# The Local Oscillator

*The Newsletter of Crawford Broadcasting Company Corporate Engineering*

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**Naysayers**

It is always interesting to me to read the letters (more likely emails these days) that the trade publications receive in response to various covered topics. Usually, these letters mirror what I see on the broadcast-related groups on social media, but not always.

Seems like there is always a vocal group of naysayers about anything new. Quite often they are right in their predictions of failure of whatever new technology is being discussed, but many times it's not for the reasons they give.

Most readers of these pages are aware that we converted WYDE in Birmingham to all-digital (MA3 mode) back in September. There was a mostly polite discussion of this in one social media broadcast engineering group, and sprinkled in among the comments were some somewhat impolite remarks that I ignored.

Later, in one leading trade journal, unrelated to our conversion of WYDE to all-digital, I saw a letter to the editor that made a reference to AM HD Radio as a failed experiment.

For some reason, that struck me as sad. I think the writer did not understand the reasoning behind a good number of formerly HD AM stations turning off the digital carriers. As I understand it from discussions with those involved, this trend had a lot more to do with economics than anything technical.


**The AUI screen of WYDE operating in the all-digital mode.**

Most of the early adopters took advantage of licensing incentives offered by iBiquity, as we did. Many had to make significant investments in antenna system improvements to get them to pass the digital signals. Most ran their HD signals until their first-generation equipment failed. When that happened, they opted not to invest in replacement equipment, which was understandable given the economic challenges and the overall state of the industry in the late 2000s. Since then, things have certainly not improved overall for the AM medium, so there is not a lot of incentive to make big investments in facility upgrades.

All that is to say that AM HD Radio is hardly a failed experiment. Instead, it is an idea that arguably came 20 years too late. Had the technology been around when AM as an overall medium was still solid and profitable, we would be seeing a whole different picture in late 2023.

The same thing could be said about AM Stereo. Thanks mostly to the FCC's "marketplace decision" not to select a standard for AM stereophonic broadcasting, the technology came out too late, after music formats on the AM band had largely faded into the sunset. Had one standard or the other been selected ten years prior, and it doesn't matter which one, receiver manufacturers would have had a safe target and many radio stations would no doubt have adopted the technology. That could well

have changed the landscape considerably going forward.

Crawford remains a firm believer in AM HD Radio, but we're not blind to the realities, economic and otherwise. Our aim is to provide the very best listener experience on all our stations, AM or FM, and for our AM stations, that means clean, clear, loud analog audio and the very best digital audio we can produce, complete with PSD metadata.

We're counting to some degree on auto manufacturers to include HD-capable receivers in their vehicles. We find that a lot of people have HD-capable receivers but don't know it. They tune to our AM signals and get clear, crisp audio with full frequency response and stereo, and the song or program title and artist information is correctly displayed on their screens. To those listeners, it really can be all about content, with no compromise needed to hear programming available only on our AM.

On some of our stations where programming is duplicated, the AM signal provides superior coverage to the FM, so any compromise would be on the FM, not the AM.

Will AM HD Radio succeed? The naysayers say no, it hasn't and it won't, that it has already failed and we should pull the plug, too. We say we'll wait and see. We'll ride this train as far as it goes and see where it takes us. In the process, we'll provide those listeners with HD-capable receivers a really great listener experience.

The alternative is to accept analog AM, with all its limitations and competitive disadvantages, as the only choice, and that's no choice at all.

**Government Mandates**

There is one local TV engineer that comes to some of our local SBE chapter meetings, and he never fails to drop a derogatory comment about digital AM (or AM in general). Sometimes I'm tempted to unload both barrels on him, but so far I've managed to rein in that urge.

The reality is that had there not been two separate government mandates, over-the-air television may well not be what it is today.

First, there was "must-carry," a rule that requires local cable systems to carry local OTA TV signals. It's more complicated than that, but that is the gist of it.

Then there was the DTV mandate of the late 1990s that forced TV stations to invest a fortune in new transmitters, STLs, transmission chains and other equipment.

What if neither were in place? Cable systems would have no obligation to carry local stations and could charge for carriage. In a lot of towns for a lot of years, the majority of viewers were watching on cable. Then along came direct broadcast satellite TV (DirecTV and Dish Network). No "must carry" applied there, but between cable and satellite, over-the-air viewers dwindled.

I have heard industry people say that when the DTV mandate came down, it really didn't make economic sense to invest in the over-the-air system upgrade, and they likely would not have if must-carry had not been in place.

So turning that around, what might have happened if the FCC (or Congress) mandated a switch to all-digital AM 20 years ago? What would AM look like now? I would venture to say that there wouldn't be an AM/FM distinction on radios. There would just be stations. And they would all sound great.

So… with respect to our TV engineer friend who looks down on AM, there but for the mandates of the FCC and congress go you!

**Entropy**

The second law of thermodynamics says that entropy always increases with time. That is to say that a system, left on its own, will deteriorate. That certainly applies to our broadcast media, both AM and FM. That deterioration may come in the form of actual deterioration due to equipment aging, and it certainly will come in the form of a rising noise floor that deteriorates the signal-to-noise ratio of our AMs. But in our technological world in which Moore's Law is at work, the reality is that left on its own, any technology will simply be surpassed and become obsolete in time.

That is clearly what's happening and what has already happened to some degree with broadcast media, *AM and FM*. We're still pumping out kilowatts of analog signals in a digital world. We've applied band-aids here and there, things like RDS that provide metadata in the FM analog transmission domain, but the world has moved far past that, and we're struggling to catch up. HD Radio provides us with a vehicle to do just that.

In my view, those who choose not to adopt HD Radio are shortsighted and will eventually see their radio stations fade into irrelevance. It seems that the automakers, if they had their way, would like to move that process along.

Sadly, short-term is the name of the game these days. Many owners and investors look to the next year or two and focus on debt service and dividends. They are certainly not thinking about ten

years down the road. But we are. Our focus has always been long term, and it remains so.

With that mindset, we'll embrace new technologies where it makes sense to do so. We won't jump on pie-in-the-sky schemes that have no chance of success – DRM and reallocated spectrum are non-starters in the US – but where there is momentum, we will get aboard and work to keep things moving in a positive direction.

As for the naysayers… if their predictions become self-fulfilling, they will have only themselves to blame.

**Streams**

As we get into November, we're less than 60 days away from the move from Triton Digital to Soundstack as our streaming service provider.

To make it easier for all our individual markets to make the switch, we're doing it in Denver first, and in the process we'll learn all the tricks to make it work.

At this point, we have all eight streams up and running in Denver, but they're not public. We're encoding and ingesting to Soundstack, and we can listen to the streams on their individual stream URLs, but they're not public and won't be until January 1.

What's not working yet is the metadata (surprise!). That's always a challenge. I remember that it took a good while to get it working with Triton back in the day, and with Liquid Compass before that. I'm working with Soundstack, trying various things and sending screen shots to help them figure it out.

Thankfully, the Rocket Broadcaster encoder was fairly easy to set up, but we still have some things to work out. For example, if the machine hosting Rocket is rebooted or comes back on after a power outage, how do we get Rocket to automatically start with all the streams. In Denver we have eight streams, and all other markets will have at least two, so it's not a simple matter of putting Rocket in the Windows startup group. We need Rocket to run, but we need it to load all the individual stream files.

We'll get it figured out. Knowing that there would be a learning curve is why we started early. I'll keep you posted on our progress.

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

Hello to all from Western New York! I have often wondered if what we do as engineers really makes a difference, all the late-night emergency calls, missed family gatherings, canceled dinner plans, missed birthdays… you get the point. We put our calling well above those things that should matter most. We are adamant about making sure things are working properly, and when they don't, most of us dive into the problem or issue head first and don't come up for air until a resolution is found. Is all this worth the pain, aggravation, and worry?

Recently, one of the shows we aired on WDCX opened the phone lines to our listeners so they could tell what WDCX means to them. I was blown away by the response! You just have no idea who is tuned in at any given time, and from where.

There were people who were introduced to Christ while listening to our stations, mothers who were contemplating abortion but changed their minds after listening to broadcasts about others who have gone through the same situation, lonely people who were contemplating suicide because they thought no one cared, and the list goes on. Without WDCX, their lives could have taken a completely different path, including those around them.

We as engineers are not responsible for the content heard on our stations – that is left up to the programmers – but we *are* responsible for how the station sounds, the equipment that airs the programs, computers, consoles, STLs, transmitters etc. We make sure that when someone turns on the radio to

99.5 or 970, they can hear our broadcasts, with audio clarity, as best as it can be.

If this happens, yes, we have played a part in saving an unborn child from abortion, a depressed mother from neglecting her kids, a disgruntled husband from beating his wife, and the lonely person who felt unloved and alone who was contemplating suicide. Because we did our job, and cared, the lives of perhaps hundreds of people were changed!

Because of the testimonials I heard from listeners that day, I have come to realize that everything I do for our stations can have an enormous and eternal impact on someone else. This is the calling that the Lord has for us, and YES! What we do is worth it all!

As the year quickly draws to an end, we still have several projects to wrap up here in Buffalo. Our new WDCX-FM generator has arrived, albeit several weeks late, but the transfer switch is still a month out.

R.B. U'Ren, our generator supplier and maintenance company, will be removing the old 50 kW generator and replacing it with the new 100 kW one, getting everything ready for when the transfer switch does show up.

Additionally, Tri-R Mechanical is making plans for installing our new Bard 6-ton A/C unit that has been on back-order for almost a year! As we are into the winter months, it is not imperative that the A/C unit gets installed immediately, as we will have an abundant supply of nature-supplied cold air soon!

Hopefully, by next month, the new Gillette generator will be in place and ready to supply power to our transmitter plant if (and more likely WHEN) the winter winds and snow take down our commercial power grid.

The last week in October has been clean-out week at the WDCZ transmitter site in Hamburg, NY. I ordered a 20 cubic yard dumpster so I could clean out all of the trash that has accumulated over the years and a lot of items that the previous owner left for us to deal with. After several days, I was able to fill the dumpster front to back and top to bottom with all unwanted items! We still have a lot of old electronics to get rid of, which are illegal to dump into landfills in New York State, so we will have to hire an electronics recycler to haul all of the unwanted LED screens, desktop computers and old analog studio equipment from our recent move from downtown Buffalo.

You may recall the issue we had with our 23 GHz Cambium Part 101 link from our new studios in Amherst to the SUNY tower, which is approximately ¼ mile to the east of our new leasehold. After Transwave Communications installed the link and aligned the path, we expected to see -31dBm of signal strength, but instead we saw a level of -60dBm.

Thinking it was a polarization issue, I went up on the roof and changed the polarization from vertical to horizontal… and saw no change in signal level! How could this be? We should have seen at least a 20 dB reduction or increase in signal level by changing the polarization! Although the signal level is down considerably from what we should normally expect, the audio path has been consistent and we have not experienced any drops in audio.

However, we need to address this situation before the long winter season approaches. Who knows how this path will perform once the winter winds start to blow and the snow starts to pile up, as it typically does in Buffalo.

On Friday the 27th, Jason Zeczak (our new contract engineer) and I performed a sweep of the rooftop antenna to see if perhaps we were aligned to a side-lobe of the signal path. Jason performed an azimuth and zenith sweep of the dish in all directions on the roof while watching the RSSI level from the Cambium radio, and I was stationed downstairs in my office viewing the radios' operating parameters via the web interface. I had changed the web interface to re-scan the parameters at a 5-second interval to ensure that Jason and I were seeing the same results as he made changes.

The best level we could obtain was -57dBm, so Jason locked down the adjustment at that level. There is something attenuating the signal level, we just haven't been able to pinpoint the cause. Talking this over with Cris, we have gathered a game plan to resolve or at least diagnose this issue. More to come 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*, be well and have a blessed Thanksgiving, and happy engineering!

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

It seems that the older I get, the more times I find I'm my own biggest obstacle. Fortunately, I use these experiences as learning opportunities because, why not? It's always little things like forgetting my glasses, or leaving my lunch at home, but occasionally it's something really annoying like doing a job then finding I did it wrong and having to do it over. When that happens, I say: "I like my job so much I do it twice!"

**Tachy Tech Twice**

If you recall in last month's computer fan tip, I wrote that I "solved" an errant fan speed issue by replacing the fan. Except I didn't. Shortly after that issue of *The Local Oscillator* was published, the fan speed alarms started showing up again. Same module, same fan. R&R the module again, find nothing, then it works again – for a while. Hmm... is the fan really stopping like the log says? It's so deep inside the transmitter that there's no way to inspect it while it's running; I have to decide whether to trust or doubt the tach signal.

Taking the suitcase sized modules that are bolted in from the rear out of the transmitter is not hard, but requires a lot of undoing – lots of aluminum M4 screws and of course the big bolt.

Most NV users take the bolts out and never reinstall them, but this transmitter was tweaked somewhere during its move from Nova Scotia to Las Vegas where it was displayed at NAB, moved back to Nova Scotia, and then sold and ultimately moved here to Detroit. This tweak or twist has created a problem where the power amplifier modules have very little engagement into their mating connectors in the mainframe. Keeping the rear bolts in place draws the modules further into the connectors and has minimized the connection issues there.

Knowing this means it's important to prove there isn't still an edge connector issue or even a fault elsewhere in the transmitter. I swapped this module to a different location in the frame. The problem moved with the module, meaning it exists within the module itself.

I like to use Occam's Razor whenever I start troubleshooting something. Wikipedia states that "in philosophy, Occam's Razor is the problem-solving principle that recommends searching for explanations constructed with the smallest possible set of elements." Plainly stated, the simplest explanation is likely to be the correct one. Therefore, I replaced the fan. While Occam's advice has served me well in the past, it isn't absolute – complex and unlikely problems, well, they can occur too.

Why I was wrong? I was wrong for not checking the intramodular wiring, assuming that it being plugged in was good enough.

The path from the fan pc board to the module's edge pc board is completed using a flat cable with RJ45 connectors on each end. I've long been used to these (especially factory made) cables being beyond question, having the mindset that they never go bad unless they're damaged.

As the days march on and these cables age, they can fail, and that's exactly what I found inside this module – a factory-made CAT5 cable with no visible damage that's worked for 14+ years became intermittent and ultimately failed on pairs 7 and 8. Replacing the cable fixed the issue. Had I busted out the multimeter in the beginning, I may have saved myself a bunch of time. Live and learn.

**Did You Know?**

A Nautel AM HD exciter can be programmed to automatically switch to an AM (analog) only preset should the HD data stream from the exporter fail. It can switch back, too. The D-connector on the rear panel can be connected to your site remote control system to indicate the HD Data Missing fault.

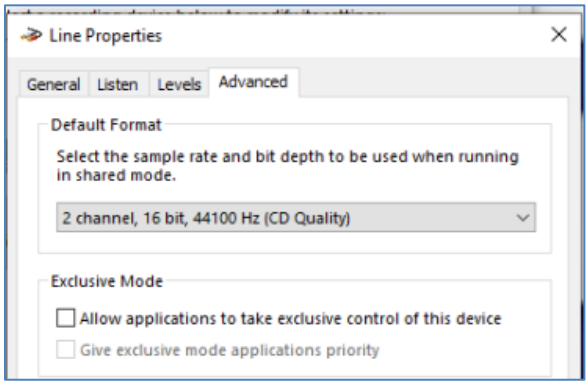
Computers running Windows 10, 11, and Windows server OS have a built-in backup program that can be accessed through the classic control panel (yes it still exists). Press Windows key, type control, look for "Backup and Restore (Windows 7)." I use it to back up our NexGen system and my laptop.

A USB type B plug can be plugged into an RJ11 Jack. When you do this, the printer won't work, and you will scratch your head for an hour, and while

you're doing that, somebody will print to it over the network which will really blow your mind!

**Windows Downdates**

The title of this section is not a typo. Since changing our house sample rate from 44.1 kHz to 48 kHz, I've noted on several occasions the properties of the sound device changing down their sample rates on their own. Our systems need to be set to two channel, 16 bit, 48,000 (DVD Quality), and Windows is reverting the settings as shown:




I've reached out to our friend Trey Bryant, one of Wheatstone's Technical Support Engineers who provided the following insight:

Unfortunately, this is something that happens with Window's Updates. I see it a lot with AOIP drivers changing to 48 kHz, and people will call and say their playback sounds really slow and creepy. For whatever reason, Windows does the opposite with USB drivers. They seem to "default" to 44.1 kHz. There is nothing that can be done in Wheatstone's Wheatnet system to tell extraneous devices what sample rate to use, and only one rate can be selected for an entire WNIP (Wheatnet) system.

The only thing you can really do is to regulate your update schedule on your PCs that use USB drivers so that you can control when they do update(s) or turn off updates. I will also point out that not every update will do this to audio driver inputs, so sometimes you may not have to do anything at all.

**Close the Windows**

We all rely on Windows to do just about everything, and it's certainly a powerful operating system. That said, Microsoft has a propensity to grasp control of certain aspects of the computers that run their OS, and I'd opine that they've done so to a fault.

As new PCs roll in the door, I've noticed that Microsoft is committed to their resolve to have every node connected to their servers by logging into a Microsoft.com account during setup. It's certainly helpful that Nanna's PC stays updated and security patches are kept current, but not in a business environment we have mission critical PC's that can't be changed or interrupted without consequence to the operation. Again, great for the average user who wants to sync their passwords and browser favorites but not even a possibility for us when setting up a studio machine.

We don't have MS accounts for machines like this, but short of setting up a domain controller, there's no way to bypass this. Or is there?

Recently I found a hack that lets you set up new hardware without this hassle. Check How to Install Windows 11 Without a Microsoft Account | Tom's Hardware (tomshardware.com). Not sure if it's related to this set up tactic or not, but there's definitely less bloatware installed on the computers I've used this on, too.

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

**Recurring Themes and Their Resolutions**

Some may recall that in the Birmingham market, we made a switch to our WYDE-AM signal to take it all digital (MA3 mode) on September 1, 2023. I documented the challenge I had with a Kenwood HD receiver that would not lock to the all-digital MA3 signal.

Jack Bonds and I were able to insert a Boston Acoustics tabletop HD radio into our Wheatnet system as a monitor source for the signal at the studio, and Jack's Mini Cooper has an HD radio that has no problem getting WYDE's new signal.

So, referring to an excerpt from my article in these pages in August, "I'll be trying to find one of the 99,950,000 receivers that can pick up the all-digital broadcast…"

I went to Crutchfield again and found a single-DIN JVC HD model that I thought would suit my needs and ordered it. I don't want to spoil it for anyone, but you might know that Kenwood and JVC are the same company now. Since the JVC model was comparably priced to my previously purchased Kenwood, I'll let your deductive reasoning skills drive your suspicion about what happened next. You're the Grand Prize winner if you guessed that I still couldn't tune in WYDE-AM and that I got similar results to my Kenwood deck that I had purchased a year earlier.

I always try to inject something into these articles so that people might know something about me. This month's nugget is that Todd doesn't gamble – and the reason is certainly drawn from life experience.

Cris had put me onto Jeff Detweiler at Xperi with my initial experience in August, so I reached out to him to guide me in my replacement of the JVC model that I was sending back. When Jeff heard that I had purchased a second model that could not tune our all-digital signal, he got in touch with their marketing guys and they had unit sitting on their shelves that their test labs had determined to be completely compatible with HD radio, including the MA3 AM mode, and he sent it to me as a gift.

Because of this experience, I had become a consummate pro at removing/installing my car stereo. When I received the unit, I had it installed within about 30 minutes, powered it up, and there it was – beautiful all-digital WYDE-AM in all its glory.

The paperwork in the box indicated that it was around a 2014 vintage, but at the end of the day, they had run it through its testing and put it back in the box, so it was practically brand new.

I guess as a side note, if I had tried to get a double DIN Apple CarPlay or Android Auto model with touch screen and backup camera support, it likely would have worked from the start, but I am grateful to Jeff Detweiler and Xperi for their generosity. It is providing exactly what I needed, and I'll call this resolved.


**Installed and finally tuned to an All-Digital 1260 WYDE-AM in my Jeep Wrangler!**

**AC at Our Studio Building**

In September, our studio building management company, Brentwood Properties, informed us that one of the compressors had gone out on our 30-ton Trane RTU that feeds the first floor of our building. Our studio operations all happen on the second floor of the building, and the 35-ton unit that services the upper level had been replaced about three years ago for about $45,000.00.

These bigger units have two compressors, and it was the secondary one that had failed, so if there was such a thing as a perfect time for it to happen, this was it as we're headed into the fall and winter months.

I had gotten a quote earlier in the spring for

a replacement as the unit was nearly 25 years old and due for replacement anyway. It was costing more and more to replace parts and refrigerant to keep it running. The R22 refrigerant, which is equivalent of liquid gold, was becoming increasingly difficult to source and replace when problems did happen.

The three-year difference in the price tag at $75,000.00 was a gut punch, but it's been ordered and we expect to see it in February or March of 2024.

As you might imagine, as AC package units get bigger, there are fewer and fewer companies that consider it financially viable to even make them. Of the three quotes I received, two were Trane units and one was a York unit. All of the quoted units were at least 26 to 40 weeks out on their dock delivery dates. These companies and the contractors that install them are put in a pretty tough spot. They're producing each one as they're ordered, as they simply can't afford to have environmental regulations change in the middle of a production run that would make their products unable to be sold or installed. Even as I write this, the R410a refrigerant used in the units we currently have and are purchasing will not be allowed in units built in 2025 by regulation, as it is to be replaced by the newer R454b. At any rate, this is one area where we should all likely expect continued price increase and change to Freon variants in the future.

Blessings to all of you in this time of year as we focus on gratefulness and we'll visit again next month.

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

My most recent experience with Atlanta, GA came this past month. I was headed to Columbia, SC, and then to Fayetteville, NC, to visit with family. As it turned out, it was a busted trip: I was having muscle spasms (it's been too long since I've driven for several hours); my sisters were both sick; and my mother-in-law in NC was in the hospital.

I don't like Atlanta. Because it's a 3-hour drive from my home in Alabama, I inevitably find myself going through at rush hour – morning, lunch, evening, doesn't matter. I'm going to be stuck in traffic. This trip was no different (Figure 1). I finally made it through to Tomson, GA and spent the night in a hotel.

The next day, I made it almost to Augusta before I decided to turn around. This meant that I got to drive through Atlanta twice in two days. It just so happened that my return trip through Atlanta wasn't impossibly bad; I hit the metro around 3 PM, before the traffic became really impossible. The picture here was taken while I was stalled in traffic on the first day.

My late wife was seeing a specialist at Emory University for a while. Once again, the timing seemed to always push me trying to leave Atlanta during one of the heavy traffic periods. I once made the mistake of thinking I could get off the wreck-and-construction-blocked interstate and just drive through the city. Oh, yeah, that went swimmingly. On that particular occasion, I left the doctor's clinic at about 2 PM. We didn't get clear of Atlanta (which I define as, "when you finally get past the I-285 intersection on I-20") until after 5 PM. 25 miles in three hours. Do the math.

It's also a given that you will pass at least two or three accidents on your way through. I thought people in Alabama were crazy drivers (and before I moved here, I was convinced that the soldiers in Fayetteville/Ft. Bragg, NC would take the prize on Friday nights). In Atlanta, you will see people attempting things that are physically impossible – like trying to pass in the narrow space between two big trucks, or scooting around someone on the shoulder. The HOV lanes are filled with people driving way too fast ... alone. There aren't enough cops to write tickets for everyone who's doing the solo HOV flight.

But I'm here, God is still blessing and life is good. On to other things.

**Cousin IT Branches Out**

There are so many things that one must know to work in Information Technology. Most of us (rightly) only focus on those things that are required in our jobs. I've found my brain expanded lately as I

learn about Amazon Web Services ("AWS"), GitHub and a bunch of other things. Because I use open-source software myself, I was familiar with GitHub, but learning how AWS integrates with GitHub repositories is new to me. It's interesting and Lord willing, I'll have more to say on that in the future.

My other responsibilities continue, of course. This company has several important servers that must be updated and backed up on a regular basis. My weekends, which most people would spend


**Figure 1 - Atlanta: yuck.**

fishing or playing golf or shopping, are usually filled with me remoting into these servers to check on things. But I have to say that this is better than the all-nighters I used to pull when I was a certified Knob Twirler™. Nowadays, instead of tweaking transmitters, I'm more likely to be SSH'd into a server. At least it's while the sun is shining!

**The Unauthorized Server**

There's a good reason why Cris requires that we use ESET end point protection, isolate network access from guests, and take other important steps to keep our critical systems safe. Years ago, when we used to just have One Big Network that anyone could access, we would sometimes find an unauthorized server with internet access. This would typically be a web or streaming server that a client would set up while his/her show was on the air. Aside from the hit on our bandwidth – at the time, we'd cry happy tears if we could get 1 megabit upload – it would be an understatement to say that they weren't exactly secure.

Believe it or not, it hasn't been too many years ago that you could put a web or email server online with very little effort. Todd and I did it in Birmingham with the old Mandrake Linux distribution. We installed it, went into their config tool and said, "Give us a web server!" ... and there we were. Registering a domain name was easy as well. For a few bucks, we told a registrar that we wanted "BhmStuff.com" (or whatever), and within an hour or two, anyone in the world could browse to our little web server.

Needless to say, things have become much stricter nowadays. Any legitimate registrar requires that you prove ownership of a domain name before you can register it. Most browsers now will raise a warning if you go to a site that doesn't support HTTPS, or that is misconfigured, or that uses a self-signed certificate. Obtaining a cert for TLS/SSL isn't a simple matter of paying a fee anymore, too. These are all good things, but it does make things more difficult and exacting for those of us who legitimately need these services.

**Have a New Processor!**

I had to joke with Todd and Jack about AMD (re)introducing their "Threadripper" series for consumer desktop computers. They're fast, no doubt about it; the geeks online are salivating at how it slaughters even the fastest and latest Intel chips ... but they ain't cheap. The processor itself ranges from about $1,500 to $2,500 (just for the chip!), and then you have to buy a motherboard and high-speed RAM and all the other goodies that would let you actually use that capacity. But you can have up to 96 cores!

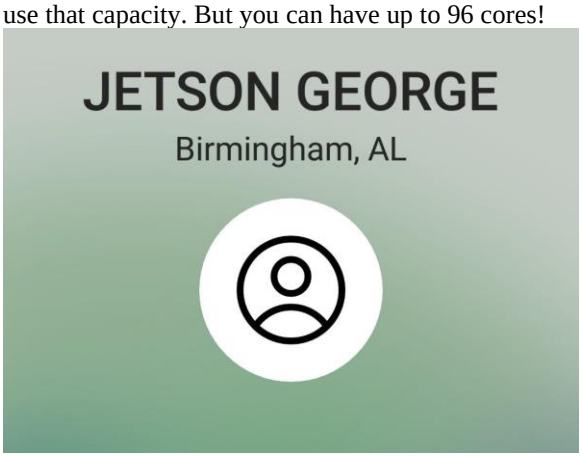


**Figure 2 - Being a highly-skilled IT pro, I assumed this was spam.**

They also draw a ton of power (several hundred watts), which means that you'd need a new power supply and lots of cooling. I strongly suspect that only those who simply must have the latest and greatest will shell out the cash for these systems, but hey, I've been wrong before.

But I must admit that the temptation was there. If I could find a multi-processor system with three or four Threadrippers (or set up a cluster), I

could create my own Artificial Intelligence. But then I figured it would probably just tell me that I was moron and ugly besides, so I gave up on that one.

I don't think we'll be purchasing any of them – we can get much better deals and meet our needs just fine with HP or Dell.

**And Finally ...**

We're still a year out from the election, but the spam has started. Text messages, emails, you name it: "Help us defeat the Evil Republicrats! Send money!" The usual scams continue, too; I have my phone set to permanent Do Not Disturb with exceptions for people in my contacts. Most of the time, the auto-call will simply hang up if I don't answer. But now and then, the robot will leave a voice message, typically for an auto warranty or a credit card. The best one I've received lately is shown in Figure 2: I guess Judy wanted George to make some side money.

Until next time, keep praying for this nation!

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

At the time of this writing, quite literally, the new generator at our Burnham, Illinois transmitter site should become operational. The week before, the various crews came to the site to install the new generator.

We had kept the prior generator operational until the very day the crews came out for the swap. On that day, I actually counted 10 trucks at one time at the site, which included my truck and the crane that actually lifted the old generator out of the way and then placed the generator on the concrete pad.

One of the crews that did not show that day was the concrete contractors. They had actually performed most of their work back in June when they had removed a portion of the existing concrete pad to allow new conduit to be run in a different spot of the pad. This was due to the footprint of the new generator being different than the older unit.

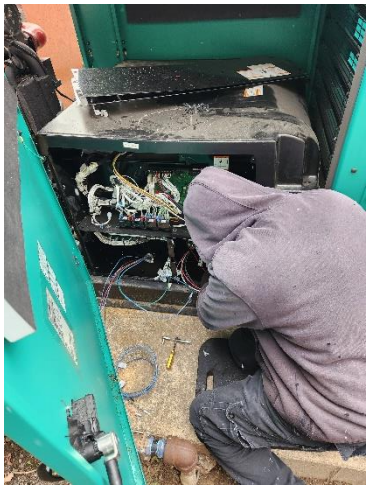
Another issue that had to be addressed was the difference in fuel systems between the two units. The existing unit had used propane but in liquid form. When we were about to install the generator in July, it was discovered that the new generator had arrived with a fuel port that needs propane in vapor form.

On the surface, this may not have seemed a huge difference. Both systems used propane and there was a propane tank with a supply pipe to the generator. However, this meant we needed to be sure the propane tank could be tapped for vapor instead of liquid. Just getting this information was way more difficult than it should have been. Due to the support layers of our propane supplier, I was not able to talk to any technical person that had knowledge of our tank. I finally had to park on the local suppliers parking lot and wait for a human being walk out of the door to get to someone locally.

It also meant that the regulators on either side of the supply pipe had to be different than what was ordered. This meant further delays. Once we had everything in place, the electrical crew was involved in work for some other customers, and this caused us to have to go to the back of the line.

So, with multiple crews there, the work went quickly, and the generator install was essentially finished in two days with the exception of the generator company Cummins bringing a tech out to perform the official startup. As mentioned, already the startup work is happening even as I write this. See the next page for some pics.

We'll get you an update next time!



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

**The End of Mowing**

Can I say that I'm glad I'm done mowing for the season? Because I am. I should've gotten KLTT done, but the growth is too high and it's too dry.

Mowing at KLZ was time consuming, two weeks and four days, and that included many stops to blow the debris off the radiator to prevent it from overheating. If I mowed at KLTT I would have to find a way to bring the air compressor out into the field with me to keep from having to go back to the building every few minutes to blow the chaff out of the radiator.

My hope is that winter will help with KLTT, and next year I can start over fresh. I still need to spray the Kubota tractor off and do some year-end maintenance. But all in all, it was a good mowing season that I'm glad to say goodbye to.

**Fall Cleaning**

Aren't we supposed to clean in the spring? Well, fall will have to do. I spent a half day at KLTT cleaning inside the building and mowing some around the building and tower bases with the riding mower.

At this point, I am very happy with the looks of KLTT. It had moths, spiders, and other bugs all over the place. I did find some dead moths that need to be cleaned out on a recent look inside the combiner cabinet of the aux transmitter. I also still have some more cleaning to do at the ATUs and inside the phasor, but for the most part, things are in really good shape.

It's good to see things coming together at the sites. Getting them back in good condition. My next stop will be KLZ. I have an upcoming 8 AM-5 PM window to wait for Century Link to show up and fix the internet service there, so what better way to spend my time than cleaning up inside the site?

My hope is to get the storage shelves cleaned up and organized. I need to move some stuff to the crawl space, and more importantly, I need to spray for bugs. We have a serious wolf spider problem. I don't like spiders, much less big ones that jump at you. It's not fun at all.

**Phones, Internet, Lumen Oh My!**

Speaking of having to wait for Century Link/Lumen to show up for repairs, they are on a list of mine and it's not a good one. On Monday the 23rd, when I was at KLTT working, my dad called me and informed me the office phones were down. He had already done some troubleshooting, so I went ahead and called Lumen.

They could see an issue, and the wait for repairs began. I'd get periodic email updates basically saying they are waiting for a tech to be assigned. Then the email would go something like the tech could not find/repair the issue so it will go to the next shift, then waiting for a tech to be assigned, and around and around we went. Three full business days of no phones!

They wouldn't tell us much, but from what we gathered from some friends who are in other areas of the business, we learned two things. First is that the techs are jumping ship. They don't want to stay on a sinking ship, so they just don't have the manpower to do the work. The second thing we learned, Denver is a main hub and yet they don't keep spare parts here. Part of the delay for everything was having to wait for a circuit board to be shipped in to see if it would fix the issue.

Needless to say, we are actively looking into our options to get away from Lumen.

Then, I received an alert from my temperature sensor at the KLZ site telling me it hadn't received a signal since 11:10 AM on 10/26. I began investigating and made my way to the site. Sure enough, the lights on the modem are red. I did the usual reboot to no avail, so I called tech support. Even though we have business class internet, we still must wait on repairs. I have plans to go out shortly after I write this to wait. I'm praying this isn't an all-

day event, but as noted, they gave me an 8:00-5:00 window. Ridiculous!

**HELP!**

I finally have found someone to help me out with the work at the sites. The last guy didn't work out, which may be a blessing in disguise. This other guy I also found through our local SBE group. His name is Dylan Berichon, and he is an AM radio guy, having worked in the Portland market for several years. He works full time for another broadcaster here in the Denver market and will help me out when needed. It'll be nice not having to train him. He seems to really know his stuff, and the best part is he is excited about AM radio. We know so many people who don't like it and just talk down about it. It's refreshing to see someone who loves AM radio and who wants to see it thrive.

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

**KBRT • Costa Mesa - Los Angeles, CA**
***740 kHz/100.7 MHz, 50 kW-D/0.2 kW-N, DA-1***
**KNSN • San Diego, CA**
***1240 kHz/103.3 MHz, 550W-U***
**KCBC • Manteca - San Francisco, CA**
***770 kHz/94.7 MHz, 50 kW-D/4.3 kW-N, DA-2***
**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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