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HD Power

No doubt many of you have read in the trade press that the FCC recently enacted a rule change that will permit asymmetrical digital sidebands on FM HD signals on all but the highest FM frequencies. The idea is to give stations the opportunity to increase HD power while preventing interference to first-adjacent channel stations, If, for example, an FM HD station has a spectrum neighbor on the firstadjacent channel below but the spectrum on the channel above is clear, that FM HD station would be allowed to increase power in its upper digital sideband carrier group while keeping the lower digital sideband carrier group at -14 or -20 dBc. The added power in the upper digital carriers would be of benefit to the FM HD station, improving its digital coverage and robustness.

That is a good solution in my view and represents a good and efficient use of spectrum. It will permit stations that are otherwise constrained to a lower digital power level by an adjacent-channel station to maximize its digital footprint with higher power. The lower power sideband will still provide redundancy and add to the robustness of the digital signal, but the higher power sideband will produce better building penetration and performance in weaker signal areas.

I have studied all our FM HD stations to see what the possibilities might be for higher digital power. There are definitely some options for us, and we will pursue some of those. But what I found is that it's not always spectrum neighbors that are the limiting factor for HD power levels.

All our FM transmitters are relatively late model Nautel products. All are low-level combined (common amplification) HD schemes, which is convenient and uncomplicated with respect to RF plumbing and antennas. Each of these transmitters exhibits a certain power slope – as HD power is increased, the lower the maximum analog power level. Like all things in life, there is a tradeoff between digital power and analog performance, two different curves going in opposite directions.

Another factor that comes into play here is overall efficiency. For example, with many of our transmitters, at -20 dBc HD power, the overall efficiency (AC to RF) is reported at 70%. Increase digital power to -14 dBc and that overall efficiency drops to 60%. Crank it up to -10 dBc and the efficiency drops to 50%. That means that the amount of power wasted as heat increases significantly as the HD power is increased. That increased heat load must be overcome by increased cooling.

What I found, looking at our FM HD stations, is that with few exceptions, it's not worthwhile to crank up the digital power. The added utility power costs of making the RF plus the added utility power costs of getting rid of the heat is significant. And then there is the cost of the utility power for making the added digital power. All three of those things can add up in a hurry to make a digital power increase very expensive, a gift that keeps on giving.

Some facilities simply don't have enough cooling capacity to handle a digital power increase, so there would in addition to the ongoing utility costs be the capital cost of upgraded HVAC. And in almost every case, the late model transmitter cannot produce the maximum permitted digital power level while maintaining the required analog power level. There is no way to address that short of going to separate analog/digital RF chains using separate antennas and transmitters. It is simply and clearly not worth the expense for a few dB of additional digital power.

All that said, some of our FM HD stations do have room to increase digital power, all symmetrically, they do have adequate cooling

capacity, and the added digital power would undoubtedly be of great benefit. For those stations we will pursue digital power increases as soon as the online forms have been approved and made available. More on that in a future column. For now, we have increased WXJC-FM to a symmetrical -14 dBc (from -20 dBc), a fourfold increase which is permissible under the current rules. The notification was filed with the FCC and Todd Dixon made the change a few days later. At present we are evaluating both the digital coverage improvement and the ability of our air handler to take care of the added heat load, and of course we will be watching the utility bills closely in the coming months.

HD Graphics

Last spring, we ordered the TRE Plus Advertiser middleware package for WDCX-FM in Buffalo. The idea was to give our people there some additional broadcast-related inventory to sell.

In the Denver market, I continually see advertiser-related messaging on both HD PSD and FM RDS displays of the classic rock stations to which I often listen. Those stations aren't giving that messaging away; it has value. If I'm ever in an auto accident, I know to call the Wilhite Law Firm because "wilhitewins.com" is displayed on my radio!

It goes further than that, though. With so much dashboard competition these days, radio stations that don't have an attractive dashboard appearance inevitably take an "also ran" position in the lineup. Satellite radio, Pandora, Spotify and other streaming services feature album art and other eye candy. Over-the-air radio... for many stations, not so much.

That's certainly something that needs to change, and we've been working on that, participating in Autostage DTS for one thing. But we still need more.

In Chicago, we've been transmitting HD graphics for a long time now, and for years we used the no-longer-supported Arctic Palm middleware package for that purpose. We made the jump to TRE Plus earlier this year, and it was a fairly easy transition.

In Buffalo, what I thought would be a similarly easy transition turned out to be anything but. We got the RDS and PSD text messaging working without issue, but when it came to graphics, we found some issues with our infrastructure, primarily a really old importer that had somehow escaped my notice. How it, which is essentially a Windows PC, kept working for so many years is a mystery to me. But it definitely needed to be replaced, and we ordered a replacement last summer.

It took months and months for the new importer to ship – apparently the holdup was the sound card – but we finally got it last month and Brian Cunningham got it installed without too much trouble. I'll let him share his importer experience with you in his column below.

The bottom line here is that we now have some bling-bling on our HD display in Buffalo. We will continue to refine that going forward, using it to display album art, station and program logos and hopefully advertiser graphics.

Movin' Out

We didn't exactly move our Denver operation out of our high-rise leasehold, but it sure felt like it. We recently signed a new lease for the space we've been in since 2010, and included in that new lease was new paint and carpet throughout. That all sounded and looked really good on paper... right up until the time came to actually have the work done.

The landlord and his paint, carpet and moving contractors worked with us to develop a three-phase project plan that would, for the most part, allow us to continue to occupy the space while work was going on. The actual paint, carpet and moving work was done on the weekends, starting on Friday afternoons and wrapping up by Sunday nights. For our part, we had to box up everything and have it ready for the movers on Friday afternoons, first in the common and cubicle area, then in the private office area the following weekend, and then in the studios the first weekend in November.

Needless to say, this has left us a bit... unsettled... for the past couple of weeks, but the finish line is in sight. And our leasehold is looking fresh and new again, with that new office smell (that's probably actually toxic fumes from the carpet glue and paint!).

This project has been a good reminder for me of why I hate moving.

Stream Monitor

Last month, we installed an Inovonics 611 stream monitor in our Denver TOC. Amanda set it up to continually scan all our company internet streams and produce alarms for low/no audio, missing metadata and other error conditions. Now we don't have to rely on listener reports of issues before we fix stream issues. We'll let you know in a hurry if we find a problem with your stream.

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

Hello to all from Western New York! For months now I have been trying to chase down an anomaly in our WDCX-FM analog signal.

The problem is, you can't hear it on all receivers! Our GM, Brett Larson, brought this to my attention several months ago, when he noticed some crackling and whooshing in various programs. It doesn't happen all the time, and the noise varies from program to program. Some have it, some don't.

I listened in the production room to several programs on which he

reported this problem, and everything sounds clean there, so we have ruled out a NexGen problem. Listening on the headphone output of the Tieline Gateways to the signal being sent to the Cambium 23 GHz and 6 GHz microwave links, it's clean as a whistle.



The screen on the factory radio in my Jeep.

Last month, after a reboot of the Tieline Bridge-IT XTRA codec at the transmitter site, he said the noise went away (for a while) but came back after a couple of weeks. I called technical support at Tieline to discuss this problem, and Bryan Harper suggested updating the firmware on all of the Tieline units. Firmware upgrades were downloaded to my local computer, then uploaded to the Gateways and Bridge-IT XTRA codecs, but that still did not rectify this problem. Listening on the



Listening on the factory installed HD receiver in my Jeep Renegade, the signal is crystal clear, as is the output of the Inovonics 551 modulation monitor. I still have several other tests I want to do to try and isolate this issue, so I will hopefully have more information to provide next month.

On Tuesday, September the 8th, I installed a new BE IDi-40 importer for WDCX-FM,

replacing a really old importer that we have long been using to generate our multicast stream. This allowed us to begin transmitting HD graphics along with our PSD data.

The graphics look awesome! Cris did a wonderful job getting the TRE middleware programmed to send the graphics. Josh Meyers will be getting more graphics loaded (advertising sponsors) in the next month or so, with the hope that we can add additional billing with providing sponsors logos, etc. to our data streams.

An additional item I installed last month was a new streaming encoder computer for the Legends 102.7 stream in Rochester. The old encoder was a Windows 7 platform, totally unsupported with numerous security issues, so Don Crawford Jr. purchased a new computer with Windows 11. On Tuesday October 1, Cris and I completed the installation, and the new streams are up and running with no issues.

While getting the computer set up, I had a problem with the computer recognizing the Creative Labs Sound Blaster card. No matter what I did, it would not show up in the Device Manager. After deleting the driver and reinstalling it, again, no sound card. I rebooted the computer several times, after each reboot, checking the Device Manager. Still no sound card. During the third reboot, I plugged in the 1/8" plug into the line in jack, and voila! The

computer saw the sound card finally! Evidently, this is an issue with the Sound Blaster card playing nicely with Windows 11. Go figure.

The rest of October has been filled with getting our sites prepared for the upcoming winter months. The winters here in Western New York can be downright harsh, so getting everything winterized has been given top priority. Hopefully we will not see a repeat of last year's eight-foot blizzard!

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 happy engineering!

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

Optimizing Dual WANs

One of my goals has been to get rid of the DSL service we have at one of our transmitter sites.

It's super slow, was nearly impossible to get fixed when it stopped working a few months back and has crept up to an extreme \$235/mo.!

I've had good luck with ViaSat at transmitter sites, so I decided to install that at our WRDT nighttime transmitter site where I was pulling out the DSL. Along with the installation I wanted to finally tackle the frustrating dual WAN router. I've had a few different types of these but have been routinely frustrated by their lack of features. They're designed for

the singular purpose of maintaining an internet connection for usage at their location. Understandable, but they're no more useful than having a person move the WAN cable to a different ISP should the primary ISP connection go down.

What I have always wanted was a router that would allow port forwarding from either WAN. With this I could stream from our studio's CODECs to two discrete CODECs at the transmitter site. One on each ISP. This would be simple to do using two consumer grade routers keeping everything separated. But that leaves you with no site control should the ISP to which it is connected fail. This has happened to me, so I feel a compulsion to use the ISP redundancy we have at the site to avoid this vulnerability. Add to this that WRDT's new pre-sunrise/post sunset authority (PSRA and PSSA) that I've written about here requires both sites to communicate for the handoff in the morning and evening.

I have some ideas to failsafe this site handoff process and have already built macros to detect if more than one site is on the air, but these or for contingencies. The concrete way to do this would



be to create a point-to-point VPN that takes advantage of the dual WANs at each location.

I have a way to go before I have the VPN connection, but it seems doable and the absolute best way to fortify the inter-site connection.

Much Droning

This autumn I was assigned the task of video recording each of our towers with a drone. Being a licensed drone pilot gives me the authority to fly but not everywhere automatically. Licensed drone pilots are required to operate safely and within the FAA regulations whereas hobbyists can fly with less constraint.

For me, this means strict adherence to restrictions in altitude and airspace. Unfortunately, ten of our towers are located inside the class B or "Bravo" protected airspace of the Detroit metro area's international airport, KDTW. This airspace restriction extends to the ground, so drone flying is absolutely prohibited. This was my first concern and meant that I would have to go through a lengthy process of applying for a waiver from airport flight control.

Fortunately, the FAA has come through for folks needing to fly in controlled airspace with a service called LAANC. The FAA describes it this way: "LAANC is the Low Altitude Authorization and Notification Capability, a collaboration between FAA and Industry. It directly supports UAS integration into the airspace." UAS stands for Unmanned Aerial System, what we call "drones." What LAANC does is provide drone pilots access to airspace below 400 feet (the usual ceiling for drones) via computer or mobile app.

I was unable to obtain approval directly through my provider's app, but via their website, approval was nearly instant and was reflected on the mobile app and with a text message. I used Aloft for my connection to the LAANC system and application for clearance was super easy. Go to the Aloft website, fill in the date and time window for your flight, draw the perimeter of your flight boundaries on the online map, submit and wait for approval.

Nineteen flights were needed to record the towers Crawford owns here in metro Detroit. The two towers in Detroit at our studio building are selfsupporting and therefore taper outward at the bottom, one 500 feet and one 400 feet in height. This made it necessary to keep reversing away from the structure as I started from the top going downward. There are many appurtenances on these towers and colliding with one as I lowered the aircraft was my biggest concern.

Next, I recorded the towers in Monroe. WRDT has four top-loaded towers that are 417 feet high. The capacitive top load is made up of horizontal wires stretched between the guys near the top of the structure. This required the drone to be flown over the top-load wires up to the towers' top beacon, then threading the needle on the way down, between the top-load wires and the tower itself. At 400+ feet from a 15-inch X shaped drone, it's tough to see exactly where you're at up there!

After receiving the aforementioned flight authorization, I recorded the ten 200-foot towers at WMUZ-AM in Huron Township. These towers were simple largely because only one had any attachments. Tower three holds an 11 GHz microwave antenna and a smaller dish that connects the microwave radio with the transmitter building on the ground.

Last, I flew the drone at our 180-foot tower in Ferndale, which is the second tower in a two-tower array there. The main tower belongs to the Audacy FM station collocated there. I also collected photographs of each guy wire anchor as a part of this project. All of the video and photographs turned out great, thanks to good weather and the low angle of the sun at this time of year. I enjoyed all of the flight time, too!

Is it Mackinac or Mackinaw?

One of my best friends had his milestone birthday on Mackinac Island which is located in the Straits of Mackinac just north of Mackinaw City. Yes, I'm spelling them both correctly. The island is roughly between Michigan's north and south peninsulas. Mackinac Island is a beautiful and famous place which has several large hotels, many built over 100 years ago. The island is unique in that it has a ban on motorized vehicles. Once you leave the dock it's bikes and horses (and I'm no friend of either). Mackinac is loaded with bars and restaurants, so the island and my friends are well suited to one another. While I was enjoying my lunch with a cold Guiness, my phone lit up with several text messages telling me something was wrong back home at the stations. I talked with our ops manager, Vito, and confirmed my worst fear, being off the air and out of town.

Don't panic, I thought, Mackinac, while maintaining its primitive transportation style, has excellent cellular service. I shifted my cellphone down into overdrive and restored the NexGen's connection to the database server without spilling a drop!!

I'm ever grateful to have so much access preconfigured on my phone. I have shortcuts to just about everything, and as I discover new things that might require my attention remotely, I'm always careful to remember to add them to my phone.

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

Painting, Painting, and more Painting

As I write this, we're having a couple of things cleaned up on the painting job that we had

done in October at our WXJC-AM five-tower directional site. I've been employed by Crawford Broadcasting for 23 years, so it isn't that I haven't been around tower painting projects before. We've painted one, two or even three towers at the site previously, but never have we painted all five at once. It had been over a decade since we had any painting done at the site, and when it was done then, only three of the towers had been painted, so it was a project that definitely needed to be done.

Our WXJC(AM) site is only four miles or so from Birmingham's Shuttlesworth international airport. To be honest, sometimes when I'm out there, it appears that a number of jets are going to scrape the belly of their fuselage right on the top of our 350foot towers. It is then that I simply close my eyes and say a quick prayer and within a few short seconds, it is all over and I go about my business. So I'm glad that the fresh paint provides pilots with a better chance of actually seeing our towers.

Overall, the crew of four guys from Pensacola Tower Services did a great job. The project took eight days to complete, and besides the painting included plumbing all five towers and tensioning all of the guy wires. As I told Jack Bonds, while we certainly had other things that we could be doing, I would rather that the crew take their time and do the job correctly, and that certainly happened in this instance.

From the tower site and then back to the studio on Friday the 25th, Frank Franciosi and our program director, Justin Flores, had found a contractor to trade some paint work at our studios. So their crew is currently in the process of painting all of the offices, hallways, conference room, kitchen and green room for guests (which oddly, isn't painted a shade of green) as I write this article. We had a well-meaning employee and her husband that had gone around and touched up the walls here. The person that tinted the paint was apparently in the OJT



phase of their employment, so the effect on our walls was that the color was not correct and we had blotches of slightly-off-original paint everywhere.

This crew looks to be doing a professional job, and we look forward to the outcome here as well.

Another Market, Another Firewall and a Problem Solver

Our temporary firewall solution got passed from Todd Stickler in Los Angeles on to Steve Minshall and company in northern California earlier in October.

Beyond a hiccup or two that Amanda had in Denver, she finished her three upgrades in record time. One of the features of her installs

was that each of their firewalls had a single ISP and single LAN hooked to each, so only two NICs were necessary. Los Angeles was similar, but we had a little issue getting one of them installed. When Todd sent the temporary firewall to Northern California, a couple of settings were left from his install that we just missed before it got sent, and it caused a problem at KCBC.



Slow and steady wins the race. New tower paint at our WXJC(AM) Tarrant, AL tower site.

At KCBC, they have two service providers feeding their site, one is a PPPoE wireless connection and the other is a ViaSat internet connection. No matter what we tried to get the temporary box online, the PPPoE connection and ViaSat wouldn't cooperate. I ended up calling their PPPoE provider, Velociter Wireless, and explaining our situation – I was remote in Birmingham and we're swapping to

PfSense.

With a little groveling, their tech was extremely helpful, and he was able to give me all of our account provisioning details. He also provided some pointers for setting up the PPPoe in PfSense, but the box still wouldn't work. I ended up having Steve send me the box so that I could reset the machine back up and make sure that all the settings were as they should be. It was then that I saw the settings that we missed and got them corrected. I turned it back around to him the same day and he got it a couple of days later.

On Friday, October 25th, we got KCBC on the temporary solution so we could focus on getting PfSense on their Dell Poweredge server. Currently, we have PfSense installed but are running into a LAN issue. New PfSense installs require an internet connection in order to register the system and download several complimentary install packages.

How do you get the Dell on the internet when your internet options are going into the temporary box? Well, you give the Dell a LAN address and allow it to get out to the internet, but then you have a problem. At some point you have to restore a backup PfSense configuration from the working temporary box to the new install on the Dell, and when that happens, it has the same LAN address as the temporary box – oops!

The specific issue is that when I upload the configuration to the machine and save it, the machine is changed to the new LAN IP address, but PfSense has another button that I have to push to "Apply Changes," and since the IP address changed, I cannot see that button any longer since my browser is looking at the old IP address. I know, it's muddy.

The process is fairly straightforward when you're in front of a machine and need to do this, but what about when you're remote and need to see a screen as if you were local? Since teleportation doesn't exist yet, you have to come up with another solution.

One such solution is an IP KVM. IP KVM units have been around for a long time. If an enterprise allows remote access as a part of their security protocol, they are what a number of them use in order to remotely administer their networks and machines – even if they have to do a reboot of a particular machine, the machines video output remains. The problem is that these IP type of KVM units are prohibitively expensive, especially for small business IT people that may only need to manage a handful of servers in this way.

Recently, a number of IP KVM solutions

Theman / Andded / T	0113		
The alias list has been changed. The changes must be applied for them to take effect.			Apply Changes
ID Dorte LIDLe	AL		
Firewall Aliases Ports	Values	Description	Actions

Where, O Where has my little button gone?

have come out that offer what a number of the enterprise level solutions offer, but at a more reasonable price for small business. Specifically, Pi-KVM (<u>https://pikvm.org/</u>), nanoKVM (<u>https://github.com/sipeed/NanoKVM</u>) and JetKVM (<u>https://jetkvm.com/</u>) have been thrust onto the market. These tiny IP KVMs are meant to give you IP remote access to a machine and don't break the bank.

The PiKVM units are obviously based off of the Raspberry Pi, and since the Raspberry Pi has a variety of form factors, they run anywhere from \$230 to \$384, depending on what version you run. If you have a Raspberry Pi already and desire to build your own, you can simply order the "KVM Hat" that slides onto their GPIO for about \$150 and run through their build documentation.

The NanoKVM and JetKVM come in at around between \$60 and \$80! The NanoKVM is available now, and the JetKVM is in kickstarter and delivering in December.

The thing I love about all of them is that they remain true to open-source design. The designers have put together some hardware that is extremely useful at a great price point. All are still in heavy development but are completely functional, and new features are being added all the time. I don't think it fits our timetable for getting the KCBC firewall project done, but I can tell you I'll likely be ordering a JetKVM just to have on hand for future projects just like this where it would be really helpful to be local in a virtual way.

We'll visit again next month on these pages so until then May God bless the work of your hands.

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

By now, I'm sure you've all seen and heard the stories about the devastation caused by Hurricane Helene. Even though it had weakened to a tropical storm before arriving in Western NC and Eastern TN, they got hammered. Those hills tend to focus a heavy rain, and gravity does the rest.

That really hit home with me, because this area was one of my late wife's favorites. We would take I-40 between TN and NC; Sandy called it "the cut;" it's closed until further notice. We would ride the Blue Ridge Parkway for hours; it's now closed through most of NC. We also spent a great deal of time in the Lake Lure/Chimney Rock area of NC, which has been utterly devastated. I still have family and

friends up there; my cousin Jackie

lives near Boone, NC, and my sister Petria's in-laws live in Swannanoa, NC. They're all OK, thank the Lord, but the destruction simply defies description. If you can give to help the folks in the mountains of NC, SC and TN, please do so.

Great Aunt Maude

Once again, my twisted brain brings back old and odd memories. Annie Maude Poole (my grandfather's sister) was a true character. She and her sister Ina had a time running their little house in Raeford, NC, but rule it they did, with the help of Aunt Peggy, Aunt Isabel and 2nd cousin David. Another sister, Aunt Mary, lived elsewhere, but behaved much the same.

This was in the late 60s and early 70s, which saw a lot of violent protests. When the evening news would show college kids bleeding and running from cops in riot gear, Mary and Maude would shake their heads. "That's not real. That's ketchup, not blood."

Maude was most (in)famous for cranking out Christmas fruitcakes that were bio-weapons. Oh, they were made in a bundt pan so that they had the convenient grab hole in the middle and they were filled with mystery fruit, as usual. But her cakes were unusually solid. And heavy. And so fortified with rum that – I'm not making this up! – I once watched a house fly flit too close to a Maude CakeTM. The vapors instantly knocked out the insect. It landed on



the table, twitched a couple of times, and then lay still.

Now let me set a picture for you: we're sitting at the dining table in our home, finishing up an excellent holiday dinner. Maude was there with Ina (I believe it was, or maybe Mary) while dessert was

> being served. I was eating a fabulous apple pie with vanilla ice cream. The fork was headed toward my face when one of the sisters said, "Yeah, this is nice. A lot better than the Christmas when I broke my leg."

The other sister replied, "That was nothing compared to the time I broke both arms! Compound fractures, with the bones sticking out and blood everywhere!"

First sister says, "What about that summer where I had the

festering sore that drained down my leg into my socks ..."

It continued from there. All of this while we're trying to eat. And to cap the festivities, when Maude found out that I played guitar, she demanded that I bring it to her. She grabbed a knife off the table and starting trying to play slide. (The operative term here is, "trying.") Imagine an out-of-tune, gnarlysounding Hawaiian guitar being strangled by a madman. She eventually made a face, thrust the guitar back into my arms and said there was something wrong with it.

Maude, Ina, Mary, Peggy, Isabel and David have all passed on now. But Maude, in particular, came to mind when I was trying to puzzle out the secrets of SNMP (more in a moment). She was barely able to dial a telephone without injury. She passed away in the 1980s, long before computers and the Internet. But the very thought of her with a PC, trying to Google something – much less trying to comprehend SNMP – makes me itch. Uncontrollably.

SNMP is NOT Simple!

You have to love Ubergeeks. If they write a solitaire game, it will have configuration options that would baffle Einstein. It would include an analyzer that tells you whether you can win the game or not. It will offer dozens of different card decks, most of which are very difficult to decipher on a computer

monitor: "Is that a King, a Joker, or did I smear mustard from my sammich on the screen?"

Well, the Neck-Bearded Ubergeeks had a field day when it came time to develop a system that would allow you to monitor network devices. The official name is "Simple Network Management Protocol." This just makes me fear (deeply) what they might describe as the "Complex Network Protocol."

In principle, it's simple: SNMP allows any capable, network-connected device to respond to queries and to report alarms (called "traps" in SNMP-Land). The equipment to be monitored is supposed to be described in a "MIB" file, or Management Information Base. I suspect that the Geeks who picked this acronym were fans of Will Smith and Tommy Lee Jones. I think MID (Management Info Database) would make more sense, but we wouldn't like them when they were angry. MIB it is.

The MIB

If you need your head to catch on fire, download a few MIBs from the Internet and go through them. They're written in something called "Abstract Syntax Notation One," which initially led me to fear that there were others ("2," "3," et. al.). Fortunately, we can stick with Number One. Here's an example from one of the publicly available files, named "EtherLike-MIB.txt."

EtherLike-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, OBJECT-IDENTITY,

Integer32, Counter32, Counter64, mib-2, transmission

... followed by a whole bunch of gibberish. I was amused to see that "::=" operator. The Python programming language just introduced a walrus operator (":=" ... look at it sideways and you'll get it). Ergo, a MIB file uses a double walrus. This is undoubtedly the most significant thing that you'll learn this week.

Fortunately, with the Burk remote controls, you don't necessarily need the MIBs for all of the equipment that you might want to monitor. But you will need ...

OID

... which stands for "Object Identifier." This is the actual meat and gravy of the thing; you'll need an OID for each and every item on the network that



SNMP illustrated with loving care.

you want to monitor, control or collect "traps" (alarms) from.

One term that you'll frequently encounter when looking over TrueGeek code is "global." Ordinary mortals, when handed that term, think of Earth. Lots of nations. Continents and countries. But a TrueGeek calls anything that can be accessed from more than one small location (or file) "global." However, to be fair, I guess it applies to SNMP. The Geeks apparently have moist-eyed visions of everything in the world (if not the solar system) interconnecting, all spitting gibberish at everything else.

Anyway. Fortunately, Burk allows you to specify a target IP address and a "raw" OID, the only part of which is really important to us is the command or data being returned. But just so we can say we did, here (briefly!) is how an OID for Nautel might be laid out: 1.3.6.1.4.1.28142.[instruction or data]

The first three characters (1.3.6) indicate that this OID is in the ISO "arc" ("1"), an identified organization ("3"), and the "6" is for the Department of Defense. The DOD invented the Internet, after all, and we can't forget that or aliens might vaporize grandma.

The remaining numbers are:

- 1 Internet
- 4 Private (5 would mean "Public")
- 28142 the enterprise identifier; in this case, Nautel

This would be followed by instructions for a "set" command, or the return data from a "get" request. A trap is similar; it would be followed by specifics of the alarm or condition that caused the "trap" to fire.

There! See how "simple" this is? And by the way, my sharper readers might wonder, "You mean every enterprise is expected to register and get a unique ID number? Yup. For example, Intel has been assigned ID # 343. So who is # 1? Cisco (registered

as "NX Networks"). For the curious, #2 is IBM and #3 is Carnegie-Mellon ... you can browse to iana.org and look up any OID enterprise number, if you wish. You'd probably find an old phone book more exciting, but hey; have at it.

WHY??

It's simple: for better or worse, many of our equipment manufacturers are now using SNMP for remote monitoring and control. Think of it as analogous to Audio-Over-IP: instead of running a madman's hairdo of control wiring to each piece of equipment, if we use SNMP, we can do it over a single network connection per device.

Cris and I are working on adding SNMP agents (i.e., in our case, the thingie that will respond to the Burk) to older equipment, whence my studies of the protocol.

But that's enough for this time; don't forget to vote and keep praying for this nation!!!

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

This last month has brought changes to our Chicago engineering department as we have had a realignment of staff in general at the radio stations.

This has caused me to take on a great role in the day-to-day problems of IT, all the while still having several large projects to manage in the next six months.

This has caused me to look at the IT needs of the overall market and how I can best reduce the amount of time necessary to address those needs. Firstly, I have looked at what I call the major issues and the minor nuisance problems that come along.

The major problems that may not come up as often, like broken hardware, can really only be lessened by having less hardware. That sounds

like an obvious statement, but as I survey the way we operate currently, it really is a way to reduce time spent on IT needs.

Like most companies, we have really changed the way in which we operate post pandemic. We used to have two separate offices with a VPN link between the two. Most of the office staff had one computer at one of those offices. We had a rare hybrid employee or two that would need a computer at both sites.

Fast forward to 2024, and many of our office staff are working remotely with computers at home, either company owned or self-provided. However, most of them are still using computers at the office in which they use VNC over VPN to work remotely, or they use them when they do come into the office.

Double the number of computers and double



the amount of IT needs per staff member. Even if we may not be ultimately responsible for the hardware of the self-provided computers, we still often have to

> assist with issues on those computers. Reducing redundant hardware is one thing I am looking at to streamline what we have to do as an engineering team.

Another thing we are looking at is changing some of the serverbased models from an onsite server to cloud based. Some of our functions have already been moving to the cloud. This has caused us to ask the question of whether we should move even more functions to the cloud and not have to be rebooting and maintaining onsite servers.

The other issues, which I call

nuisance issues, need better management to keep them at minimum. Much of this has to do with email. What I see mostly is due to poor management by the individual users, and a great portion of that is storage. I am looking at ways to simplify this for the common users to keep from having to spend so much time helping them delete old emails.

Streamlining the needs of these users will in the long run hopefully pay off with less of these nuisance calls. I am just in the first month of consolidation, and I am sure that as more problems arise, I will be asking the question I always ask: "How can I make this happen less often?"

NV40 Update

As mentioned in recent articles, we had a major event affecting the auxiliary transmitter for WPWX. This is a Nautel NV40 transmitter that has

given us more than a decade of mostly worry-free operation with very little issues, with most of those being power supplies and power amplifiers.

Back in June, we had a lightning event that caused us quite a lot of damage to mainly the 48-volt system that distributes current to the cooling fans in each of the power modules. We also had some power amplifiers in some of the modules that needed to be replaced.

In all, of the 16 power modules, 14 of them

needed at least some part replaced, and some needed multiple items replaced. It took us a while because as we replaced some parts, more issues would show up.

I am glad to report that we have repaired all the modules, and the transmitter is ready to go when we need it. Our expectation is that this will still be a long-term option for us as a full-power standby transmitter. I would expect to see it in place another decade from now.

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

What a month it has been. It has been abnormally warm this October. Fall tried to show up earlier in the month but only lasted a couple days

before the temperature got to the upper 70s, low 80s. Of course, as I write this, we are expecting cooler weather and rain/snow.

Construction Zone

Our office has been one construction zone after another, much like many of the roads around Colorado. We received notice that the asphalt on the parking lots and driveways on the property was going to be

redone. Not just repaired as in years past, but rotomilled down to the dirt and repaved. It took a full week. They did whatever repair work they needed to the curbs and other concrete and then repaved with asphalt. It was a headache as access to the building changed every day based on where they were working, but it's great having nice, smooth, shellcrater-free driveways and parking lots!

We also are getting new carpet and a fresh paint job across our office suite, courtesy of a new lease. This has also been a headache. They are doing this in three phases. The first phase was the main area where the cubicles are and the hallway that goes to the private offices. The next phase was the offices themselves. The third will be the studios.

The crews come in on Friday evenings and move any boxes and furniture out. Saturday is painting and carpet replacement, and Sunday is moving things back. Sounds easy right? WRONG!



For the cubicles I had to remove all the power outlets and phone/internet boxes from each one.

We then had to pack up all the items in these spaces. Same with the offices. The studios will be the easiest as we can't move the furniture out. I will have to move some computers and UPSes onto the tabletops, but other than that, there's not much to do.

With the two phases done, the office space already looks amazing. I am grateful that we are able to get this work

done.

The next construction zone hopefully won't affect us, but I hear they are going to clean and repaint the stripes in the parking structure, something that is also much needed.

KLTT Repair Work

I was finally able to get some of the repair work done at KLTT. On the 12th of last month, I drug my husband out to the site... okay maybe not, he was a willing participant because he loves me. I had three things I needed to get done. Repair the Austin ring transformers, hang some signs on the towers and finally fly the drone to inspect the tower and guy anchors.

We began going in order starting at tower 1. I knew the Austin repair was going to be a process as the paint takes forever to dry. We got the first layer done at tower 1 and moved over to tower 2. My

husband actually noticed it before me. He asked me about the Austin and was wondering if they should be touching. They should NOT be touching. Upon further inspection, we found the union that attaches it to the tower was stripped. We left it while we continued on with the repair work, the station was thankfully working fine.

We got the four towers done with the first part of the repair process and made a trip to Lowe's to find a new union to repair the connection to the tower. We found one union, the last one in the size we needed. We had some rope at the site that I had at some point taken out to help me get some water onto the roof. Jordon, my husband, was able to suspend the fallen Austin to allow us to get the union on.



A new union in place, the Austin at KLTT tower #2 is again secure. We still need to spot-weld the joint to keep it tight.

We were able to get the Austins at all the towers repaired with no more issues. Once we did that, I flew one of the towers with the drone and then let me husband, who flies drones professionally in the oil field on a daily basis, do the rest. I knew it would be much faster. He is a very talented drone pilot and is very comfortable doing it.

It turns out that this site had the new RF radiation signs already hung up, so that was one less thing to do.

We moved on to KLZ afterwards to repair those Austin ring transformers. I also needed to hang the signs on the towers and fly each tower. It was a very long day to say the least, but we got the work done. I am very grateful for my husband. It made the process go by faster and no doubt, that Austin might still be sitting on itself.

AMPFET 10 Transmitter

Finally, after five years, we found a new home for the old KLZ Nautel AMPFET 10. It served as the backup transmitter at KLZ for years. It's a beast! We installed an NX-5 back in 2019 and moved the ND-5 to the backup position. The AMPFET 10 was sold to a broker, and we had been storing it in the KLZ transmitter building ever since.



Dressed for success – this Tyvek suit kept me from epoxy paint free.

It was a chore to get it out of the building, though. Even with a dolly, the thing was just too heavy -750 pounds or so.

A few days before the truck came to pick the transmitter up, while doing the Austin transformer repairs, Jordon and I got some boxes and basically "boxed" up and wrapped the AMPFET 10, so it was ready to go.

The day the freight company came, Dad and I went out there and were able to use the dolly to assist us in moving it to the loading dock. Then we used the bucket on the Kubota to get it off the dock and into the truck, which was too big to fit through the garage door to the dock.

We had to fight with the driver since he said he couldn't take it since it wasn't on a palette. After some back and forth, he changed his tune and said if we loaded it onto the truck, they could crate it at the

warehouse. So that's what we did.

I am sad to see it go - it had been at the site since 1983 - but glad it will have some new life helping another station get on the air.



The AMPFET 10 all boxed up and loaded on the truck (sniff).

Ubiquiti Issues

One day last month, I started getting PRTG notices from our Tieline Gateway 4 at KLZ. The connection was coming and going. I started digging into it and never heard the station go off air. It was staying on the Gateway, so I assumed it was some random issue. Then I woke up and remembered we have a second feed going to the backup internet side of the codec since the Gateway 4 can have two network connections. It uses what Tieline calls Smartstream Plus to provide and time align a secondary feed over the internet. Silly me, I forgot about this. Anyway, it was working great. I never heard it switching between feeds.

I began digging more into the connectivity issue and found the culprit to be the Ubiquiti

PowerBeam located on the building that points up to the tower. This short-haul wireless link connects the Cambium PTP820S 11 GHz microwave radio to the network in the KLZ transmitter building.

I could not get the issue to resolve with any reboots or power cycles, so I went to the site and replaced the antenna (which contains the 5.8 GHz radio), but that did not solve the issue. I ran various scans from the unit and saw no interference or noise. At one point, to eliminate the cable as the possible cause, I ran a new CAT5 temporarily up to the roof, again with no change.

At that point, I decided to change the frequency on the pair to see if that would have any effect, and voila! That seems to have fixed the issue. I'm not sure why the spectrum scans didn't show anything. but clearly, something was interfering with the short link. Whatever it was must have been right there and very strong.

Coming Up

This fall, I still need to make another trip to KLTT to repair the copper strap that the horses have exposed and torn up. I may go ahead and clean the AC unit's condenser coils. I look forward to things slowing down some.

I have registered for RCS Academy's Zetta Bundle. It is the Zetta course and Zetta Engineer course. With our upcoming move to Zetta next year, I figured I should prepare myself. I look forward to learning more about it all from the user side and engineer side.

At the various sites, I just need to clean things up. Something perfect for a cool day.

I think that about covers all of it. 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/100.7 MHz, 5 kW-U, DA-1 KLDC • Denver, CO 1220 kHz, 1 kW-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 • Brighton-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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