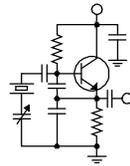


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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The Local Oscillator

The sharp-eyed reader will note that yes, this issue begins the 27th year of publication of *The Local Oscillator*. Back in the day, 1990 to be specific, the L.O. began as an internal newsletter that I wrote entirely myself and distributed to the engineers in our six (!) markets for the purpose of disseminating technical information that might be of interest. It was all done by paper and U.S. Mail in those days.

Mr. Crawford saw one of the early issues and instructed me to also send copies to station managers, writers, producers and anyone else within our company who might have an interest. So just like that, circulation went from half a dozen to close to 30.

Somehow, word continued to get out about the *Oscillator*, and I began getting subscription requests from interested people outside our company mostly equipment manufacturers and dealers but also other engineers here and there. Pretty soon we were up to a readership of 50+.

About that time, it occurred to me that readers would find it more interesting if voices other than my own were heard in these pages, so I began asking our engineers and others to contribute. That turned out to be a big hit. Content became much more diverse and interesting.

It was somewhere in there that I began publishing online. At first, we simply emailed out the newsletter in PDF format, but later, when Crawford established a web presence, I began posting it online and simply emailing out a link. Those links got shared and shared again.

In 2003 or thereabouts, Paul McLane published a commentary in *Radio World* titled, "Cris and The Local Oscillator." It was a very flattering piece, praising our little newsletter and pointing out the niche that it served. That commentary produced a lot of additional interest, and at present, I have no

idea what our readership is. I get responses from all over, and I mean *all over!* People read these pages in New Zealand and other exotic places, for crying out loud!

I take seriously my role as editor and publisher of *The Local Oscillator*, and I know our writers also take their parts seriously. We have to be careful in our writing, providing details that might be helpful to others without giving away any company secrets. Don't look for audio processor settings in this newsletter!

At this point, I have no intention of slowing down or stopping the publication of the *Oscillator*. It's a labor of love for sure, and I know our writers also view it that way.

It is my hope that we can continue to serve a niche readership with occasionally deeply technical, unashamedly conservative and Christian, and often lighthearted and entertaining content that people can't wait to open up every month.

What's New for 2017?

In this company at least, we plan to begin converting a couple more markets to AOIP: Buffalo and KCBC (Northern California). Both those markets were scheduled for control room board replacements this year, and it just doesn't make sense to put in another analog or even digital mixer that doesn't have AOIP capability.

We plan to start experimenting with automated HD Radio time alignment and have budgeted for the necessary equipment for one of our FMs. Assuming this works out okay, we would plan to move into this kind of arrangement in all our FM markets in 2018.

We also plan to continue moving into the VOIP arena with our stations, starting with Buffalo early this year. We're sticking with the Avaya IP Office system. At some point down the road we

would integrate some or all of these systems, making it easy to do four-digit dialing between Crawford facilities. This system also makes it easy to put an extension off the system at any IP-linked transmitter site, which allows our engineers to make long-distance calls from the transmitter site without incurring LD charges.

And along those same lines, we may begin experimenting with VOIP studio (on-air) phone systems in some markets this year.

Finally, in the "I wouldn't rule it out" category, we might end up with a couple more

translators by the end of the year. There could be a translator auction window in 2017, so there is that possibility for a couple of our AM stations, and we might also find in-market translators that would work for us.

Some folks have been saying, "Goodbye, 2016 - nobody liked you anyway." I'm not one of those folks. 2016 was a good year for our company and our industry as a whole. With Trump in the White House and his picks on the FCC and in the judicial, I think 2017 will be another good year.

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

Hello to all from Western New York! As 2016 officially comes to an end, I can't help but wonder what 2017 has in store for us. All in all, last year was a very good year for the CBC Western New York stations. We did not have any down-time due to equipment failures, and what few equipment problems we did have were rectified quickly and with minimal expense.

We are fortunate indeed that we have the luxury of having redundant equipment in place in the event of equipment failure that would take us off the air. There are still many stations in the Buffalo area that are lacking this luxury, and when a failure occurs, the engineer is literally "under the gun" to get the stations operations back up and running, and in most cases, with little in the way of spare parts to fix the problem.

Recently, one of the local stations had such a situation arise, when the transmitter went down with no back-up in place to continue broadcasting. The engineer on call was dispatched to the transmitter site, and after several hours of troubleshooting, found that the tube had shorted, taking out several of the doorknob capacitors in the tube socket along with it.

Knowing the station had no spares, he began calling around to see if any of the other local

engineers had any spare parts he could borrow until he could get the needed parts. When I received the phone call, I knew that I had everything he would

need to get the rig back up and running, and having been in the same situation myself years ago, was glad to lend a hand. I had a tube that had been replaced some time ago, but I knew that it would make minimum power, enough to keep the station on the air long enough to order and receive a new rebuild.

We installed the used tube, replaced the cracked capacitors on the grid ring and set about re-tuning the transmitter. It had been about eight hours since the initial failure occurred, which to us would seem like an eternity, but he was thankful that someone was able to help out in his time of crisis and get them back on the air at least a day ahead of time. I was happy to help out, and did not look upon this as "helping the competition" but rather lending a helping hand to someone in their time of need. I believe in karma, and I surely would be appreciative if I were in that situation and needed help, whether parts, a helping hand or even advice.

While on the subject of equipment failures, the morning of December 16th I received an early morning phone call from the WDCX board operator that NexGen had frozen up and the audio



The Local Oscillator
January 2017

had stopped playing. After asking a few questions, I had him reboot the local machine and call me back when the computer had rebooted. The return phone call resulted in a sickening realization, the file server had died!

I got dressed and headed down to the station to try and get the server back up. In the meantime, he was airing programs downloaded from the FTP servers of our programmers.

After a half hour or so, I determined that the file server was fried and not coming back up! As luck would have it, we had two brand-new servers in house, slated to be installed right after Christmas, so I removed the bad server and installed the new one in its place. After configuring the network addresses and connecting it to the NexGen network, I phoned RCS tech support to get the new server started with uploading the inventory from our backup drive. I have never been so thankful that we had a complete, up-to-date backup!

I installed Team Viewer on the new server to allow RCS a direct connection into the server, and they began the tedious task of re-loading everything from the back-up drive on to the new file server. Meanwhile, we were having to scramble to get our spot inventory that was scheduled to play, on the air. Luckily, we back up our production workstations on local external drives, so we were able to extract those spots scheduled to air from those local drives.

In all, from start to finish, it took almost 18 hours to get the server installed, inventory loaded onto it and all of the workstations re-mapped to the new server! I cannot begin to think how we would have recreated all of our songs/spots without having an up-to-date backup. If you do not currently back up

your file server on a daily basis, this should serve as a reminder of the importance of having a good backup in case of a major failure!

The second file server has already been installed in the Rochester cluster with the backup there installed onto the new server. After the new year, I will be completing that installation, therefore we will have new file servers in both of our Western New York markets.

Last year, we had planned to perform some remodeling in our Buffalo studio facilities. The plan was to swap the current control room with the talk studio. The reasoning behind this was to enlarge our talk studio, as we have numerous groups of people who appear as guests on our local three-hour talk show each afternoon, and our current talk studio is very small in size, as compared to the air studio. The suite that we are located in has no available expandable space, so any changes in studio size must be made within.

I have been contacting contractors to obtain bids on this project, and most are simply not interested, or will make an appointment to see the project, but never show up. So far, I have been able to obtain only two bids, and both are way too expensive!

We are going to step back and take a closer look at what *really* needs to be done, and eliminate any extra frills in the project, therefore cutting the costs down to a more reasonable amount. Hopefully, by mid-January, we will have nailed down a reputable contractor at a reasonable price so we can finally start this much-needed studio project. More on this project next month.

The Motown Update

by

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

Greetings from Motown. I hope you, and your families had a wonderful Christmas and a Happy New Year.

December was a busy month, with an opportunity to upgrade several of our automation systems. WEXL and WRDT were both upgraded to new hardware, and we have been replacing old network cable with CAT6 for all of our systems.



I installed some new Cisco managed switches, and took the opportunity to upgrade the firmware and drivers over the holiday at times that the studios were lightly used. The new switches are managed allow network traffic to be controlled and optimized.

We had an opportunity to broadcast live for the Glory of Christmas show at Northridge Church during the Sunday worship program with Chris Stevenson. It

was great live and local radio. It was a good opportunity to meet some of our listeners, and talk to the performers of the show.



Figure 1 - The WMUZ antenna switch was full of water.

We had some really cold temperatures, and had a pipe burst in the transmitter room. The break was located directly below the antenna switch, of course. I had my family with me, and we had just finished viewing a Christmas light display when I received a call from the station.

It's the call you don't want to get. There is water in the transmitter room, and it's spraying all over the place. The main transmitter faulted with high VSWR. I switched to the backup transmitter and had the same issue. We reduced power on the backup to the point that it would stay on the air, allowing me time to get to the station.

When I arrived, the water was contained, but it had sprayed up and on the antenna switch and hardline connections. Of course, this affected both the main and backup transmitters since both were connected through the switch.

I decided to configure our backup HD transmitter that was located outside the transmitter room to analog mode. I was able to direct patch it into the backup antenna. This allowed me time to clean up the water and transmitter room. I was able to re-plumb the main transmitter into the main antenna, bypassing the switch with existing hardline sections within an hour. I restored the main transmitter to full power operation.

With the switch now taken out of service, I was able to dismantle and uninstall it.

Well, it was full of water. I drained the switch and took it apart, and fortunately there was no arcing. The fingerstock looked good, so I was able to clean and dry everything and returned it to service.

The plumbing will be modified to prevent an issue like this in the future. This is an example of why layout of a transmitter room is so important. In this case the pipe ran directly underneath the RF switch with no protection.



Figure 2 - The ARCPlus Autopilot screen. Green good, red bad.

I was able to finish up the ARCPlus remote control installations at all the transmitter sites. Once all of the remote units were installed and networked, I was able to concentrate of developing some Autopilot screens to make it easier for the operators to take readings, and have all the controls and information available on one screen. In the case of WRDT, we have two transmitter sites. In the past, it was necessary to log in to each system individually.

At night, WRDT switches from the main site downriver over to the Motower night site that is located closer to Detroit. I liked having the ability to see the tower lights at our day site, along with the readings from both locations. If something does not switch correctly, the operator can clearly see what the issues are. If a parameter is not correct, the meter or status turns red.

Until next time, I hope you have a wonderful 2017.

News from the South

by

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

The happiest and most blessed of the new year to all of you!

In my work, 2016 was a good year. We managed to put two translators on air, fix a number of long-standing issues and keep everything on the air. I love my job, I love this company and I'm having a blast.

At the personal level, though, 2016 wasn't so good for my wife, Sandy. She has been dealing with severe muscle spasms for over a year now, and the doctors are at a loss. She's had so many MRIs and X-rays that she glows in the dark and they still don't know. She's tried all of the usual drugs, including Neurontin, Lyrica, baclofen, you name it; still the spasms occur. They move around, too, which is part of what baffles the doctors. One day the buttocks might be painfully tight; the next day, it moves into the lower leg. She's missed so much time at work she's in advanced leave now (simply put, she's borrowing from future medical leave).

I've learned more than I ever wanted to know about neuromuscular disorders and it goes without saying that we've seen several different doctors. In December, we went to see a neurological specialist, one of those guys who gets all of the hard cases when no one else can fix the problem. Given her past history with epilepsy (among other things), he ordered another MRI, this time of the brain area. We're hoping to get some kind of resolution this month, Lord willing. I appreciate the prayers.

But back to work. For 2017, we don't have any major projects on the schedule, which is fine with me. We have a lot of cleanup and catch up to do. We also have more training on tap for the staff, especially our production folks. We're going to take advantage of the 2017 "breather" to be even busier than before!

Web Server

The new web server in Denver has been built and is currently online through the old server,

which is forwarding all requests to the new machine. Cris Alexander and Amanda Hopp have done the heavy lifting as far as mounting and configuring the servers; Keith Peterson has done his usual excellent job with fixing the inevitable glitches that crop up anytime you move a WordPress site.

The old machine has been using virtual servers for over a year now. These won't work with very old browsers; if you happen to have a really old machine with Windows 95 on it, try it. If you browse to one of our station-specific sites -- for example, kkpz.com -- you'll instead land on the main page at

crawfordbroadcasting.com. Older browsers didn't know how to specify the site in the header.

All browsers nowadays send the desired site name in the request header. Given that, an Apache web server can look at the header and say, "OK, he/she wants kkpz.com," and will then forward the request to the correct subdirectory on the machine. This allows you to have many different sites on a single server, all sharing the same IP address. There are some quirks to doing it properly, though, especially with SEO -- Search Engine Optimization. We want Google and the user's browser to show, "kkpz.com" and not, "crawfordbroadcasting.com/~kkpz" (or whatever).

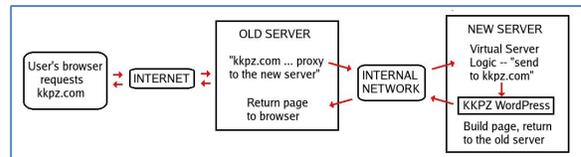


Figure 3 - Using a reverse proxy with virtual servers on a second machine. Your mileage may vary.

Keith has done a lot of work to ensure that our URLs are "pretty," so I was very pleased to see that the proxy/forwarding that I'm using (which, ironically, is actually called a reverse proxy go figure) keeps the headers intact and allows the SEO

stuff to work transparently. Not being a Web Warrior, I had to dig through the confusing and often-contradictory Apache documentation to figure out how to do this. A dozen Google searches took me to pages that said, "It's easy! All you have to do is ...ö ... but it wouldn't work, or the URLs would be ugly, or at times, we'd be ping-ponging between the old server and the new. Not good.

At length, though, I managed to get everything figured out. For those who care, a simple diagram of the current setup is shown in Figure 1. We used this to transition each site from the old server to the new. As Keith would finish a site, I'd go in and set up the proxy, bringing the site "live" on the new server machine. The final step, of course, will be to eliminate the old machine and to allow the new server to directly face the Internet, handling the requests directly. The way we've set this up, that should be a simple matter of changing some connections and the network settings.

But Keith may still have some additional cleanup, so he has to be on standby for the move. I've mentioned this before: WordPress actually builds each page on the fly. It pulls templates, then reads a database that contains the actual content, constructs the HTML page and then sends that to your browser. This not only has a small performance penalty, it means that if anything is changed, you're going to get an ugly page. Keith has done a heroic job cleaning up these glitches.

As I write this, we're getting ready to put the new Web server machine directly on the internet. We'll then semi-retire the old one (it can serve as a backup). No doubt Keith will have to do a little cleanup, but hopefully, we've managed to keep things transparent enough that it won't be a big problem.

And now, we turn things over to our resident bulldog, Todd Dixon, who refuses to be defeated by anything digital. Until next time, keep praying for this nation!

Life in The Digital Cage Todd Dixon, CBRE

There are three things that we came up against this month that were probably worthy of passing on to colleagues. Our jobs are so cross-disciplinary that there are many times that experience doesn't come around often enough for us to do something completely by muscle memory alone. Such was the case with one of the problems that occurred this past month.

I tip my hat to Cris for detailing the issue that they had with a pair of Dragonwave radios in California. Firmware is an important aspect to

communication with any computing platform. California had mismatched firmware in their radios after an odd power outage problem. Our Buffalo market had a firmware compatibility issue a couple of years ago with a Telos Z/IP they were trying to get to talk between Rochester and their studio; I helped them with that one.

Last month, we had our own problem with a pair of APT codecs. The newly installed WXJC translator at our 1260 tower site was dropping packets. The codec at the tower site was new and the one at the studios was an older unit. It finally dawned on me that it might be a firmware issue. Getting the same firmware in both units fixed the issue. Reliability is a wonderful thing, but also works to our detriment in situations like this.

We try to do everything we can to make remotes happen. Our Bridge-IT makes them simple with even basic internet service at the client's location, but there are always exceptions. We met up with one of them last month. Jack went to check connectivity and the customer was using a Verizon "Jet-Pack" for their phones and internet at their store.

A couple of years ago, I purchased a wireless-to-Ethernet converter from TigerDirect with the idea that someday, we'd run into a client that had wireless and no Ethernet source. Jack and I dug in and got that thing talking on our network and we went back out to try our luck with their Jet-Pack. Not all things end up perfect, and this one certainly didn't. We had to tell our sales people that their "Internet" wasn't able to handle the remote. We are confident, though, that we understand the setup for the wireless-to-Ethernet device and that will pay off in the near future.



Figure 4 - Todd made this codec pair happy, so I'm happy.

Finally, no update would be complete without a "that's how Microsoft gets you" story. In early November, WDJC-FM's audio server started

doing what it had done for the majority of 2015. That is, becoming disconnected from the database server and blanking the control room screen. You might recall, it is a simple fix, you restart Nexgen and everybody is happy until the next time it happens then you start getting mad.

This was happening about once a week on Tuesday or Wednesday, early in the morning. This was a regular interval that was longer than the problem we had previously, and we hadn't had it since before we had installed our Wheatstone blades. I combed through the machine and called RCS to

simply document it and begin a trouble ticket. Their tech was looking through the settings as well and noticed that internet time check was on. We don't have any Nexgen machines connected to the internet, save one for remote access.

You have probably surmised the issue: without a connection to the internet, the time check cannot be done. Windows prioritized the time check above connecting to our database. Fixing that setting has resulted in a happy WDJC audio server again. That's how Microsoft gets you.

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

Exciters

Last month, I discussed the challenges we had recently with the aging Broadcast Electronics FXi60 exciters. I stated that I had one repair pending. In this instance, we had an exciter with a low forward power alarm. Not only was it showing an alarm, but it was not making the 20 watts output per the setting we were using when we connected it to the backup analog transmitter at WYRB. After consulting the manufacturer, we ordered a replacement final PA for the unit as that was the likely suspect.

When we got the replacement, we swapped it out and I connected it to the transmitter again. Once again, I got the alarm and this time the output power was even lower than before. We again consulted with the manufacturer and it was decided that we should pack up everything and send it to them for analysis.

After they got it on their bench, they called us asking what the primary purpose for the exciter was. We told them it was part of a backup HD-only transmitter but we also sometimes would use it as a replacement should we have problems with another exciter in a different transmitter. It was our go-to replacement since it was in an HD-only transmitter and a backup at that. Indeed, it had been used as a temporary exciter in two different transmitters recently.

At this point, we found that there are several attenuators installed in the exciter since it was being

used in an HD-only transmitter. So in reality, there was nothing wrong with the exciter just the engineer setting it up! My guess is that most of you that have used this model for a while now probably

already knew this. If not, this will be useful information. If you are taking it from an HD transmitter to run in an analog situation, you will need to bypass those attenuators. So if you're making the switch like that, you not only have menu setups to worry about but these attenuators as well.

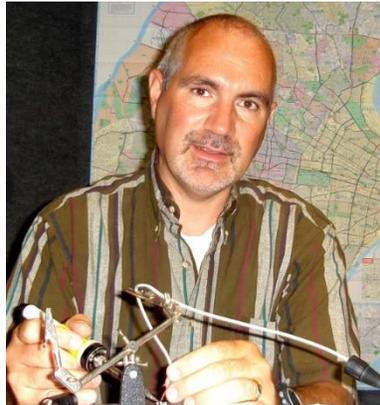
Tower Light Alarms

During the last month, we had been getting alarms on the WSRB remote control that our mid-tower beacon light was not working.

This would primarily happen just after dusk when the tower lights would transition from the daytime (strobe) to nighttime (red) setting. The alarms would come on for a few minutes and then turn off. We would typically get two or three of the alarms during the first half hour-after dusk, and then they would stop the rest of the evening and overnight, only to occur the next night.

I had a good idea it wasn't an actual tower light problem because anytime I had driven by the tower all the lights were on. However, I couldn't rule out a light problem since the alarm was never on when I drove by. This meant I needed to sit in my car near the tower and physically watch the lights while logged into the remote control on my phone.

A good half hour was all I needed to



determine that alarms were false. I never saw any variance in the lights, even when the remote control was showing them in alarm condition. That was when I set about looking for what was causing the false alarms.

It didn't require much of a hunt. One of our engineers, James Kelly, was making his weekly visit to the site and looked through the lighting control system. He found two of the alarm modules were quite swollen (see the photo below) and had obviously been very warm in the recent past. We ordered new modules and replaced them and now don't have the nightly ritual of deleting emails with false alarms.

Streaming Data Alarms

Another incident last month was a problem with our stream encoder computer. This is a stand-alone rack-mount PowerEdge PC used for all four streams. We had received alarms from the streaming service provider that it wasn't getting song data from the encoding computer for long periods of time.

The streams were working and sounding good, but the metadata wasn't getting there. A reboot of the system only provided temporary relief. This wasn't just a convenience service to the listeners of our streams, but it also affected getting proper data to Sound Exchange for music royalties and just as important, we have ad replacement taking place on three of our four streams, so that wasn't functioning correctly either.

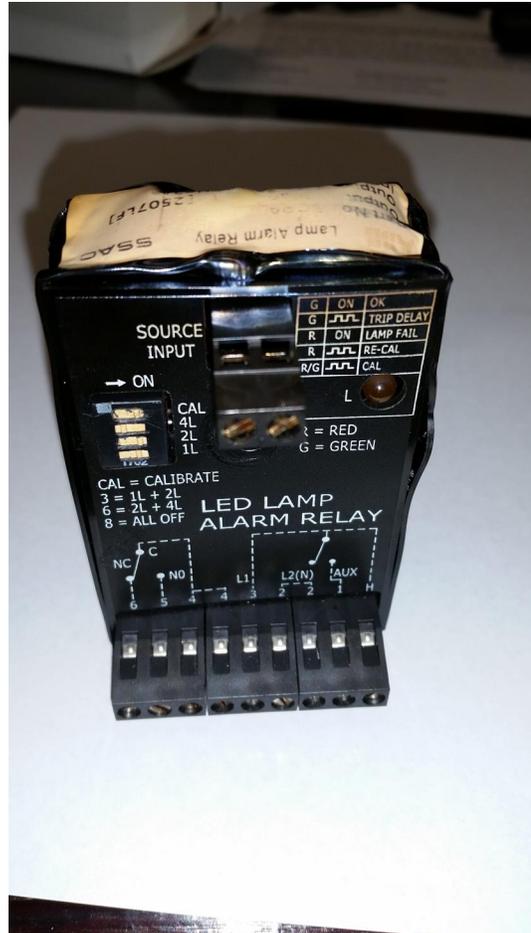
My guess is that it was an issue with the computer. I started looking at the computer for anything obvious. It didn't take too long to see that the hard drive was completely full. This was most likely the root of the problem and causing the computer to not run at its maximum performance.

It did take a bit for me to track down what was taking up all the space. I found storage in the Windows folder was taking up almost all of the 500 gig drive. I actually had to go into the folder properties and select "show hidden folders." When I did this, I found a folder named, "Temp" was the culprit.

This is not the same Temp folder where you find all your temporary Internet files. That is usually sitting on the root of your "C" Drive. The one in question is hidden inside of the Windows folder. When I explored the folder, I found it was making "CAB" (archive) files both small, as in zero kilobytes, to large, as in 1.3 gigabytes. It was making

almost 20 to 30 of these large files each day, dating back to when the machine was set up.

Research on the Internet showed these files were usually the result of failed updates. Most likely Windows updates. This didn't make sense because



Failed WSRB tower light monitor module -- note the swelling at the top.

we had Windows updates turned off. What I did notice when on the machine was that I had a Dell update notice create a new backup disc that wouldn't go away. I would hit the cancel, even selecting the "don't show me this notice again" button. However, it would show again in less than five seconds. I finally got this to go away by selecting "Cancel" and rebooting the machine. I then noticed the CAB files were not being created any longer after this.

We then actually set about deleting them and the problem with the data not getting to our stream provider went away as well.

Valley Notes
By
Steve Minshall
Chief Engineer, KCBC

The new KCBC translator is on the air! The construction was mostly uneventful. There were few challenges along the way, like learning how all the equipment interfaces with the network.

The distance from the transmitter building is about 600 feet from the tower, about twice as far as a twisted pair Ethernet cable run is supposed to operate. Not only is it a long way for the data to travel, but past experience indicates that RF could be a serious problem with 600 feet of wire at a 50 kW AM station. Visions of smoking RJ45 jacks come to mind.

The solution to our audio and data communications was solved by the implementation of a 5.8 GHz link. The Ubiquiti NanoBridge M5 units that we used for this purpose presented a learning curve, but with some study and advice they came on line and talked to each other just fine.



One end of the 5.8 GHz Ubiquiti NanoBridge M5 link to the tower.

I am amazed at how robust the link is. I had one unit mounted on the metal roof of the transmitter building and one running inside the building, and the link was not only solid, it was un-interruptible no matter where the inside antenna was pointed.

After the tower end of the circuit was installed, the ends of the link were carefully aligned by sight and then turned on. They immediately

started talking to each other. A final adjustment of the antennas resulted in only a 1db improvement, so the eyeball alignment was nearly spot on. The one-foot diameter dishes do not have a super-tight beamwidth in fact they tend to feel more like a 950

MHz beamwidth, which makes sense because the frequency-to-antenna-size ratio is about the same.

We were contemplating mounting the FM isocoupler on the tower with unitstrut and insulators as Cris did in other markets, and while not a bad way to go, it dawned upon me that we could mount the isocoupler in the antenna

tuning unit building (aka ödoghouseö). This made for a much simpler installation and one that I could do myself and save a lot of tower climber time. This also allowed me to test the system through the



The tower crew mounts the ERI antenna bays on a mast that was later bracketed to the tower.

isocoupler into a dummy load. I also verified that isocouplers do radiate to some degree. With 60 watts through the isocoupler to the dummy load, the signal could be heard for about a quarter mile. It's not a big deal, but it is interesting.

One of our difficulties that resulted in a delay was a defective power divider for the 2-bay ERI antenna. When I tilted the power divider each way, the guts inside shifted. The movement was also visible by the center pins of the DIN connectors moving off center.



The isocoupler was mounted inside the tuning house, which saved a lot of time, trouble and hardware.

Once we had the replacement power divider and everything else ready to go, we ran into another challenge: the weather. We wanted to do the installation on a Saturday so that we could shut down the station for tower work without causing significant revenue loss. The weather forecasts kept coming up with stormy Saturdays, one after another.

We finally had a good Saturday scheduled, and all was well until I double-checked the antenna dimensions. Cris had advised that there was a large discrepancy in the dimensions to adjust the antenna elements based on either the prints or handwritten notes supplied with his Denver translator antenna. Fortunately, I read through all the emails regarding the project as a review and was reminded of the discrepancy. I did not have any handwritten notes supplied with my antenna, but since it was the same antenna and the same frequency, I became very concerned and started making phone calls. In the end, and at nearly the last minute, I found that my dimensions were indeed in error. On the morning of the installation, I arrived at the site a couple of hours early and readjusted all of the antenna dimensions.

The tower crew arrived much earlier than scheduled, but just as well they had a lot of prep work to do. They precisely mounted the antenna bays to a pipe and set clamps on the pipe to mount it to the tower. I gave them the bag of hose clamps to mount the power divider with. I got a funny look and

the bag was handed back without a word. They pulled a nice set of solid clamps out of their truck and assembled them on the power divider.

I shut down the station and the tower crew began their climb. The total time on the tower was 3-1/2 hours. While they were making their way down, they were attaching the transmission line to the tower and installing the ground kits along the way. Before they were off the tower, I was able to put a connector on the end of the transmission line and test the antenna. Fortunately, the SWR was very good.



The completed antenna installation on the AM tower.

After the tower crew left, I began measuring the tower impedance on the AM frequency. This was supposed to be a quick and easy measurement. It was not. I was using an old, borrowed General Radio 1606A bridge, and I could not get it to calibrate. I was about to give up, but I decided to give it one more good try. The bridge connectors were really dirty as was the one switch the bridge has. I took the bridge back to the transmitter building, put it on the bench and began cleaning it up. The cleanup did the trick. I could now get it to calibrate.

Back at the tower, I was not amused that the skywave interference had increased dramatically. I was also not happy that the sun was getting lower and the temperature was dropping. Finally, I got a solid null that I was happy with and I read the dials. The impedance was right in the range that we hoped it would be, and later found that it was nearly identical to the reading taken several years ago for the MOM proof.

We turned on the translator the following Monday after making the proper filings with the FCC. The coverage is impressive and closely matches the predictions. The equipment has been working flawlessly.

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

Snowmageddon

This year, one of our staff chose to let it snow as a Christmas card theme. Unknowingly, she also predicted the theme of this month's column. At press time, Portland appears to have dodged round three of winter storm "Snowmageddon," as the snow did not stick, and then temperatures fell as the precipitation trailed off.

Some background is in order. Portland has a reputation that, upon a rumor of the sighting of a single snowflake, all forward motion of any kind stops. Portland doesn't handle snow and ice very well at all.

On average, the Portland metro area has a snow or ice event once every 2 or 3 years. Generally, the best route up to our studio and transmitter site is a little-used section of Mt. Scott Blvd. I have used that route many times to find it generally drivable with care. That has begun to change of late.

The KKPZ north boundary is just south of the Portland city limits and just inside the Happy Valley city limits. For years, Happy Valley city hall was a converted farm house with limited city budgets. More recently, the influence of regional and Portland city governments has infected Happy Valley as they moved into a new multi-story city hall. Along with the transition has come the implementation of Portland style "services."

I have been used to driving roads to Mt. Scott that are packed snow. There is usually reasonable traction with care and a properly equipped

vehicle. Other than other unprepared drivers, I have never had much problem accessing our facility during the winter.



Two storm seasons ago, the City plowed the snow for the first time. What they accomplished was to smooth off the rough spots and create an ice rink. Last season, the roads were closed by authorities. This season, Happy Valley did put down deicer prior to the storm on access roads and bypassed many of the local Mt. Scott roads.

It turns out the deicer was a bad idea as the surface melted, creating a much worse driving surface. In Portland, the use of more "deicer" made matters much worse. The ice caused the already congested commute to extend to 2:00 AM.

At Mt. Scott Blvd., the "deiced" snow created a 10-car pileup. At Otty road, another access route to Mt. Scott, a gentle slope became a 14-car pileup as vehicle after vehicle slid gracefully down the road like a cue ball first shot breaking the table. Crunch.

In the aftermath of the Portland Snowmageddon, the renewed request for the authorities to use salt to clear roads has reached a fevered pitch. The immediate response from the planners in the metro area is, we must be "environmentally friendly," and after all, what's wrong with a few crashes?

In the spirit of the season, ho, Ho, HO!

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

December always seems to be a slow month. This past December was no different. As the year comes to a close, we tend to not start new projects until the New Year. It seems to be some sort of universal rule many companies follow.

One thing we did do in December was replace two network switches for our transmitter and Nexgen networks. The switches we replaced were originally put in when we moved to our new studio digs back in August of 2010.

One thing we have learned over the years is to spend money sooner rather than later and replace equipment before something happens. Better that than have something catastrophic happen and be stuck, possibly taking one or more stations off the air for an extended period of time. The truth is, if either of these switches were to go down, we would be off the air with all of our stations. We could possibly do a backup feed to three of the four AM sites, but that all depends on which switch failed. It is something we do not ever want to have to deal with, and if we can take precautions, why not?

The initial changing out of the switches was not hard at all. We bought some nice Cisco SG-300 managed gigabit switches and even took the time to

label each port so we would know at a quick glance what things are. The transmitter network did great. No issues at all ó everything came up and worked.



We did the Nexgen switch the next day and things happened and are still happening. It's almost like ports are not working on the switch, but it does not make any sense. We set everything up for 1000 full (rather than auto) since all our network cards can accommodate it. We noticed some studios were having issues seeing the

network. I could switch to a different port with the same exact settings and it would start working. A port that is working yesterday may not work today. We are still trying to figure out what the issue is. perhaps a simple firmware update will fix the problem.

January brings us the New Year and new projects. Thankfully, we don't have anything major planned this year. I have no doubt that the year will be filled with issues here and there and just the usual maintenance items. I always look forward to those times, otherwise it'd get real boring around here.

That about covers it for this edition. Hopefully next month I'll have something more to write about. So until next time! that's all folks!!!

The Local Oscillator
January 2017

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, 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/91.1 MHz, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Denver, CO
810 kHz/94.3 MHz, 2.2 kW-D/430 W-N, DA-2
WDCX • Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2
WDCX-FM • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDCZ • Buffalo, NY
970 kHz, 5 kW-U, DA-1
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT

WEXL • 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 • Detroit, MI
103.5 MHz, 50 kW/150m AAT
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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