 1260) plays Gospel music at night – similar to the "new" WXJC-FM/AM (101.1 and 850). Heh. Listening to the radio, it was hard to make sure that each station was playing the correct Gospel music. I actually had two VNC windows open, one watching the NexGen control screen, and another on the Wheatstone XPoints. We had a few glitches, but thank the Lord, they were quickly resolved.

We continue to have the occasional glitch. That's only to be expected, given that for years and years, 101.1 has been set up for a talk format. Everything about it was talk. Most of the day, we had live and local programming, and NexGen was running in "live assist" mode. Now, of course, we're

mostly in “auto” mode. All the liners had to be changed, all of the legal IDs had to be redone, and all of the macros had to be carefully checked and altered.

But here’s to a good 2019. Brett Larson and Frank Franciosi are overseeing everything, and we’re finally starting to settle down.

Geeks!

Ah, I do love me some geeks. Todd, Jack and I all love open source software, which is produced by the aforementioned geeks. But it does have its aggravations, especially if said geeks are Free Software Nazis™.

These folks are dead serious about free and open-source software in their operating systems, and they don’t want to hear about anything that isn’t free and open-source (FOSS). This is why some Linux distributions have struggled with audio and video formats: if it’s a proprietary “closed-source” codec, the FOSS Nazis won’t include support for it. This is manifestly silly, because you can almost always find information online to add that support yourself, but at least the FOSS Nazis can boast that their distribution is as pure as a white-bearded priest.

The most recent example occurred this morning as I was writing this. One of our CentOS machines out in Denver needed to copy some files from an external hard drive. We couldn’t get the drive to “mount” (i.e., to appear, ready for use) no matter what. Some Googling finally showed that CentOS 7, for whatever reason, doesn’t include support for Microsoft-style disk formats. I had to add a repository in Romania (and ask me how I feel about that!), then install the support manually. Once I had done that, everything worked fine.

Ah, geeks. You have to love them. NOT!

A Shorting Stub

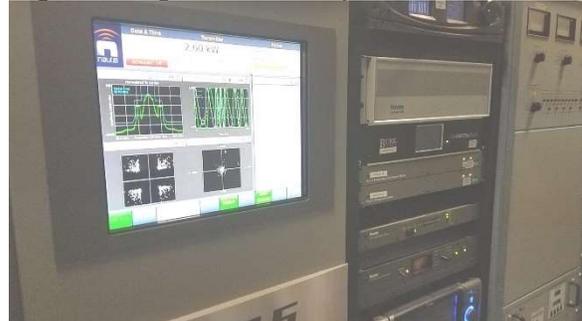
I mentioned last month that we had built and had installed a shorting T-section on 92.5’s transmitter output to help protect the transmitter and upstream equipment from lightning. I forgot to include some pictures, though, so they’re included for this month’s issue.

Cris is much better with data printouts than I am. He can scan a spreadsheet or a long list of data points (from an AM MoM model, for example) and mentally visualize what’s happening. I’m more of a graphical-type guy. To each his own. But several months ago, long before doing 92.5’s shorting stub, we had to build one out of RG58 for 850’s 96.9 FM translator at the 1260 transmitter site. (Say that a few times, really fast, to win a free slice of pie.)



Hard to take a good picture in that small building. The stub is mounted horizontally.

At that time, I found a nice web page that would graphically illustrate the bandwidth of a shorting stub. It was fun playing around with the numbers and seeing, visually with Mark One Eyeballs, what happens to the bandwidth with changes in characteristic impedance. Not surprisingly (and as the formulas will tell you), the lower the characteristic Z of the line, the sharper the bandwidth. For pure kicks and giggles, I ran it down as low as 1 ohm (ridiculously impractical in real life) to get an outright nail in the response.



All Nautel, all the time! (Also, all Omnia!)

As is, at the standard 50 ohms impedance, the bandwidth is pretty broad. In real life, this is a good thing. Really, we’re just trying to keep lightning out of the finals in the transmitter, and believe me, once you get below the FM band, it approaches a dead short. But that broad bandwidth also meant that it was pretty easy to adjust for lowest VSWR. It’s almost unmeasurable. The Nautel transmitter AUI shows zero watts reflected on the front panel. I have to go to the “meters” display to see anything and it’s very, very low.

I hope everyone has a blessed and wonderful Christmas, celebrating the birth of our Savior. Thanks for continued prayers for my wife Sandy, and until next time, keep praying for this nation!

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

A few months ago, we finished installing the final two Telos Hx6 phone systems in the WYRB and WYCA control rooms. Installation in the other two control rooms, WPWX and WSRB, had occurred the year before. We wanted the rooms to be consistent with the way the equipment was structured.

When I first arrived here, we were not taking advantage of the mix-minus features that the Wheatstone TDM bridge router system afforded us. In fact, each control room had two external 8-channel Shure mic mixers; one fed the caller input to the phone hybrid and the other fed the VoxPro recorder.

Most of these mic mixers were well over ten years old and were getting noisy. Rather than replace them, I opted for just getting rid of them altogether. They were not necessary. So, the installation of the new phone system provided the perfect opportunity to make this move.

Since most of the stations don't take live callers and primarily used the phone systems and VoxPro recorders to record callers for playback on air, we decided to build the new infrastructure around these needs.

It has almost become a standard in radio to use the VoxPro recorder in a split mode, with the host mic on one channel and the caller audio on the other. This makes it easier to edit and process the caller audio without affecting the host audio.

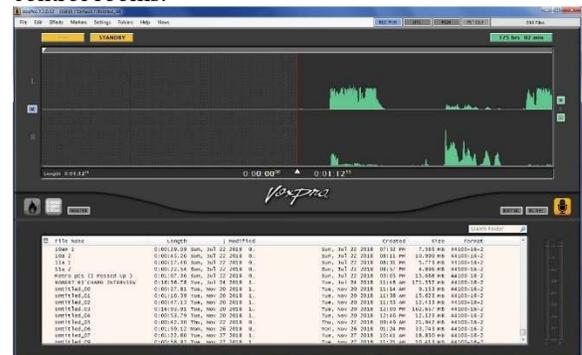
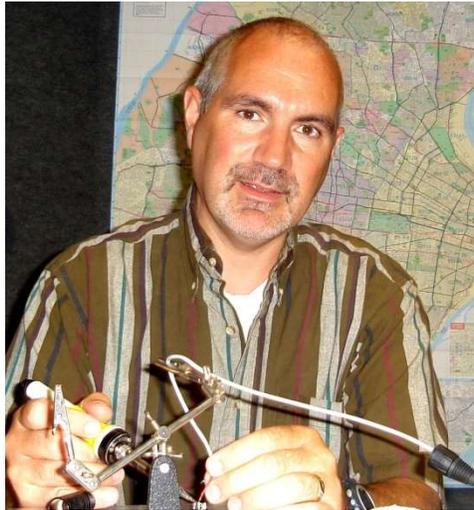
Since the VoxPro recorder computer is using a Wheatnet PC (WNIP) driver, the best way to do this is to first send the mic and caller audio to a Wheatnet blade built-in utility mixer (UMX), panning the mic to the left and the caller audio to the right. From there, we used the Wheatnet Navigator software to connect the UMX to the VoxPro input.

This also meant that we were building the new infrastructure mostly around the Wheatnet system and not the older Wheatstone TDM system. That was purposeful as we will eventually be an all Wheatnet operation in the not-too-distant future.

After finishing this work, we forced all four of our stations to function with this configuration. This was fine for two of our stations, since they hardly ever have a reason to use it any differently than in the split mode, with the mic and caller audio split between the two channels.

However, two of the other stations do use their VoxPro Recorders to just record long form programs on a regular basis. They were used to using the X-Y controllers built into their G6 control surface to switch the VoxPro recorder from the external mic mixer to other busses on their surface. We had some complaints, but since we had CD recorders and a NexGen DRR machine, I felt that was enough to satisfy those needs. Still if we were all Wheatnet, I would have given them that kind of control.

A month or so later, I found out that the VoxPro software actually had that kind of control built into the VoxPro 6 and 7 versions. We were already sitting on that function without knowing it. Once I knew this, I determined that we could still satisfy those users who wanted to record on VoxPro with other sources than just the split mode we had now as the default for all four control rooms.



VoxPro hot buttons.

The feature allows for making changes in crosspoints in Wheatnet just like you would with the

Navigator software. But instead of using a crosspoint map, something that would be beyond the capabilities of the average operator, it uses “hot buttons” to give the users control over an input or destination by selecting the source for the destination. In this instance, we are selecting the source for the VoxPro Wheatnet PC driver and thus the input of the VoxPro recorder.

To get to the Wheatnet settings in the VoxPro software, you have to be logged in as an administrator. From there, it’s fairly simple to create a hot button, name it, and then select the source and destination that the hot button will join together.

The first thing I created was what we called

our default record mode with the split mic and phone caller, I called this REC PHN. Then, since we already have their control surface Program and Utility buses already connected into the Wheatnet system, I created hot buttons for these two configurations. Finally, we already tapped a post-delay point in our audio chains for the online streaming and DRR recording. I wasn’t sure if this would get used much on the VoxPro, but gave them the option anyway.

Even though the hot buttons are hosted in the VoxPro computer, it can control any crosspoint connection, so it could be used for functions beyond just the VoxPro recorder.

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

The transmitter facility at Mt. Scott has changed over the years, with many milestones along the way. One of the milestones was a major fire at the facility in 1985. After the fire, the building was reconstructed, creating somewhat of a dichotomy: it was 1948 in some areas and 1986 in others.

Recently, Thor Waage, an engineer at an FM station that had formally been located at Mt Scott, found a 25-year-old facility report which gave a great deal of insight into the radio history at the site. That report shows many of the facts that

were only oral history until Thor found the report. Interestingly, the report was not able to document the early KALE and KPOJ years of the station. Michael Everhart, another Portland area engineer, has found a pre-fire photo of the building, shown below.

At the time of the fire, some Portland-area historic items were stored in the basement of the facility. Notably, the original transmitter for KGPP – the voice of the Portland Police – was a great historic loss. KGPP transmitted on 2.442 mc (AM) and was heard widely in the area. Note the old-style designation for frequency (megacycles).

After the fire, the upper story of the building was rebuilt and a new roof installed. The communications tower, eight feet to the south of the building, has a great deal of impact on the building roof, impact being the operative word, as in ice

impact. Ice that forms on the 170-foot tower tends to have a very firm understanding with gravity when it falls. By the way, rain gutters don’t do well with ice fall either. Watching for ice fall events and making required repairs has yielded a 30-plus-year service life. Not a bad record.

In Oregon, the EAS system is being readied for refurbishment. Over the years since the new EAS system went on line, some counties and cities budgeted for EAS equipment. The original idea was that local warning points would originate alerts using an EAS ENDEC



The pre-fire KPOJ transmitter facility at Mt. Scott.

without requiring local broadcast stations to intervene. The challenge is that many local areas, particularly rural counties, have limited budgets. The new EAS hardware, which costs several thousand dollars, is low on the list when the sheriff's payroll is being cut. Even in populous counties, the original ENDEC is the old gray box that is out of style with minimal support these days.

This year, the local broadcast community, the Oregon Association of Broadcasters and local engineers are leading a project to reinvigorate the

EAS system in Oregon. The project will provide funding for all Oregon counties along with a VHF / UHF link to local broadcast stations as an outlet to provide reliable emergency information to the public.

Stay tuned as we work out the kinks relating to the collision on the VHF / UHF local relay network (LRN). The collision during the NPT a year ago was a major embarrassment. This year we disabled the network during the NPT test.

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

Security!

We recently decided we wanted to finally get KLZ and KLTT set up with some security cameras. We had the lock cut at KLZ by someone, so rather than wait for something worse to happen, why not invest in a system? Rick Sewell had found a good company, Security Camera King, that he used to purchase video surveillance equipment for the Chicago market. He put us in touch with the vendor, we found what we needed and purchased it. They were quick to ship, and the quality of the equipment seems to be pretty good. We weren't looking to put a camera on every tower but instead wanted one looking up at the road/gate to the site and a PTZ that we can use to tour the site continuously.

We got things set up at the studios and proceeded to plan the installation for each site. We started at KLTT, and ran into some hiccups, but after a day's work, we were able to get it installed and working. It is HD quality, has a smartphone app, and is easy to use. I have found that at night, it is harder for it to focus as there are so many bugs flying around that the cameras try to focus on them instead of the more distant tower base areas.

The KLTT installation taught us what we did wrong, so installing the other equipment at KLZ was a breeze. It didn't take us nearly as long as we (Keith, Cris and I) each knew what our part was and

got to it. We have found out here that even the other buildings nearby cause the cameras to not focus as well at night, but all in all, a good system that will come in handy for us.



Coming Up

There really isn't much going on by way of projects right now. November and December tend to be slower months. With the holidays and vacation days, people just aren't around as much. Even so, an engineer always has something to do, right?

We are working on setting up a mechanism that will allow us to essentially cycle the power to the tower with the microwave link on it at the KLVZ and KLZ transmitter sites. We have had this set up at the KLTT transmitter site for some time now. Out there, when there is too much static in the air, it glitches the microwave radio on top of tower #4 for some reason. This power reset mechanism allows us to call the Burk remote control and issue the command to reset AC power to the tower. It powers the circuit off for several seconds before turning it back on.

We have had several instances this past year at KLZ when the generator runs and power is then restored, it scrambles things and we lose the microwave link. We aren't entirely sure why, but we know that this will provide the fix. We also have the link at KLVZ go weird sometimes, so this will give us the option to reset things if we need it. It saves me a trip to the site and more importantly, it saves on

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down time. Time is money after all. Lord willing, by the time you are reading this, we will have gotten this installed at the KLVZ and KLZ transmitter sites.

We don't have any projects planned for December. It will be a short month as Christmas will be here soon, and since I have vacation days I need to

burn before I lose them, I plan on taking the week of Christmas off. It'll be nice to recharge my batteries for the New Year and come back ready to get things done.

I pray you all have a very blessed Christmas. Until next time... that's all folks!!!

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KBRT • Costa Mesa - Los Angeles, CA
740 kHz/100.7 MHz, 50 kW-D/0.2 kW-N, DA-1

KNSN • San Diego, CA
1240 kHz/103.3 MHz, 550W-U

KCBC • Manteca - San Francisco, CA
770 kHz/94.7 MHz, 50 kW-D/4.3 kW-N, DA-2

KKPZ • Portland, OR
1330 kHz/97.5 MHz, 5 kW-U, DA-1

KLZ • Denver, CO
560 kHz/100.3 MHz, 5 kW-U, DA-1

KLDC • Brighton - Denver, CO
1220 kHz/95.3 MHz, 660 W-D/11 W-N, ND

KLTT • Commerce City - Denver, CO
670 kHz/95.1 MHz, 50 kW-D/1.4 kW-N, DA-2

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

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

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

WDCZ • Buffalo, NY
950 kHz, 5 kW-U, DA-1

WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT

WCHB • Royal Oak - Detroit, MI
1340 kHz/96.7 MHz, 1 kW-U, DA-D

WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D

WMUZ-FM • Detroit, MI
103.5 MHz, 50 kW/150m AAT

WMUZ • Taylor - Detroit, MI
1200 kHz, 50 kW-D/15 kW-N, DA-2

WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT

WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT

WYRB • Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT

WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT

WYDE • Birmingham, AL
1260 kHz/95.3 MHz, 5 kW-D/41W-N, ND

WXJC-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT

WXJC • Birmingham, AL
850 kHz/96.9 MHz, 50 kW-D/1 kW-N, DA-2

WYDE-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT



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