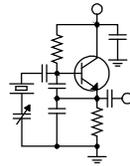


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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January Thaw

There is a weather phenomenon that occurs in January of many years that is like Indian Summer in reverse. It's called the "January Thaw." It is a "blip" in the otherwise mostly smooth temperature curve that plots like a rounded sine wave from January through December. In mid-January of many years in Colorado, we'll see a ten-degree bump in temperatures for a week or so with usually sunny skies and light winds. It's a nice break from winter, which always returns by about the third or last week of the month. (For you weather geeks, January 23 is statistically the coldest day of the year in the northern hemisphere.)

As I write this in late December (when it's -14F outside), it's much too soon to tell with any degree of certainty that there will be a January Thaw in 2023 – some years it doesn't happen or is just a small temperature bump for a couple of days. But I'm certainly hoping and praying for one. Why? Because we have several microwave links to install in January! Certainly not an optimal time to be doing that kind of thing, but it's got to happen, and sooner is better than later!

In Buffalo, we now have all the pieces and parts on hand to install the three-leg Part 101 microwave system to connect our new studio location in Amherst, NY (northwest suburban Buffalo area) to the WDCX-FM site in Boston, NY and the WDCZ(AM) site in Hamburg. We'll shoot from our studio rooftop to the 250-foot level of a nearby 400-foot tower owned by the State University of NY on 23 GHz. From there we'll use 6 GHz to get to the FM site in Boston, and then we'll shoot with another 6 GHz link west to the AM site in Hamburg. But wait! There's more! From the base of tower #5 in the 5-tower WDCZ(AM) directional array we'll shoot several hundred feet to the transmitter building with

an 802.11 Ubiquiti link. So... from studio to AM transmitter site we'll go through four RF links.

The integrator we will use in Buffalo to install and path all this is based in the Buffalo area and told me that they work in all kinds of weather and conditions, so they're not afraid of a little (or a lot of) snow. That's probably a good thing. The feet of snow that we got in the Buffalo area last month will undoubtedly still be on the ground when the project gets started.

Successful completion of the microwave link project is precedent to any further work on our studio move. We could, if we absolutely had to, complete the move and use the public internet for STL for a time, but that's not a desirable course of action. We have good, high-bandwidth internet service at the new studio, but the internet service at the transmitter sites is essentially rural residential service, shared with a lot of houses and with throughput that goes from a stream to a drip when everyone is home and streaming their favorite TV shows and movies. So we could count on lots of audio dropouts and stutters if we went that route. It's okay for a backup, but we don't want to do that to our listeners or clients.

In Denver, as of late December we have all the equipment on hand for a new Cambium 5 GHz link to the new KLDC site, some nine miles from our studio. At present we're using a Ubiquiti PowerBeam in that same band. The signal is okay – in the -70s – but we get occasional packet loss from interference. The new link will use larger antennas (3-foot 32 dBi), which will have a lot better rejection than the existing 2-foot antennas. These antennas and radios are also dual-polarity and the radios use that dual polarity as a diversity system of sorts – they will take the better, cleaner of the signals from the two polarities. I've heard good things about this, so I have high hopes.

At present, the installation is scheduled for January 10. Between now and then we have to get the studio-end antenna up on the studio roof and that radio installed and powered up. The tower crew is not responsible for that end of things. And Amanda will be out that week of the 10th, so I'll be on my own for the project.

So with those two outdoor projects in the works for early this year, we're definitely looking for a January Thaw! Here's hoping!

Export Multiplier

Our Denver Legends (oldies) station, KLVZ, operates with split day/night facilities. The day site is located north of Brighton, Colorado with 2.2 kW and a three-tower directional antenna beaming southwest into Denver. The night site is shared with KLZ and operates with 430 watts with a four-tower trapezoid array with a fat lobe to the south over Denver and a narrower lobe to the north to cover Brighton, the community of license. The station's format is the only one in town and is unique in other ways as well. As such, it and its two FM translators have a good number of listeners, day and night.

KLVZ transmits a hybrid HD-Radio signal from its day site, and for many years it also did from the night site. When the NE-IBOC first-generation HD Radio generation equipment died several years ago, we pulled the plug on HD at night on KLVZ, probably to the delight of the local DXers that like to listen to KGO, WHB and WGY. But it always bugged me that the station was digital only during the day. The 60s-70s music format lends itself well to AM digital, and we get calls when the digital is off – listeners like it.

When we dismantled the old Portland facility last year, its Exporter Plus, AM IBOC and Omnia.9 were shipped to Denver. For a time, the exporter was used in Detroit while one of theirs was being repaired, but we eventually got it back. Seeing those units sitting on the shelf at the KLZ site gave Amanda the idea that we should put them back into full-time service to get the KLVZ night facility back on in digital. So a couple of months ago, that's what we set out to do.

Right out of the gate we found that the exporter did not work. It would hang up in the boot-up cycle – not the usual hang-up that we get when the inverter electrolytics dry up and start bulging, but another issue altogether. We ended up sending it back to Nautel for repair, and it came back all fixed and ready to go.

Amanda and I installed the Omnia.9, AM IBOC and Exporter Plus and used existing cabling to

connect it to the J1000 night transmitter. But we found out fairly quickly that it didn't work. No drive. It took some poking around with an oscilloscope to figure out that the phase input transformer had a shorted wire. Fixing it was easy – just move that enameled wire a little bit. After that, we got the digital signal all tuned up with a great spectrum and solid digital performance.

I wasn't happy, however, with the analog modulation depth – we could hit 125% positive modulation easily, but were having trouble even getting to 90% negative. That took some more sleuthing. We eventually found that we had used the wrong procedure for adjusting the analog gain on the transmitter's remote interface board. The procedure we used was for the older NE-IBOC; there was a different procedure with a different target test point DC voltage for the AM IBOC. With that set properly we were able to get negative mod into the 90s. An Exgine software update got us the rest of the way there. The digital performance was excellent and the station sounded delicious in both analog and digital.

But there was an issue, minor but irritating to me. Nexgen has only four metadata exports and we were using them all: one for the day HD, one for the stream, one for the Brighton FM translator and the fourth for the Lookout Mountain FM translator. There were no slots left for the night HD, so on HD radios, we just got the default scroll. Listeners have come to expect to see title/artist information on their radio displays, so I knew that would be an irritation. How could we fix it?

The idea that I had was to throw the problem at Stephen Poole, a.k.a. "Cousin IT." There had to be a way, I told him, to intercept the packets destined for a certain IP address and port and forward them to two other IP addresses and ports. Being the steely-eyed missile man that he is, it didn't take Stephen long to come up with a Python app to do just that. He put it on a spare Raspberry Pi 4 that I had, and we hung it on the Nexgen/transmitter network, It worked like a hose! The exports that had been formerly destined for the day site exporter were directed at the Pi and from there, they were regenerated and redirected to both the day and night exporters. We had PSD on both day and night HD signals!

To put a finishing flourish on the project, Cousin IT also added "Legends" in the album title field of the exports (Nexgen's Xperi PSD export does not, for some odd reason, export album title. Now radios display title, artist and "Legends.")

We're proud of our now full-time digital Legends signal, and I'm sure our listeners are pleased.

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

Hello to all from Western New York! The month of December has been one for the record books, weather-wise.

I'm sure you have heard of the blizzard that socked the Niagara region right before Christmas. The blizzard lasted two days and nights, with 80 mph winds, frigid temperatures and lots of snow! Sadly 41 people lost their lives in this storm, most found frozen in their cars, on sidewalks or in snow drifts. Many froze to death in their homes due to downed utilities resulting in no heat. In many areas, power was not restored until five days after the storm hit.

It's too early to estimate how much property damage occurred from this storm, but I suspect it will exceed 10s of millions. Snow totals were officially 47 inches, but the winds whipped the snow into drifts in some areas exceeding 12 feet! Since winter began right before Thanksgiving, Buffalo has received 189.6 inches of snow. For the mathematically challenged, that's over 15 feet!

The Farmer's Almanac predicted that this region would experience extreme cold temperatures and above average snow. I suspect they may have underestimated snow totals a bit.

There is a lot to report on this month, so I will begin with progress on our facility move to Amherst, NY. When time has allowed, I have been busy installing new equipment in the TOC, running CAT5 and CAT6 cabling into the studios and production rooms, and completing AC requirements in the TOC, such as dedicated 20 amp circuits into the racks and a dedicated 15 amp circuit for the Internet services and phone system.

Pat Viola, our cabinet maker, had planned to have all the broadcast cabinets installed right before the Christmas holidays, but he caught an error in one of the rooms, so we decided not to rush installation and allow time to correct the mistake. We are

planning to install the new cabinets beginning January 9th.

On the morning of Wednesday, December 12th, I arrived at the site and found that the entire ceiling in the TOC had fallen and was being held up only by the wire ladder. We phoned Trinity Construction, the company that did the tenant finish work, and they came immediately to see what caused the failure. They found that the electrical sub-contractor did not support the lighting fixtures in the ceiling, and the weight of the fixtures caused the ceiling to

fall. Trinity removed all of the ceiling and replaced it with new materials and made sure that proper support was in place to keep this from happening again. They also went through the entire facility, checking each and every lighting fixture to ensure that this would not happen anywhere else.

On Saturday morning, December 10th, I received a call that the parameters on the WDCX(AM) array were way off in the day mode. I made the trip over to determine the cause of the failure. Looking at the antenna monitor, I was able to determine that the issue was at either tower #1 or #2, so I jumped into the car and drove out to the towers to investigate. I under-judged just how frozen the ground was and ended up getting stuck in the tower field. The first 20 or so feet in, the ground was fine, but as I got closer to the doghouse, my Jeep suddenly sank into pure mud, right up to the axles. I knew that there was no chance of driving out of this, so I phoned for a tow truck to winch me out. When he arrived, he assessed the situation, and he ended up getting stuck also! Eventually, they brought in a 4WD tractor, which pulled us both out with ease.

Now back to the reason for being there in the first place. One of the solenoids in the RF contactor at tower #1 failed, keeping the switch in night mode when switched to day. I put the entire array in night mode and disabled the macro in the





The ballasted non-penetrating roof mount for our C-band antenna was about all that was holding the roof on at the studio building.

Burk remote control so it would not switch until I received the parts from Kintronics.

About three or four days later, I came down with a severe lung infection, very similar to the one I got last year in late November. There is a lot of mold and fungus in the grass at this site, and that is probably what caused the infection, I was breathing in the mold as I walked through the field. This time it was much more severe, and it kept me down for weeks. As of this writing, I am better, but breathing is still labored, and I have had to undergo a second round of stronger antibiotics to knock the infection out.

At the WDCX-FM transmitter site, we lost the Omnia.11 audio processor on the evening of the 26th. We were in the middle of a driving ban, as the snow from the blizzard had most all roads impassible, and it took me over two hours to make the trip out to the transmitter site. Each route I took, it was not long until I had to re-route as the road was drifted with 6-8 foot drifts, or it was blocked by abandoned cars and trucks. It is normally a 26 mile drive; I drove almost 48 miles just to get to the site!

The Omnia.11 was dead, would not boot up, so I pulled the Omnia 6EX from the HD-2 stream and installed it on the main air chain. After hooking it up, I found that the AES output of the processor was dead! To get us back on the air, I installed our Flying Cow A/D converter to the output of the STL and fed the digital signal to the input of the exciter of the NV-40, then set the audio level for 100% modulation. This would buy me time until I could get to the studio and pull the old Omnia-FM out of the studio rack and install it at the transmitter.



Roof decking and membrane piled up against the pole supporting two paraflectors.

I tried to get to the studios, but the streets downtown were impassible. There was no open route to the station, so the installation of the Omnia-FM would have to wait until I could safely get to the studios. It was Thursday the 29th before the city road department had roads minimally cleared downtown. As no-one was able to enter the building since the blizzard began on Friday the 23rd, we were not aware that the 80 mph winds had torn most all the roof off the building on Delaware Avenue. The 4th floor was virtually destroyed from water leaking down from the exposed roof, fortunately, we had minimal water damage to the ceiling of the 3rd floor, where our studios and offices are located. It is truly a blessing that we soon will be out of this old building for good!

In the next few days, Transwave Communications will begin installation of our new Part 101 6/23 GHz microwave system for WDCX and WDCZ. I'll have more information on this in next month's report.

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, and Happy New Year!

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

Oh Snap!!

For the first time in my days as a broadcast engineer, some 37ish years, I've experienced the failure of a guy wire on a tower. That said, it wasn't due to strain, age, ice, corrosion – none of the usual suspects. No, it was snapped due to a collision with a combine.

The fields at our WRDT transmitter site are vast, some 56 acres of land divided by a swale and most of which are farmed. Nothing too extreme, no corn or wheat, just soybeans and occasionally hay is grown and harvested by a nearby farmer who is normally invisible to our operations and relieves us of the overwhelming task of mowing.

This year our friendly farmer has not been so inconspicuous. Early in the spring while operating his enormous ag-track bearing Case tractor, he accidentally clipped one of the tower enclosure fences tearing the corner pole straight from the ground. For his next feat of strength, this fall he managed to snap a guy wire while harvesting with his combine.

The wire is really not a wire at all. In fact, it is what's called Phillystran. Phillystran is a plastic-coated synthetic fiber cable that is a great alternative to wire. In addition to being strong, corrosion proof, and light weight, it is also an insulator making it ideal for tower guying. The type we have at this guy is ½" and has a 27,000 lb. rated break strength. Considering that manufacturers generally derate to include a safety margin I'm guessing it took nearly 30,000 lbs. to break this thing! Wow!

Fortunately, no one was hurt and the tower and combine appear to have taken it in stride. Once spring gets here, we'll replace the temporary wire we had our local tower crew install and give the tower a thorough inspection to assure no other damage exists.

Remote Control Redo

Probably just about everyone reading this is familiar with the extensive remote-control systems employed at radio stations. Remote controls enable monitoring, fail-over, alarm reporting, and of course, control over the many diverse systems required to

reliably run radio facilities. The system we use is the Burk ARC Plus. ARC Plus provides the three essentials: status, metering, and control, along with alarm reporting, the ability to run macros and scripts (flow charts) and it has available SNMP support.

SNMP is incredibly useful, but sometimes difficult to implement. I've got one piece of equipment that supports it, but the manufacturer doesn't know what I'm asking for when I request the MIB.

The MIB, or Management Information Base, is a crucial component of SNMP, allowing the person setting up SNMP communications to find the OID corresponding to the data point or command they are implementing.

Frustrating as that is, inside our Monroe, Michigan 560 WRDT transmitter site, the remote control system has been converted, reverted, subverted, and inverted to the point where I just couldn't work with it any longer. This is no fault of the Burk ARC Plus system. To the contrary. When the Gentner GSC3000 system was no longer up to the task, Burk made adaptors available so that station personnel would not have to rewire their remote-control systems to install Burk's ArcPlus. The Plus-X GSC Adapter simply took the 37-pin connectors from the GSC wiring panels and made them available to ARC Plus via IP. We have a few of these units, and they work beautifully. However, they do "enable" engineers to kick the proverbial decades old rat's nest of wires down the road.

The incentive for tearing nearly every bit of this 'nest' out was the redo of the site's tower lighting monitors (TLMs). A few months ago, I wrote about moving the TLMs from the towers into the tuning houses. Doing this allowed me to access all of the GPIO functions on the TLM circuit boards and bring them back to the transmitter building via the underground cabling. While doing this, I quickly realized that the remote control system's wiring was indecipherable and impossible to follow or easily access.

I hope to have much of this rewiring done by spring and have a much more capable and flexible system afterward.



Short but Not Sweet!

Audio processors are pretty reliable and don't tend to cause vexing problems too often. I should remind myself of these words whenever I start chasing problems that lead me to one of these boxes. That said, sometimes they are the guilty party and need to go back home to be made to work again.

Recently, the processor we have in standby service on WMUZ 103.5FM stopped talking on the network and had to be returned for service. This left available only our primary unit, which is connected to our Nautel NV40 using AES192, which is, simply put, MPX (or composite audio) over AES.

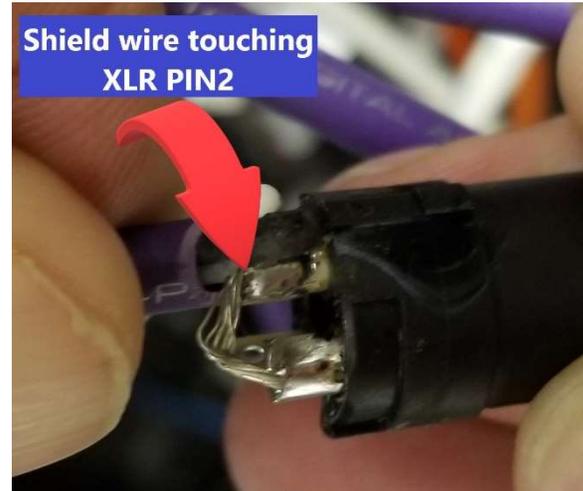
To accomplish this, the processor has a dedicated AES192 output jack to which we connected a Gepco 110-ohm wire leading to the NV40's exciter. This connection has been in service for three plus years without issue until Christmas Eve, when it stopped working completely and mysteriously.

Fortunately, I had supplied our Nautel NV40 with a tertiary composite MPX audio source from a very old but functional processor that I use to feed our backup transmitter. This kept us on the air in the intervening time while I traveled to the studio and ran down the problem.

I prefer to keep backup equipment connected in parallel chains. This way, simply by changing transmitters, one bypasses a vast number of possible failure points. I relocated the audio processor to inside the transmitter room and everything worked as it should.

On the Tuesday after Christmas, I returned to work and set about finding the cause of the mysterious non-working wire. AES192 is not very

pervasive, so I had no way to check its validity either by sending another known-good source into the



transmitter or by analyzing the output of the processor.

While testing, I found that the roughly 60-foot length of Gepco DS401 no longer allowed transmission of any AES signal, and looking further, I could see it was in fact shorted between shield and the black signal wire. I finally located the short inside an XLR connector that has been in service and undisturbed for years. The shield wire was folded just to a point where it could touch pin 2 on the connector. Why it decided to make sufficient contact when it did, I don't have a clue.

I love to crack open a good mystery, but how this worked perfectly for over three years and failed on Christmas Eve isn't one I'd care to read again!

News from the South
by
Todd Dixon, CBRE
Chief Engineer, CBC–Alabama

Iron Ore Mountains, Lightning and Big Metal Sticks

I took a couple vacation days in early December for a yearly “family” Christmas get together with my family, my mother, and my brothers and their families. The weather forecast ended up being a little more severe than I’d like, but everything seemed to continue running fine without even a blip from our SNMP monitoring.

When I got back, we were getting several emails reporting tripping of the silence sensor alarms we have set up in our Inovonics 531N. I always check them, even though the poor Inovonics monitor cries wolf way more often than not or simply needs a reboot. My normal routine is to log into Nexgen and check the control room screen and then log into our Nautel transmitter to check for modulation and power.



Figure 1 - The Drone made it easier to see what antenna bays were affected.

On this occasion, I was about to close out the transmitter login when I saw the reflected power around 450 watts and our forward power down about 300 watts from normal. Typically, the reflected for the WDJC GV40 is around 45 watts.

I got on our PRTG monitor and saw the graphs of when the high reflected power started. The values were wavering between 200 and 450, coincident with the wet weather we were experiencing.

Next, I flew the tower with our DJI drone

and got some decent pictures of all of the bays.

When I called ERI, they suggested replacing four bay arms on the antenna and they got them to us in pretty short order. We had a couple of different work days from our local tower crew, and we probably have one more day of work to get our main antenna back up to snuff.

Of course, nobody gets the option of deciding when these types of things happen, and when you mix in the Christmas and New Year’s holidays along with some biting cold that Birmingham, Alabama is not really accustomed to, it makes it a challenge to get the work finished. We should be back up on our main antenna right after the new year starts.

On a positive note, between our quarterly tower inspections and this issue, I got a lot of practice in hovering the drone six feet away from our antenna at 700 feet above ground level! It takes more nerve than you might expect, but the drone got some fantastic high-resolution pictures that really helped us figure out what was going on before and during this antenna burnout.

ChatGPT and What You’re About to Read

There’s no doubt in my mind that the engineer types that read *The Local Oscillator* have at least heard of Artificial Intelligence (AI). Probably some of you have even felt like at times that you’ve worked with someone whose intelligence was artificial at best... The truth is that we’ve heard about it, but many of us have never had an opportunity to really work with it, until now.

A couple of computer people that I follow on YouTube made several videos about ChatGPT. Essentially, ChatGPT is the Google search engine on steroids. You can ask it to do any number of things and put a number of parameters in place that it will stay within. For instance, I ask it to write me a 500-word article for the Crawford Broadcasting Company *Local Oscillator* monthly publication about our antenna burnout. It’s up to you to decide whether that is what you were reading previously or not.

[Spoiler alert! You would have been able to

tell that it wasn't my normally witty, astute writing style...or could you?]

At this point, your decision is probably hinging on whether you think I even know what the word *astute* means.

The truth is that this is really powerful (and scary) technology. I've heard a number of stories about students using it to churn out five-paragraph essays or research papers written in MLA formatting, and I've seen the software create pictures by simply giving it a description of what you'd like to see.

Since the search requires so much more computer horsepower, it stands to reason that it costs more per search to accomplish what you ask it to find or do. Also, if you're wondering whether this will be another computer fad or not, I saw that the CEO of Google told their teams that they need to double down to create a product with the same feature set. So, the 800-pound gorilla is about to jump in the ring to bring the technology to everyone.

You might ask how I have used it. I ask it to write a sixty second radio advertising spot for a mechanic that advertises with us. Thirty seconds later, I had something written in front of me that included phone numbers, their website and a host of essential details about the services they provide, and it wasn't bad writing.

I've mentioned here previously about our mysterious WDJC-FM ASERV disconnections from our Nexgen database servers. It's random and the simple fix is to simply restart Nexgen. I've gone through our settings and hardware too many times to count. RCS doesn't have anything in their files about any other station this has ever happens to except our station. In the LocalViewer file in the HLC directory, when WDJC bites the dust there is always a text string like the following:

“***** Database Error - all retries used”

It occurred to me that if that string is always present, that is an indicator that I know the ASERV

has dissociated itself from the Nexgen network. Of all of the things I am regarding computers, I'm not a programmer or a script writer, but if I ask ChatGPT, I can be. I asked it to write a Microsoft Powershell script that will monitor the LocalViewer file, and if it sees the text string above, it will shut down Nexgen, wait five seconds, and then restart Nexgen. Voila! I tweaked the generic variables that ChatGPT gave me regarding the location of the Localviewer file, the Nexgen executable and the text string, and the script was generated.

Since Stephen is a programmer, I sent this script to him to see if he could see anything that was completely wrong, and he told me that everything looked okay. I'm going to place WDJC in Emergency Control Room and run the script on the ASERV and I'll see how it responds. If it responds as I think it will, we'll at least have a way to quickly recover when this issue occurs in a more automatic way.

In case you're worried about the implications that ChatGPT presents, I did ask it if ChatGPT will eventually take over the role of the radio engineer and this is the response I got:

“It is possible that artificial intelligence and machine learning techniques could be used to assist with tasks performed by radio engineers, but it is unlikely that they will completely replace the need for human expertise in the field. Radio engineering involves a complex mix of technical knowledge, problem-solving skills, and practical experience, which cannot be fully replicated by a machine. In addition, there are many aspects of radio engineering that involve decision-making and creativity, which are difficult to automate. While ChatGPT and other artificial intelligence systems may be able to perform some tasks related to radio engineering, they are unlikely to fully replace the need for human radio engineers.”

I hope all of you are looking forward to what the Lord has in store for you in 2023 as I am. We'll visit again next month.

Tales From Cousin IT
by
Stephen Poole, CBRE, AMD
CBC Corporate IT Specialist

Welcome to 2023! I pray that all y'all (a little Alabaman for you, there) have a blessed and beautiful year ahead of you. I continue to transition into my "IT-ness" with the company; some issues at WDJC and a severe cold snap kind of knocked me off my stride in December.

As always, I'll start with the weather. I suspect Brian Cunningham is the current front runner in the "Most Likely To Become A Snowman" competition. He's been posting some pictures on Facebook of the mountains of snow that they've gotten Up Nawth in Buffalo. The weather service predicted that we might have some snow and ice here from the same weather system, so naturally, everyone went insane and bought up all the bread and milk.

No, I don't know why bread and milk are the Official Survival Foods in the South. But it always happens. Figure 1 is a picture that I took inside of a brand new DG Market store that had their grand opening just as the winter weather was expected to hit. I took that photo around lunchtime, and they were



Figure 1 - Winter storm in Alabama: No bread for you!

already completely out of bread. If you have good eyes, you can see that there were some Little Debbie snack cakes to choose from, but if you wanted bread, you were out of luck. No loaves, no rolls, no buns, nada, nothing.

Fortunately, aside from being bitterly cold (9 degrees with wind chills well below zero), we made it with only a few problems. We did get a bit of icing at 101.1 in Cullman (which is the farthest north of all our stations in Alabama), so the

power was reduced. The big problem was that Cullman Electric Co-op, our utility supplier up there,

was obviously overloaded. Plus, TVA (who supplies them) was wailing and pronouncing anathemas on people who actually used their electricity. The power in Cullman kept popping on and off due to the local grid being overloaded. So, in the middle of all this, Todd and I had to add some fuel to the generator at 101.1 FM.



I've said it before: Alabama just ain't wired for this. We don't bury our pipes deeply enough to guarantee that they won't freeze when we get into single-digit temps. Adding to the hilarity this time, though, is that the water utilities were warning people not to let their faucets drip overnight.

"Open your sink cabinet doors instead!" Nice idea, but it does not work if you have long pipe lengths and a deep crawl space. Ask me how I know.

Ever since I was a little itty-bitty boy, that has been standard practice: find the faucet that's farthest from the meter or pump and just barely crack the valve. Works like a champ, your pipes are less likely to freeze and life rolls on happily. But the water suppliers here said that this wastes water and besides, their system pressure might drop because of everyone dripping. Whatever.

Programming

I've downloaded the latest version of Microsoft's Visual Studio for evaluation. So far, well ... I'm not sure. When they first introduced this thing over two decades ago, it's was finer than frog hair. It came for free with Microsoft Visual C++, Visual Basic and some other packages. You could go into the GUI builder component, construct all your little dialogs and windows the way you wanted them, and then just click each item to "tie" it to some code that would do what you wanted. Slick, simple, easy.

Nowadays, though, because it tries to be All Things To All People, and because they're targeting a different audience (.NET and C#), it's loaded with stuff that I'll never use. It doesn't help that things have changed and have moved around (I thought that only the Open Source folks did that!). The learning curve is a lot steeper than I expected. The biggest surprise, though, was that I had separately download C++ support, and I had to hunt for a way to create a

simple Windows GUI application. And finally, just to complete this whine, C++ itself has changed and is more complex than it used to be when I was programming with it back in the 1990s.

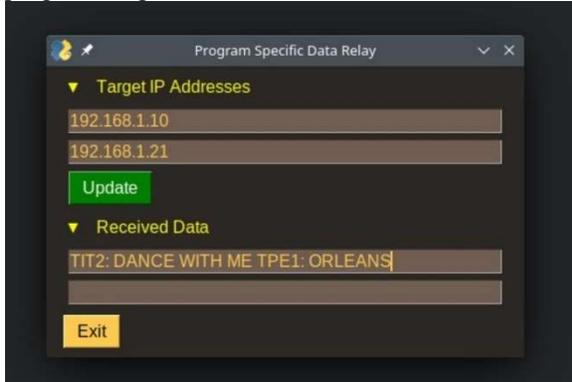


Figure 2 - Testing the GUI version of the PSD relay.

As a result, I'm writing a lot of stuff in Python now. It has an odd-looking syntax for an old C/C++ guy like me, but it's not hard to learn. Better yet, there are libraries to do just about everything you could want – including a relatively simple GUI framework (see Figure 2, where I'm testing a Windows-based PSD relay). Best of all, it will run anywhere that you can install a Python runtime: Windows, MAC, Linux, Raspberry Pi, toasters, hair dryers ... (OK, I'm exaggerating a bit). There's tons of support and free code samples online, too.

The only thing about Python is that, by default, it crashes to a halt if there's any kind of an error. It reminds me of the old days, programming in BASIC on a DOS PC: if anything went wrong, the program would just bail out to a DOS prompt with an ugly error message. But unlike those ancient dialects of BASIC, you can add "try/except" blocks in your Python program that will allow you to recover from a minor error (such as "File not Found"). You simply say, "Here, try this," and then add a few "except" to smoothly catch any errors. Kindof clunky, but it works, and "try/catch/except" (or so-called "structured exception handling") makes the Neck Bearded Geeks all moist-eyed and dreamy, so there you go. Again: whatever.

WDJC Antenna Saga

I'll let Todd give the detailed report on this; as I write it, though, he's still waiting for the tower crew to reschedule a look at WDJC's main antenna. I mentioned this in the previous issue; we were apparently hit by lightning, and Todd had noticed an increase in reflected power. He used the drone to take closeups of the antenna bays and determined that the top bay had been popped (Figure 3). He ordered replacement arms from ERI, and we suspected that the tower crew forgot an O-ring, because we had an air leak. (Sigh.)



Figure 3 - Uh, oh. This can't be good ...

By the way, this same crew managed to drop a connecting inner from inside one of the bays. It fell 650 feet to the ground and has never since been found. Fortunately, ERI had a spare in stock as well, but that caused another delay. Then the bitterly cold weather came in, and ... well, that's priority one in the new year. For now, we're at full power with HD on the aux antenna, so we're on air, thank the Lord.

That's it for this time; short and sweet. I'll be headed to the Carolinas over the New Year's weekend. I had originally planned to go over Christmas, but see above re: weather and icing. Again, I hope everyone has a splendid and blessed 2023.

Until the next issue, keep praying for this nation!

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

As I write this, the New Year is just about here. Of course, most of us usually have positive hopes for the New Year. After the last three years, we may now take a wait-and-see approach or even be bracing for what comes next.

I am usually the proverbial “glass half full” kind of person for the most part. I like to “count my blessings” rather than focus on the negatives. As we start 2023, we’re all hoping that the COVID 19 pandemic will continue to decline. Most of us are also looking for a slowdown in inflation. I just paid \$5 for a dozen eggs. I never thought I would do that in my lifetime.

Aside from all the personal struggles with our economy that affect us all, on a professional level, I am hoping that 2023 will bring about some return to normalcy of the supply chain issues that we have been experiencing for the last two years but most especially in 2022.

As we started 2022, we were already waiting at least three weeks for an emergency replacement computer for one of VOX Pro setups. This computer didn’t actually show up until March. That would have been fine because we limped along until then, but the computer had lots of issues. We eventually had to get another computer in its place, which stretched this out even more. By the way, this computer is still having issues, but that’s another story.

That was the beginning of my education on the 2022 supply chain issues that were heading my way and pretty much everybody else in this industry and others as well.

My next awakening was the new generator

we had planned for our Burnham, Illinois transmitter site. We ordered the new generator in early February. The original expectation for delivery was in late March. By the middle of March I received an email that order was now expected in late June to early July. Now, when that timeframe came around I was not surprised when received news that the delivery date was now set for January 2023.

The last time I spoke with them, they were able to tell me that January was not going to happen and they were not able to put an estimate on a delivery date but were expecting that March 2023 was a possibility. I have a new fear to even ask them for a delivery date. It just gets so depressing

Another situation that has been just as exasperating, back in

March, we lost the Ethernet cable to one of our Bullet-M Ethernet radio installations on the Beecher, Illinois tower. That cable was full of water. The Bullet-M installations were one of the last microwave Ethernet setups on which we had not installed direct burial CAT6 cables. I should have given that higher priority a few years ago. Hindsight is 2020, and who saw 2020 coming. We ordered the CAT6 cable in early April, and the latest delivery date now is in March, nearly a year later. My guess is that we will probably see an even later date on this one. Now I am sounding like the “glass half empty” person but experience has made me much more guarded.

These are few examples of the issues we have faced over the last year, and I am sure that there are many that could top these. My New Year’s resolution is to not say, “supply chain issues” by 2024. Like most New Year’s resolutions, this will probably not happen.



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

Happy new year to everyone! I hope the holiday season wasn't too stressful and that each of you got to relax some. I took the week off after Christmas to end my year, and it was much needed. I may have worked a little bit, as some issues came up, but nothing too difficult.

Mod Monitor Repairs

December is normally a quiet month. We don't like to start new projects as they should, for the most part, be done by that point. I spent part of the month working on minor projects. One was to replace some of the LED bar graph arrays in the DaySequerra M2 Modulation monitors at the sites and then connect them using a splitter so we can see the HD info as well as still use our Inovonics modulation monitors. This has worked nicely for us, and now that we've done it, I really have no clue why we didn't do this before. The LED arrays purchased were not an exact match to what was in the DaySequerra units before, but by unsoldering a couple of things on some units, we were able to plug in the new arrays without issue.

Wind is Not Your Friend

We did have one somewhat major thing happen at KLTT. On the afternoon of December 8th, a very windy day, I got notice that the station was off the air. I dug into it and quickly realized the power was out. I reported it to the utility and waited at the office for a bit before making the decision to go ahead and head to the site.

It was miserable as the wind gusts were making driving difficult. Even getting the gate open and getting into the building was very difficult as the wind was basically blowing the door shut as I was trying to pull it open. The power was still out, and since I couldn't do any of the work I had planned (the modulation monitor repair), I went to a nearby Lowe's to grab some needed items for our other site up that way (KLVZ-Day). The plan was to go ahead and go over to KLVZ to get the work done there and then head back to KLTT when the power was

restored.

While I was at Lowe's the power came back on, so I went back to the site to check on things. We had just one piece of equipment that did not come back up, the AM-IBOC Exciter for the ND-50 (aux transmitter). After a few reboots and the unit still not responding, I took it out of the rack to bring back to the office. I did the repair to the mod monitor and a couple other things before calling it a day. After troubleshooting with Nautel, we found the issue to be the Exgine.

With the unit open and on, we could see the LAN light flashing green on that card and then going out like there was nothing plugged in. After replacing the Exgine in the unit, it all came back up happy and is now back in service at the site. We are grateful it was a fairly easy fix and that we didn't have to waste time sending it in for repair.

Upcoming

January will be a slow month for me. I will be in the office for five days after the New Year, and then will have my tonsils out. This will keep me out of the office for at least a week. Doctors are saying I need three full weeks off work but who can do that in this day and age? My plan is to take the week of surgery off and then see how I feel. Hopefully I can function enough to be at the office and get some work done.

Because of the surgery and recovery there's no telling what I will get to do in January. I have nothing planned. Perhaps getting our alarm systems at KLTT and KLVZ replaced, but I don't necessarily have to be on site for that. Only time will tell what the month will bring.

Our local SBE chapter will be hosting a lunch meeting January 18 at our conference room. Jay Tyler from Wheatstone will be here and it is sure to be a great meeting. If any of you are local or are in town, let me know a day or two in advance so I can get an accurate head count. We would love to have you join us! I pray you all stay safe and well.



The Local Oscillator
January 2023

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

KLZ • Denver, CO
560 kHz/100.3 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 • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

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

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



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