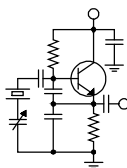


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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Another One in the Books

It hardly seems possible, but we're about to close the books on another year. 2022 was... a little weird. It was a lot more toward "normal" (whatever that is) than 2021, but it was still a little off.

For example, lead times on equipment, while generally better than they were a year ago, have settled in at a new normal that requires some thought and planning. One rather egregious (but not uncommon) example is a generator that we ordered a year ago this month. We're still waiting and are likely to be for some time now. Another example is the Cisco core switches (3560s) that we ordered for the new Buffalo studios last June. Yep, still waiting. The same goes for two three-foot 6 GHz antennas we ordered for Buffalo last summer. And for a pair of Cambium PTP450 5 GHz radios we ordered months ago for KLDC.

What all this means is that we have to think ahead – way ahead. We have to order some things a year in advance of the need, and that means we have to plan a couple of years out to be sure we get the order placed so that we have the item when we need it. Such was the case with the Detroit studio/FM site generator. We ordered it in October and don't expect delivery until late next year (we're renting a generator to get us by until then). The same goes for HVAC equipment. Some items are in stock and can be had fairly quickly, but most are not and we have to either plan way ahead or compromise.

The reasons for this are still a mystery to me. I've heard all kinds of things, from labor shortages to chip shortages (caused by a factory fire or worker walkout or UFOs beaming up workers or raw materials) to container ships being unable to unload due to the unavailability of port space. Maybe it's some of all these factors (except maybe the UFO thing, but then again...). Personally, and I base this on what I have seen with my own eyes in recent

months, I think it's worker shortages. The COVID lockdown has produced a whole segment of the workforce that is no longer willing to work. It's hard to crank out widgets without workers, and those that are willing to work have to do multiple jobs and work longer hours.

I wish that we could look forward to 2023 as a new page in the book, one in which everything is all better and back to normal, but that's not going to happen. It's going to take years for things to settle out, and my guess is that we'll never get back to where we were before. Don't get me wrong... I'm not being a Gloomy Gus here; I'm just facing reality. We're going to have to continue to adapt and plan ahead.

When you think about it, what we're facing now isn't all that different from the way we operated 30 years ago. We placed orders and we waited, especially on the big stuff – transmitters, antennas, boards, etc. And we didn't give it a thought. It was the norm back then. We made allowances for lead times. We've gotten spoiled in our internet/Amazon/FedEx culture, where we can (or more accurately, could) get just about anything in a day or two. Some things are still available right away, but many are not. Our challenge is to figure out which is which in plenty of time to compensate.

And so we close out 2022 carrying over a number of things to 2023. We're going to have to get used to it.

What We Got Done

This year has been one of progress in projects all over the company. A few highlights...

- In Detroit, we remodeled the talk studio with all new finishes and new studio cabinets. The room is a real showplace now, one that I'm

sure Bob Dutko and our other hosts are very pleased with.

- In Buffalo, we got the tenant finish done on our new leasehold. Everything is in place and ready for the move. At this point we're waiting on some equipment and installation of the three-leg microwave system.
- In Denver we got KLDC moved to a new diplexed site. The move has resulted in a much better signal day and night and a much healthier transmitter site.
- In Denver and several other markets we have made wholesale conversion to LED lighting at our transmitter sites.
- We have greatly improved our cybersecurity company wide.
- We upgraded our microwave links in several markets, replacing older, obsolete equipment with new Cambium gear.
- We replaced Nexgen workstations in most of our markets.
- We upgraded our backup HD Radio equipment in Chicago.

In addition to all that, we continued with day-to-day maintenance of our equipment, always looking for ways to make improvements. In Chicago, for instance, we now have Wheatnet running over a Part 101 microwave link, which allows us to route directly to the processor input at the transmitter site. In Detroit, Mike came up with a way to improve tower light monitoring at one of our sites.

So, 2022 has in no way been a slack year. We got a lot done, and we're not done yet. We'll hit the ground running in 2023.

Welcome!

Please join me in welcoming Selena Holdridge to our team! Selena came aboard as the new Corporate Engineering Executive Assistant in early November and she has been in training since. She's learning our systems and processes as well as getting acquainted with our people across the company. She has jumped right in and developed her own systems and reorganized things to her (and my) liking. I very much look forward to seeing her grow into this position and take back over all the tasks that Elizabeth McGuire did so faithfully for many years.

Selena's email address is sholdridge@crawfordbroadcasting.com. Please

contact and interface with her as you did with Elizabeth, and extend her every courtesy as she settles in.

The KLDC Story

Be on the lookout for the December issue of *Radio World Engineering Extra*. That issue will feature Part 1 of the detailed account of the KLDC site move. Amanda and I provide the whole story, from learning that our lease at Ruby Hill would not be renewed to the initial KLZ/KLVZ-N collocation plan to finding the KGNU site and negotiating a lease for that location to the design, construction, installation and tune-up of the diplexer at that site. Part 1 will deal with the planning phase, and Part 2, which will appear in the February issue, will detail the construction, move and tune-up.

We continue to be pleased with and amazed at the performance of that station at the new site. The signal is far better than it ever was at Ruby Hill day and night, and the digital performance is probably the best I have ever seen.

We're still awaiting a solution to the RF monitor output issue that I described in last month's *Local Oscillator*, and Nautel Support assures me that a fix is in the works. In the meantime, we're using an "antenna" (short piece of #24 solid wire) on the Inovonics monitor to get an RF sample both day and night. We use that monitor as a silence and RF loss detector in addition to maintaining proper mod levels, so it's important that it have a good sample.

KLVZ Night HD

One other project that we did in November was converting the KLVZ night facility, collocated with the KLZ site, to HD. We had that J1000 transmitter running in HD for several years using the old NE-IBOC, but when that unit died it went back to analog. Last month we took the Exporter Plus and AM-IBOC and used them to feed the J1000. We had to solve an issue with the phase signal input transformer in the J1000, but with that fixed, it tuned right up with a great spectrum and great digital performance.

Why would night HD be important for that station? With its oldies format the only game in town, we have a lot of listeners in HD, and they notice when it's analog. We can now provide them with a beautiful, crystal-clear HD signal 24 hours a day.

The New York Minutes

By

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

Hello to all from snowy Western New York! I'm certain that most of you have seen or heard on television about the winter storm that hammered western New York right before Thanksgiving. Forecasters were predicting this storm almost seven days before it materialized, so we had plenty of time to prepare ahead of time.

Buffalo is used to heavy and deep (measured in feet) snowfalls – that is pretty common for our region – but the intensity of this storm was unlike anything I have seen in over 30 years!

At one point on Friday the 18th, snow was falling at the rate of six inches per hour. City and state road crews could not keep up with the amount of snow accumulating on the roads and highways. The New York State Governor shut down all major State and Federal highways so plows could stay ahead of the snow, but that idea grossly failed. The bright side of this is that no-one lost their life stranded alongside the highway.

Official storm totals were 81.6 inches at our WDCZ transmitter site in Hamburg, 80 inches at the WDCX-FM transmitter site, and 68 inches at my home in West Seneca, just south of Buffalo.

On Monday the 14th, ahead of the storm, I phoned Noco Fuel to have diesel fuel delivered to the WDCX-FM transmitter site so we could top-off the generator's fuel tank. They said they were swamped with deliveries and would get us on the list to deliver as soon as possible.

When the storm began late Wednesday, I phoned Noco again to see if our delivery could be expedited, as we only had approximately one-half of a 325-gallon tank of fuel on hand. If we were to lose power for several days, this would not be enough fuel to keep us on the air for an extended amount of time. I was told that the fuel delivery drivers were working as late as 10:00 PM to get all of their customers serviced, and we would get a call when they were going to deliver to us.

I received that call at 10:26 AM on Friday the 18th, when snow was falling the hardest! My vehicle, at that time was buried under about three feet

of snow, a driving ban had been issued throughout Erie County, and they want to deliver fuel?

After a short conversation, I found that he was calling from Niagara County, north of Buffalo, where they had sunshine and not a flake of snow!

Needless to say, we did not get our fuel delivered that day, nor the next, and the next day after that. They were finally able to get to us mid-afternoon on Wednesday the 23rd. Thankfully we did not experience any power outages from

the storm, so we dodged the bullet this time! Thank You Lord!!

We did lose power at the WDCX(AM) site in Rochester for about 50 minutes on Sunday the 20th for unknown reasons. Rochester was totally unaffected by this storm, and National Grid (the power utility) did not provide us with a reason for the outage.

The Generac generator did not start up when the commercial power went down, so I will have to investigate the cause of this failure next trip over. I did manually start the genset on my maintenance visit on the 8th, and everything was normal: oil, water and fuel levels were good, and the battery seemed to have ample charge.



More than 81 inches of snow was recorded at the WDCZ transmitter site on the east shore of Lake Erie.

I keep a trickle charger on the battery, as there is not a battery warmer on this model of generator. I suspect that the charger has failed, and with the colder weather creeping in, the battery power decreased just enough to prohibit starting. The battery was replaced about two years ago, but newer batteries do fail, so I'll have to pull it and have it checked out at CARQUEST Auto Parts.

At the WDCX-FM transmitter site, we had a small glitch in commercial power about 3:30 AM the morning of the 16th. This glitch caused one of the RF driver modules in PA amp #9 to fail in the Nautel NV-40 transmitter. I replaced the faulty PA amp board and the transmitter returned to full power.

At some point either later that night or early the next morning, the HD signals went down, taking HD-1 and HD-2 off the air. A simple reboot of the importer/exporter took care of that issue.

With the exception of a few internet outages at the WDCZ transmitter site last month, things have otherwise been relatively quiet. I have been busy working on numerous projects for the studio move next spring, such as the data link dish installation from tower #5 in Hamburg to the building, and

numerous items in the TOC at the new studio site. Things are coming together, and the more I can do ahead of time, the smoother the transition will go.

Pat Viola, our broadcast cabinetmaker, reports that the cabinets are near completion, and he wants to install all four rooms sometime in the next few weeks.

We had a slight delay due to supply issues from the laminate supplier. The base color of laminate we chose for the cabinet bases did not match from sheet to sheet. Evidently, they shipped sheets of laminate made from different manufacturing batches and they did not match color-wise, so the oddball sheets had to be shipped back, and color-matched sheets sent as replacement.

Once the cabinets have been installed, I will get as much pre-install work done as I can, before the install crew arrives from InRush Broadcast Services to assist me in moving the studios from downtown Buffalo to Amherst, about 10 miles away.

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 merry Christmas and happy engineering!

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

Giving Thanks

Whether you follow politics or not, I'm sure you're thankful that the midterm elections are behind us – I know I am! I am also genuinely grateful for the days I spend here at Crawford. Working in the radio biz has always felt like a privilege, and I'm keenly aware that the converse exists for many who work day to day at jobs that neither inspire nor reward them. Gratitude is free and feeds one's spirit. I heartily recommend it!

Winterizing

It was 54° the day before I wrote this, so up went the Christmas lights and I finished cutting back some plants in the garden. I took advantage of some even warmer days early in November to prepare for the impending winter at the transmitter sites. I removed the front and rear attachments from the tractor and crammed it and its



little brother into the back room of the transmitter building. A few other items will have to endure winter's fury under tarps. I took delivery of some new doors for the west side of the building because rust and wind pressure have destroyed the internal structure of the old ones. The new doors will be supported by continuous hinges with slide-bolts at the top and canes at the floor.

For another pre-winter effort, I have installed a few more thermostats around the office. We've been slowly replacing thermostats with the Emerson Sensi smart thermostats. These are absolutely perfect for an office environment and have fallen in price to just under \$80. As I reported before, these give a building manager the ability to control various aspects of HVAC that heretofore were not possible or left in the hands of whomever happened to touch the thermostat last. I use the programming feature to

setback areas when they are unoccupied. I also use the feature that runs the fan for a minimum amount of time each hour. This better satisfies areas outside of the thermostat's general area. Setting max and minimum temperature limits is another. This stops people getting a bit too hot and running the thermostat down to 60° and by the time it gets there, the next person will jam it up to 80°. They can also be locked entirely.

The Detroit studio building has ten, yes ten (!) HVAC units, some of which have thermostats located apart from the areas they heat and cool. Don't ask me how this got done, but it makes it all the more important to keep zone temperatures even. If you setback a zone that physically contains a thermostat that controls a zone other than the one it is installed in, havoc will ensue. I might desire to setback zone 1 to save heating costs while that area is unoccupied, but the stat for zone 4 will get cold and start overheating the zone 4 offices! I've also found several zones that have two-stage HVAC units where the second stage control wire was simply disconnected at the stat because someone didn't install a correct for the application, two-stage thermostat.

Where Are Our HVAC Units?

Lead times are unbelievably long these days. I ordered a wall-mounted HVAC for WCHB's transmitter building over a year ago. It just arrived at the end of November, and its installation should be complete by the time you read this. I have another unit that's been on order since last year that's now not due to arrive until February!

STL Issues

The ability to send audio to transmitter sites over the internet has become a standard more than an alternative. We have redundant STL systems in place that are configured to separate audio and network pathways. If one dies for whatever reason, the other can be automatically brought online. I've been working toward having each backup system's status monitored by our Burk ARC Plus remote control system. Some of the units we use have GPO available which can be set to change states if the unit loses audio or connection, which opens a closed loop monitored by the Burk which in turn sends an alert. This seems foolproof save for one thing – it can't sense audio quality.

Recently, one of our overnight staff let the audio go silent, triggering the cascade of audio patch changes that brings on our backup STL equipment. For some reason, the main path didn't return to

operation and the backup path was on-air but sounded horrible. Distorted in a way only digital devices can distort due to an undoubtedly high bit-error rate in some area of the audio's path.

This problem was quickly fixed when I returned the main STL via remote control, and an investigation followed. What I found was that the output of our Barix Extreamer 500 was the source of the poor sound, but was it the

Extreamer which is the decoder at the transmitter site, or the Instreamer, the encoder at the studio end, that was coughing up the bad bits? Restarting and verifying the configuration of both ends yielded no improvement.

Having no backup was not an option, so I quickly trotted our spare Tieline Bridge-IT (thanks Amanda!) down to the transmitter end and fired up the Bridge-IT we use for remotes to send it audio. Backup path restored, but what was wrong with the Barix? It's much easier to troubleshoot something like this on the bench so I set it up and wouldn't you know, it works perfectly.

Intermittent problems are the worst. The fear is that if I put these two Barix units back into backup service, they'll fail again, but how will I know? It makes me think that backup units, no matter what they are intended to support, are only useful if they are tested regularly.

Play-Out System Backup

Backing up an audio play-out system (in our case, NexGen) is an important, possibly business-saving, routine that needs to be deliberately and sensibly carried out. Until recently, I've been using the built-in backup program provided by NexGen,



Installing the new HVAC unit at the WCHB site.

but I've been underwhelmed with its performance. It's excruciatingly slow, is not automatic, keeps no log or history, and it starts with a probably 45-minute-long period where it says "not responding" while it enumerates the file system. When the portable drive I was using to perform the backups failed, I decided that enough was enough; time to do something else.

Our NexGen file server runs Windows Server 2019 which comes with a basic backup software that can run scheduled backups, handle multiple sources and destinations, as well as create bare metal recovery and system state backups. The challenge with backing up NexGen's database is that it's a dynamic thing; ever changing with the content of the system. It's not something you can just grab

files from while the system is running and get something that could be restored in the future.

Because of this, NexGen copies its database to a backup folder during its overnight routines and keeps the last seven days using a FIFO scheme. Every day, I grab those seven folders using Robocopy and Windows Task Scheduler, move them to a spot on the server where the Windows Server Backup can grab them, then it backs up those along with all of the system's audio. The backup now takes about 4 hours and 45 minutes using an SSD USB3.2 external hard drive rather than the nearly two weeks it took before. Another tremendous advantage of this is that the backup target drive is invisible to the operating system, meaning nefarious file encryption routines (i.e. ransomware) cannot find it.

News from the South

by

Todd Dixon, CBRE
Chief Engineer, CBC-Alabama

Generators

It wasn't very long ago (July 2022 *Local Oscillator*) that Cris spent some time on the topic of generators and how they had become so much a part of our physical plants in broadcasting. We have three here in our Birmingham market, two diesel beasts at our WDJC-FM and WXJC-FM sites and one natural gas fed generator that we installed when we purchased our studio building in 2006. We have a guy named Perry McCravy that has been our go-to for maintenance and repair for about four years, and it helps that he listens to our WXJC-FM signal on a regular basis!

We were getting a low coolant warning on our generator at the studio, so I called Perry to consult about it before he made a trip. The coolant sensor is plugged into the top part of the tank (no-brainer) so that if it senses no coolant there, you at least have a chance to get the problem resolved before the radiator is empty and turns your engine into solid metal.

You can see from Figure 1 below that it initially just looked like a pin hole had bubbled through the radiator, but after we went to sand the surface and prepare it for a temporary patch – it was going to require a little more than a short-term patch.



The key to this temporary patch was JB Weld. They have a legitimate made-for-radiators epoxy that you can use, but since it is apparently their hottest seller, I had to settle for the "high temp" (500 degree) variety to make the repair.

Perry was down here as I wrote this, evaluating it and making a couple of calls to radiator shops and generator parts houses for pricing. As you might expect, it's not cheap and not in stock.

If the Kohler dealers get one made, it will be several weeks before we get it, but it will be a drop-in replacement with minimal down time.

If it has to be taken to a radiator shop, they'll need the radiator out of the generator so that they can

make a make a template for all of the necessary holes, get the right cores and tanks, and adding the aforementioned coolant sensor plug. Of course, you get back a radiator that is identical to the one you removed, but it will require being out of the generator for six weeks. I'm waiting to hear back from Perry regarding pricing and we'll make a decision from there.

Remote Voice Tracking

Like any good author and story, there is always an introduction to the characters and some problem to be overcome, sometimes a boring middle



Figure 1 - What started as a pinhole turned out to be much more. Todd made a temporary repair with JB Weld. A permanent repair is pending.

where the characters tend to lose their way and struggle to overcome the problem, and then the end where there is the inevitable conflict resolution.

While I didn't intend to be this way, the tease last month about remote voice tracking is now in the boring middle where the characters are struggling to overcome the problem. In this case, waiting for the appropriate cabling and cards from suppliers, odds and ends and software setup in order to do testing has been the boring middle part of the story. Next month, hopefully, we'll be able to share the exciting conclusion with all of you.

Firewall Fever

The end of November had us helping KCBC with a new ClearOS firewall install that will allow

them to get some internet redundancy with their new, additional ViaSat internet service. Cris sent two Dell servers here to get the same thing done for Buffalo. Since they're coming down to the finish line of their new studio build and move, the idea for these two servers is that one will be active and the other will have an identical setup and be ready immediately if the other server dies for some reason. So all of the ISP provisioning, port forwards and all of the extra software will be the same and be as simple as turning on the machine and moving the ethernet cabling to their correct ports from the previous machine.

We all need to be prepared for unlikely computer-even server grade computers that were built for longevity-parts failure and have a plan in place to get back online as quickly as possible. As soon as we get their initial internet provisioning setup, we'll get that knocked into both machines and then we'll have a way to configure the other internet service remotely and we'll send them on their way to Buffalo. I hope none of you thought we were going to take them up there ourselves—did you see that snow storm they got? I'm happy to stay in Alabama and let Fedex handle it.

Have a great Christmas and I pray all of you get opportunity to spend quality time with your family during the season.

Tales From Cousin IT

by

**Stephen Poole, CBRE, AMD
CBC Corporate IT Specialist**

"And just like that," Stephen said in his best Forrest Gump voice, "another year is ending." 2022 saw a lot of things happen in my life. I lost my mother in late March, then lost my wife on July 1st, just three days before our 28th wedding anniversary. I had moved to part-time engineering a few days before Sandy died; the company was gracious enough to bring me back full time afterwards, in my new role as the Corporate IT Specialist.

That sounds too high-fallutin', doesn't it? That's why I prefer Cousin IT. (Or "Cuzin EE-yut," if we're speaking Alabamianese.) The truth is, every successful radio engineer nowadays must have at least some Information Technology in their resume, or they'll be lost.



One thing that I've learned to dread is software updates. When you're talking about a big, complicated system like a web or email server, these can include hundreds of files. In the main, they work... but they're notorious for overwriting or changing the settings that you spent hours tweaking. Todd Dixon could speak to this: Windows updates, in particular, love to reset to defaults on the "power save" stuff. For years, I had to deal with Red Hat (and derivatives) changing the carefully crafted "host" and DNS spoofing that I needed for our mail and Web servers.

Whatever you want to call me, though, it has been a ride, I can assure you of that. And speaking of Windows updates ...

Abandon Hope, Ye Who Update

I had written about this last month, because the problem actually occurred in October. Microsoft released an update for Windows 10 and 11 that broke some programs. There was a great deal of confusion surrounding it at the time, so I asked Cris to just delete what I'd written until I had a better handle on things.

We're still not sure what happened. All we know is that the update caused all sorts of problems with secure/encrypted connections. The example for most of us was that Outlook stopped sending our email. You could receive mail just fine, but you couldn't send. If you tried, you received a cryptic error message (Figure 1).

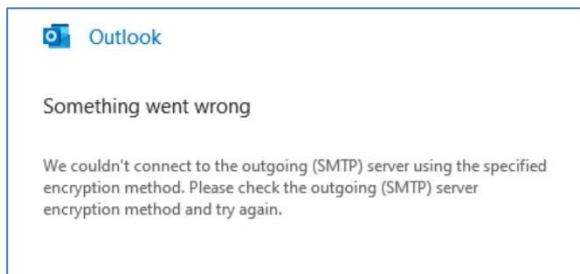


Figure 1 - Not good.

I worked closely with Cris Alexander and Mike Cary on this one. The quick fix was just to roll back the Windows update. Then I tried to address the problem, if I could. It was intensely frustrating that (at the time) I couldn't find good information on how to resolve this. Microsoft just recommended the roll back. There was very little info on what Outlook wanted ... from Microsoft or from anyone else; even the Zimbra forums were silent on the issue.

Transport Layer Security (that's "TLS" if you're into the lingo) has been upgraded over the years; the old Secure Socket Layer ("SSL") has long since been deprecated and has been replaced by TLS. Our mail server supported TLS 1.2, but one of my Web searches found a hint that Outlook wanted TLS 1.3. It took quite some time and a lot of (tense) editing of configuration files, but I managed to upgrade Zimbra to default to version 1.3 (Figure 2, a cropped screenshot of an SSLlabs.com check of our server).

Even after all my changes, the Outlook problem remained. To make a long story short and as best as I can determine, it appears that the problem had to do with the SSL/TLS "handshake," and it was indeed on Microsoft's end. It was fixed by an out-of-band update in mid-to-late October. Something about multiple packets being corrupted by gremlins with

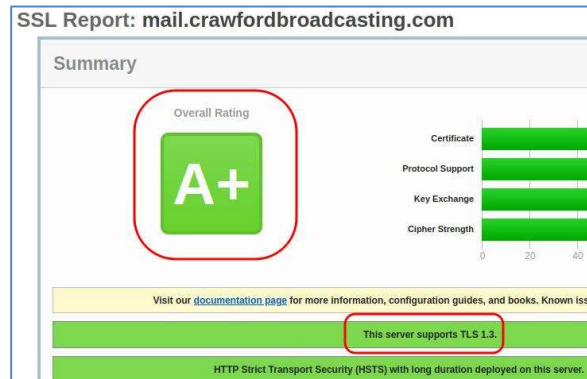


Figure 2 - Result of an SSLlabs.com test against our mail server.

NASCAR hats hiding in the RAM while eating soggy grilled cheese sandwiches... or something. Anyway. Glad to have that one behind us.

Smoking Power Connectors

This one doesn't directly affect us; we're not into GPUs that are powerful enough to calculate a Fibonacci series out to three million digits. But it demonstrates something that all of us have learned the hard way: you can't cheat physics and if you break Ohm's Law, you'll get thumped. You'll let the Magic Smoke out of whatever you've been working on.

Folks, hard-core gamers are a breed apart. I briefly considered buying a so-called "gaming PC" as a music and video workstation for my home studio. As it turns out, gaming and content creation put completely different loads on the hardware, so the expensive gaming PC would have been a waste of money. But serious gamers think nothing of sinking thousands of dollars into overclocked processors, water-cooling and Gangsta cases with all sorts of blinky lights. They also spend tons of money on huge monitors and dedicated, optimized graphics cards like the Nvidia GeForce RTX 4090. (There are registered trademarks all through this article, by the way). (The lawyers made me say that.)

For most of us, the integrated graphics that come with a typical PC will do fine. If you need a little more power, you can get a very good Graphics Processing Unit (a "GPU") board for at most a few hundred bucks. But a high-end gamer will drop \$1,200 on the latest AMD or NVIDIA card ... just to get a few more frames per second out of their system at 1440p resolution. The online reviews are hilarious: "We declare the GeForce card a winner over the AMD Radeon ..." but if you look at the figures and

do a little math, they're talking about an improvement of a few percent.

The other thing that astonished me when I looked into this was how much power these latest video cards want! The aforementioned RTX 4090 has a TDP ("Thermal Design Power") of 450 watts(!). You're not going to get that from the motherboard, so the newer cards have a separate cable to haul in the needed juice from the PC's power supply. Simply put, the video card draws more power than the CPU. I realize that a high-powered GPU is basically a separate computer – which is why they were popular for "mining" crypto-currencies – but still.

Back to those smoky connectors. They're called "12VHPWR" (Figure 3) and have 16 pins. To get enough juice to the card, NVIDIA includes a hydra-adapter that needs four 12VO ("12 volt only") feeds from the computer's power supply. All that current is then channeled into the RTX 4090 through this little 16-pin plastic plug. Do the math: 450 watts at 12V is 37.5 amperes. Some users apparently weren't pushing the connector firmly into the card, so

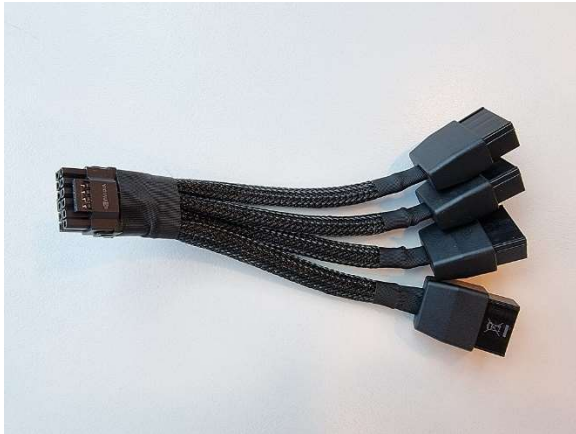


Figure 3 - The GTX 4090 needs FOUR 12V feeds from the power supply.

the current wasn't flowing through all available pins. The connector would get hot and melt, then catch on fire and surrender the Magic Smoke.

Our take-aways from this are obvious. First, don't break Ohm's Law. Second, Physics doesn't like being ignored. And third, make sure that all

connections are tight and right. But you already know that.

Upcoming

Simmering on various burners as I write this: first, a simple way to firewall and isolate our Sage ENDEC EAS units, while still permitting the necessary access to the Internet. Harold Price of Sage Systems did a nice Webinar on this for the SBE Denver chapter, which graciously allowed me to sit in. Harold did a great job explaining what we were looking at for the future, but we're waiting for the FCC to finalize some Rules for this. Right now, they're taking comments.

(Be still my beating heart. This is the same FCC that sends me a "DIRS" notice for a hurricane in South Carolina or a severe winter storm in Missouri. But we shall press on bravely, not knowing what the future may bring, but knowing Who holds the future! And stuff like that.)

Second, the first major rewrite of the online POR system should be uploaded sometime in the first week or two in December. I've said it before, but I'll repeat myself: the success of that system has astounded me. I'm humbled at all the "attaboys" I've gotten from our users. I've also been working on a system to get rid of paper expense reports; we want to move those online as well.

Third, I wrote a program right after we made our HD transition in the mid-2000s. It could take a single export from our NexGen system and relay it to several different locations. HD PSD hasn't changed much since 2006; it still uses the ID3 format via UDP. I'm writing a little gadget in Python for Amanda in Denver. She needs five exports for a station with separate day and night HD sites plus two FM signals and the stream, but NexGen only supports four. I've tested it here in Birmingham, and we're now installing it in Colorado.

As I have now exceeded my quota of acronyms (that's "QoA") for this month, I shall doff my ball cap and say, "Adieu and God bless." Ain't technology a beautiful thing? Until next time, keep praying for this nation! God's got this!

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

Aux HD Operations

Our recent efforts to get our backup HD transmitters operating correctly continue to be a bit of a challenge. In last month's column I outlined how, as we moved exporters and importers from our main transmitters, some of these devices began to fail as they were powered down, moved to different rack spaces and the powered up.

The newly appointed exporters required various repairs, and as we got them back to a functioning state, we then encountered our next issue, the Broadcast Electronics FXi60 exciters. After sitting for a while unpowered, they were also not working properly.

What we found was that they did work in the analog-only mode, proving there was nothing wrong with the transmitters. However, when we switched these to IBOC-only mode, we would get zero RF. Out of the four BE FXi exciters that we have, only one still worked in the IBOC mode, and it was not even able to take the transmitters to full TPO. The power levels would fluctuate quickly, and it would hardly be called stable.

So we are sending these units back to BE for repair. Once that is done, we believe the transmitters will be fine. This is because when we ran these

transmitters in analog mode, they made full power.

While this project has dragged out way longer than I expected, once finished we will have HD operations no matter if there is a problem with our main transmitters or main antennas.

Beta Testing

I was recently sent an Inovonics 541 modulation monitor for beta testing. I have had some opportunities for playing with, I mean testing, the unit. I hope to do more with it in December before I have to send it back. I have been fighting to get it to join the Wheatnet network. It has Dante AES67 as a feature so it can work on an AoIP network. I was able to get the Sophia Site monitor working on the Wheatnet network at my Kirkland transmitter site. The only issue there was that with the AES67 you could only use 48 kHz sample rate. I had already set up the network

previously at 44.1 kHz so while it connected to the network, it did sound a little weird.

The one thing that I really noticed on the 541 initially was that the internet stream that is created by the unit sounded great. This feature is greatly improved over prior models. I will hopefully have more on the testing next month.



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

I hope you all had a wonderful Thanksgiving. I cannot believe December is here and before we know it, 2023 will be here. It's crazy to think about.

Security Cameras

November was a good month in Denver. I was able to finally get cameras replaced at the KLVZ transmitter site. We have been buying cameras from Security Camera King which, for the most part have been good. The cameras don't last long here in Colorado, though. The sun and strong high-elevation UV wreak havoc on them, and they tend to get foggy. Despite my best efforts I could not correct the issue.

I have been replacing them at KLZ, KLTN and KLVZ. I was able to get KLZ and KLVZ done in October. We had to wait a bit to get KLVZ done.

One thing I have realized, when you see something time and again on a daily basis you don't notice the change. It wasn't until I had to replace the PTZ at the KLVZ site last year that I noticed the change. The new one is 4K, and it is a night and day difference. That's when I noticed all the other cameras beginning to look horrible. It's been great replacing them and having better video to look at when needed.

KLVZ-Night HD

It has been quite a few years since KLVZ-Night was in HD. When we upgraded to the new Nautel Exporter Plus and AM-IBOC Exciters, we had several NE-IBOC's left over. Mind you, most of them were failing, but we did have one that I got working on the 810 J1000. It was great until it, too, died. After trying to revive it for several weeks and even sending it to someone at Nautel (a friend) who wanted to try and work on it at home, we both agreed it was done for.

Since then, 810-night has been analog. Not a big deal, but as a company that loves and invests in HD, it was a bit painful to go from a beautiful HD

signal during the day to the analog only at night, especially with a great oldies music format.

One day at the site, I realized we had a spare Exporter Plus and AM-IBOC that we got from the Portland inventory when the station went dark. We also had an Omnia.9 audio processor.

I had mentioned to my dad that we do have the equipment now that we could use to get the nighttime to sound just as good as the day, so we did.

We got the Omnia.9 installed first. I had already loaded the preset we use for KLVZ-Day. When we put the Exporter Plus and AM-IBOC in, the Exporter Plus would not boot up. It hung up in the "initializing" process. It is crazy how we can use this equipment one day (Detroit used it recently while theirs was in for repair), and the next, it just doesn't work. We tried repairing it, replacing the electrolytic capacitors, to no avail. That got it past the "initializing" stage, but it had other errors. Nautel got it fixed, though, and sent it back. We got it installed and working. There were a few issues still, but none that were too critical.

We ended up doing a software update to the AM-IBOC and the Exgine. The instructions Nautel provided made the process very easy. Once we got the updates done and the unit back on line, all the issues we had were resolved.

KLTN Work

Many of you have read many times about the day/night switch issues at the 670 KLTN site. Back in October, the problem came to a head and ended up in several hours off air while we did some repairs.

My dad took on repairing the RF contactor in the phasor while I went to the ATUs, doing some minor repairs and cleaning. We had to schedule time to be able to take the station off air so we could make it safe for the work. My dad was able to remove the





The KLTT Tower 3 ATU after cleaning. Not perfect, but a sight better than the insect colony it was before! We found a vent hold plug missing, providing ready access to bugs.

switch, clean it up really well, lubricate and adjust it, getting it working properly.

I began working at tower 4 and replaced a J-plug assembly. Then I began cleaning, making the circuit of all the towers. These ATUs hadn't been thoroughly cleaned in a few years due to various reasons. It was good getting to spend some time at each tower getting the ATUs cleaned up. We got done right before dark and got the station back on. Tower lights were coming on as we wrapped up the work.

Upcoming

I still have plenty of work to do at the sites. At KLTT, I need to clean up both transmitters really well. Same at KLVZ and KLZ. ATUs at the other sites need cleaning. I need to convert the KLVZ building lights to LED. It'll be good to get the work done. I am hoping for some semi-warm days this December or January to do the outside work.



The Hopp home all decorated for the season!

On colder days or bad weather days, I will be spending time at the studios getting them cleaned up. Let's face it, people don't clean. The Wheatstone LXE surfaces were installed two years ago and probably have not had a good cleaning since. I think it will be good to get into each room and clean them really well and also clean the microphones and the equipment. I need to make the most of the winter months.

I am looking forward to Christmas this year. I don't know why really... I have been quite a grinch the last few years. This year I wanted to decorate. My wonderful husband did the outside decorating the weekend after Thanksgiving. I look forward to decorating the inside of the house, hopefully the first weekend of December.

I pray you all have a wonderful Christmas and that you stay safe and well. I'll see you next year!

The Local Oscillator
December 2022

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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