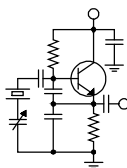


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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A Full Year?

Can it have really been a full year this month since we completed the move of KLDC in Denver from Ruby Hill to the KGNU site? I saw a “memory” pop up on a social media site showing Amanda and Seth Peterson working at Ruby Hill, with the aux transmitter and antenna switch already gone. I could hardly believe it, but the calendar doesn’t lie.

A year later, I still marvel at that project. It was a huge “DIY,” and with the help of Stephen Poole, we got it done on time with minimal down time.

The new site has been great. It certainly has its challenges – we share it with a big drywall supply operation that has both indoor and outdoor material storage and frequently takes deliveries by rail on the track that runs into the site. Without fail, we find ourselves dodging forklifts and delivery trucks when driving into the site, but it’s a good prefab building and everything stays clean inside.

As for performance, I’m still amazed. Coverage is great and digital performance is very robust, better in many respects than our other Denver AM stations. This is due in large part to the diplexer, which was designed from the get-go for HD Radio, but some of it I can’t explain. It just works, and it works very well.

I’m proud of that little station, and I’m a regular listener, even to the 12-watt nighttime signal as I drive in every morning. We really couldn’t have done any better with it, and with its state-of-the-art studio and transmitter site, it remains a key part of our Denver operation.

Why So Hard?

So far, this year has been exceptionally difficult in terms of getting projects and even routine

tasks done in our technical operations. Everything has taken a lot longer than it should have. Crazy things have happened. A verse from the Scriptures comes to mind: “It is hard for you to kick against the goads” (Acts 26:14). As we enter the inventory and budget season, I sure hope that things will go more smoothly than they have so far this year.

Not that it’s all bad. Thinking back over the year to date, we got Buffalo moved into a new, state-of-the-art studio complex, we got that market up and running on its own Part 101 microwave system, and we got the 80-year-old broken base insulator replaced without issue.

In Detroit we got the new equipment storage/maintenance building constructed, and we got the new 100 kW studio generator installed... but not commissioned because we’re still waiting on the local utility to upsize the natural gas feed to the facility. We did get the new Telos VXs on-air phone system installed and working.

We have had similar successes all across the company, but almost all of them have been... difficult.

I’m looking forward to being done with the remainder of this year’s projects and taking a breather for a month or so at year end. Will that happen? I wouldn’t bet on it.

All-Digital AM

Regular readers have no doubt seen in these pages that we are converting WYDE(AM) to the MA3 all-digital AM mode effective September 1. In preparation for that, we had to file a notification with the FCC that subsequently went on public notice. The trade press picked up on that, so you may have seen bits in different trade pubs about the change as well.

Apparently, this conversion will make our station only the third in the nation to be (currently)

operating as all-digital. That really puts us on the bleeding edge.

What are our expectations from this? As I told our friends at *Radio World* and *Inside Radio*, our expectations are totally based on what we've heard and read about Hubbard's five-year "experiment" with all-digital AM on WWFD in Frederick, MD. The results there have been encouraging, but so much is dependent on factors beyond the technical.

For one, is the number of HD receivers in the Birmingham market significant, or are there just a handful? That's hard to determine with any certainty, but with so many auto manufacturers including HD Radio in their entertainment systems these days, our bet is that a lot of people have the capability but don't know it.

Some of the results are dependent on us and our ability to get the word out by way of on-air promos that we have the all-digital offering. I have a couple of thoughts on that, and I need to really flesh out those ideas in the coming days.

My initial inclination is to run an aggressive schedule of on-air promos (that will air on both the all-digital AM and on both simulcast FM signals) telling listeners that we have an all-new totally digital signal up on 1260 kHz and encouraging listeners with HD Radio capability to tune in. The all-digital AM coverage will undoubtedly eclipse that of either of the FMs.

I don't, however, want to do that until we have had an opportunity to thoroughly evaluate the performance ourselves. We certainly would not want to send listeners to listen to this cool new digital signal if it sucks. I'm not too concerned about that, because we did run some brief overnight tests and know that it does work, but in the presence of skywave interference and with limited time available in the experimental period to drive the signal, we got only a cursory look.

So... by this time next month, we should have a much better idea of how well the all-digital signal performs, and hopefully we'll get some good listener feedback as well.

Licensing and Management System

Well, they finally did it. Sort of. In late July, the FCC moved AM to its Licensing and Management System (LMS). They moved TV to that system before repack, then followed with FM some time later.

We were all dreading the transition of AM to the new system, and I was hoping they would give up and just leave it on the Consolidated Data Base

System (CDBS), where it had been running so well for many years, but it was not to be. The move has been made, and while it has not quite been an unmitigated train wreck, neither has it been a smooth, seamless transition.

LMS has been a long, long time coming. I remember attending an NAB Radio Show in Washington, DC many years ago and watching an LMS demo provided by the FCC's Jim Bradshaw. It was exciting, and it seemed that the transition was somewhat imminent even back in the late-2000s, but here we are almost 15 years later and are just now completing the transition.

There are a lot of good features in the system. It provides "one-stop shopping" for Media Bureau filings, which is very handy. Even AM direct measure applications can be filed online in LMS, a huge improvement over the paper filings that we were stuck with in CDBS.

The problem from my perspective is that the transition was made just a bit prematurely. One critical table in the database, the one that has information on international coordination, is not populated. This is important information, as the international coordination status of applications, permits and licenses affects how we deal with them in various studies, particularly night limit studies.

For example, if Mexico or Canada sends an application to the US for coordination and we object because it would produce impermissible interference to a US station, the US would object to that application and it would, in the database, carry an objected status. When running a night limit study, we would ignore that application in night limit calculations. But without that information in the database, we don't know how to treat foreign records in night limit studies.

So what do we do? The FCC pretty much told us (offline) to continue to use CDBS for night limit studies. That works pretty well. There are very few new filings in the LMS AM database since late July, so the CDBS database is still mostly current. We just have to also run the studies in LMS to make sure that there are no new records that must be considered. And that extra step requires making some judgment calls that make any such study anything but automated.

I really don't know what the holdup is here. It would seem to me a fairly simple matter to propagate the LMS table with data from CDBS, but there must be something else going on. The FCC folks assure me that the fix is coming. We just don't know when.

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

Hello to all from Western New York! It is hard to believe that Labor Day is almost here. Labor Day ceremoniously marks the official end of summer in our region.

After September rolls through, you can expect almost anything weather-wise in Western New York. It is not uncommon to see accumulating snow one day and eighty-degree temperatures the next, much like the weather in the Denver area.

That said, we will need to begin winter weather preparations at our transmitter sites soon. We still have a couple of projects to wrap up before the snow flies, and both are at the WDCX-FM transmitter site.

One is an air conditioner replacement, and the other is removal and replacement of our failed 50 kW generator. The lead time on the A/C replacement was rather lengthy, and if it doesn't happen soon, it will not present a big problem as the A/C rarely runs during the winter months. However, the generator project is a big deal, as we will lose power at the transmitter site at some point during the winter months, that is pretty much a guarantee! Our generator contractor, R.B. U'Ren, will be checking with the manufacturer, Gillette Power Systems, to try and nail down a specific delivery date.

Once they receive the unit in Niagara Falls and complete pre-installation prep, they will schedule a couple of days to get the old generator removed and get the site prepared for the new one. The new generator is a 100 kW model, which is double the size of the old unit. When we purchased the 50 kW generator, we did not have A/C in the transmitter building, we didn't have HD Radio, and we didn't have the Nautel NV40 transmitter. When we moved the entire transmitter plant into a new ThermoBond building in 2007, the wattage demand significantly increased, and at times the old 50 kW genset just

could not keep up with demand. On very hot days, we had to shut off the A/C if we lost commercial power, not a very good situation! I'm not going to miss those occurrences.

One of the smaller projects I got completed this month was the programming and installation of our back-up audio codecs for WDCX-FM and WDCZ. The Barix SiteStreamer 500s were programmed on the workbench and tested before installation. These units will provide analog audio to the Omnia processors in the event of a TieLine codec or microwave link failure. The

Omnia's will automatically switch over to the analog inputs should we lose the digital input.

Cris has been working diligently on getting SNMP set up on our equipment so that in the event of a failure, we will be notified immediately. How did we get along without all this new technology years ago?

Several weeks ago, I received a phone call from a very young sounding engineer from Canada. He stated that his station was located approximately 140 miles due north of Toronto, and that WDCX-FM was completely blanketing his market, drowning out his signal! He inquired as to what power level we were transmitting at, and if we recently made any changes to our transmitting equipment. I'm relatively sure he got rather annoyed at my chuckles, as I was sure that he really didn't have a clue as to what was happening.

For the next 20 minutes or so, I explained about thermal ducting and its effect on FM propagation. Almost every year at this time, the atmosphere presents a perfect storm of warm/cold air masses high in the atmosphere, that FM waves can travel thousands of kilometers beyond their expected boundaries.

Several years ago, I received two different reception reports from Capetown, South Africa with



audio recordings of WDCX(AM) from Rochester, New York! Folks, that's over 1800 miles for our little night-time powered 2.5 kW signal to travel. Had it not been for the actual audio recordings sent with the reception report, I would not have believed it! I absolutely love to receive DX reports, and always make sure that they are answered promptly. Unfortunately, the number of persons tracking down and reporting reception of faraway AM signals is

dwindling. I guess kids these days have no interest in radio and RF. It's a shame, as they have no clue as to what they are missing out on!

That about wraps up another month here in the great Northeast, and until we meet again here in the pages of *The Local Oscillator*, stay safe, and happy engineering!

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

In last month's *Local Oscillator* (August 2023), I proclaimed that "We've had more dadgum rain than I can ever remember." Well, the rain continues, and while the rain continues, I endeavor to stay dry.

Last night, I witnessed the road I live on turn into a river, and one of our transmitter sites has become several small lakes. Thankfully, neither my home nor that transmitter site suffered any damage as a result. I saw some homes in my area that were much less fortunate, obviously being flooded.



Transmitter Modules

I'm sure readers will agree that living in the age of transistors and silicon chips is a true and undeniable privilege, but like anything else wrought by man, they're subject to fault and failure. This summer, we've lost no less than three modules in our solid-state assortment of transmitters.

Solid-state transmitters are terrific, reliable, and sound fantastic. Among their advantages are smaller size, hybrid amplification whereby both analog and HD Radio signals can be transmitted simultaneously, and failure modes that generally result only in a lower power output rather than complete off-air situations.

These solid-state transmitters use from one to many power amplifier modules that are all fed by a common low-power representation of the desired final output. Each of these amplifier modules contributes to a system of combiners which then add the amplifier's power together and direct it to the transmitter's final output connector.

Overwhelmingly, our problems have been with silicon devices known as MOSFETs or Metal Oxide Semiconductor Field Effect Transistors. These

are used for the final amplification stages of each module and for modulators in AM transmitters.

Failures run the gamut from weak output of the device to physical destruction. Normally, the MOSFETs alone can be changed or maybe some upstream components might be damaged like a resistor or a fuse. The modules are generally field repairable, and on one FM transmitter, I've repaired more than I can count. Pop the module out, fix it, pop it back in (they almost always slide out in some way), and Bob's your uncle.

Recent failures on some of our other transmitters have required full module replacement, despite my attempts at troubleshooting. In one case, the troubleshooting information provided dead-ended with confirmation of what I already knew – that the module was bad. No mention of what to do about it.

I wager no one reading this will disagree that products of many kinds have become impossible to repair. When I was a teen, there wasn't much on a car that I couldn't fix. Sure, some things were beyond the capabilities of Dad's garage, but we could handle a great deal. I once changed out the transmission on my parent's motorhome and completed a frame-up restoration of a Jeep CJ with Dad's tools! Today, I'd be lucky to be able to establish if the transmission was even the real problem. Complexity is not necessarily our enemy, but it has taken the business of repair to a height many cannot reach.

Recently, bipartisan legislation has been making its way around state and federal government bodies to try and balance repairability and fairness to end users. Manufacturers' desire to force end users to use only their repair facilities, thereby protecting

their intellectual property and feeding repair and parts dollars into their own bank account.

This sword cuts both ways no matter how you look at it. Complex and delicate devices need to be serviced by highly trained individuals who can access parts and documentation, and if others are given documentation and access to repair their stuff, they risk losing control. Reverse engineered imitation products already threaten their business's reputation and profits.

These two things seem to contradict one another in a paradox that will continue as long as humankind progresses technologically. Hopefully lawmakers can help ensure access to parts and repair information to trustworthy second tier establishments, so consumers have a choice of more than the product's original maker.

Three-Year Battle Fought; Victory Won!

WMUZ-AM, our 50 kW ten (!!) tower AM in southeastern Michigan, is a blowtorch! I've gotten DXer reports from as far as Finland more than a few times.

Having ten towers with two patterns and power levels requires that the site must switch both at dawn and at dusk at the FCC stipulated times. For those not familiar with AM directional arrays, there are relays, contactors, inductors and capacitors at the base of each tower, either in small buildings called tuning houses or in weatherproof cabinets that we call ATUs (Antenna Tuning Units). ATUs are smaller metal enclosures which house the same components as a tuning house but have fewer mice.

When I first took on the responsibility of this 50 kW radio station, I had spent a lot of time troubleshooting faults related to the daytime/nighttime switchover. I found lots of things would fail intermittently (why make it easy?), obfuscating the faulty components. Usually I would find misaligned microswitches, but I also found bad microswitches, loose microswitches, physically impeded contactor mechanisms, and weak relays.

In the ATUs, microswitches function to confirm the physical position of the contactor. This is a report back to the controller in the transmitter building that switching event is complete and that everything is in the correct position for the intended pattern and proper loading will be presented to the transmitter.

At a site with ten towers, there are ten ATUs, each with switching components. Switching cannot be performed while transmitting, so if any ATU fails to switch, fails to switch completely, or fails to properly read the switching component's

position, the transmitter will be held with its RF output muted, and thus the radio station stays off the air.

Because of this, I have our site remote control systems set up to report any protraction of the pattern change. Should the change not complete, the system will repeat the process a few times and alert me that it had to do so. If I have to intervene, I have a security camera focused on the control rack so I can remotely view its 48 (!!!) status indicators.

After adjusting or replacing microswitches, changing a couple of coils on contactors, and lots of cleaning, I started checking relays since I had witnessed some that were slow to pull in. These are 24V relays, and I observed that our unregulated power supply was supplying only around 21V. I looked up the relays' specification, which told me that they should reliably pull in at 19V.

Given the length of wire running to the towers, I felt that 21V was far too close to the relays' spec, so I replaced the controller's power supply

with a regulated unit. Unfortunately, the simultaneous switching of ten towers caused it to crowbar. The crowbar is a common built-in shutdown feature to protect a power supply from feeding a short circuit or a load in excess of its capacity. I ordered a heavier duty regulated supply, and having a steady, solid 24V source seemed to quash the slow pull-in issue. That was three years ago.

Recently though, the interlock for tower ten started failing to report a completion of the switch position to the daytime mode. Again, I studied the schematic and checked every component of tower 10's ATU, starting with the things I'd found were wrong before. Nothing was obvious. I then measured the voltage coming back from the ATU and found that the relay inside the controller was getting only 16.7V back from the ATU and thus was unable to pull in reliably. To mitigate this, I raised the new regulated supply up to just below 26V, which got the relay working reliably again – for a time – but I knew something was still out of whack.

After about a week of switching failures happening almost every day, I had to figure out what was causing this trouble. In no way should there be 9+ volts dropped across the loop of wire going to



The panel where the control wiring leaves the building.

tower 10 and coming back to the controller. I started measuring voltage wherever I could, and I finally found a bad physical connection where the control wiring leaves the building. I could measure approximately 9V between the wire and the terminal block. Moving the wire slightly wiped out almost all the voltage drop. Opening the screw on the terminal

the block, pushing the wire in further and retightening fixed the issue entirely.

I tell this story in detail to illustrate how something simple can confuse the thought process. After having made several other corrections to a given system, the mind sees two issues with the same symptom and wants very badly to apply the same fix.

News from the South

by

Todd Dixon, CBRE
Chief Engineer, CBC–Alabama

Natural Recipes...for Disaster

At one point in my career as Stephen Poole's assistant engineer, I guess it had crossed my mind a time or two, "Man, he sure does include the weather in his monthly *Local Oscillator* article a lot!" Really, it wasn't that I was naive to what the weather had wrought in the previous month that would cause us to have to run around and fix issues at our sites – I had been a part of the experience. The reason for all the talk about the weather, particularly in this column, is relatively obvious: we live in Satan's weather playground here in the south.

On Wednesday the 8th of



Figure 1 - Red lines indicate where trees were down and green lines indicate breaks in the utility power lines. Our site is in the upper right corner of the image.

and killed the network port it resided in. We ended up being able to switch to an empty working port in the switch and continue the mission.



August, a dense storm traversed our Red Mountain tower site that carried some intense electrical activity. Our Cisco network switch that we had just installed in June took a hit from a nearby lightning strike through our Cambium radio CAT5 cable

Before we had time to even evaluate and get any extra lightning suppression in place, we had another similar storm on the 10th. I say similar, but

this storm had the additional fun of carrying a high wind gut punch at Birmingham's Red Mountain Park, where our site resides. Our Red Mountain site is our STL nexus, and we send audio to every other site from there.

This time, we lost the network switch port again, along with six ports. WDJC-FM was on, but no other sites were receiving audio. I swung by our studios and picked up our spare switch and began to head to the site.

The embedded Google Maps snapshot shows my problem. I couldn't get to the site from any accessible road as trees and power lines had been down over all three ways to access our site.

I went back to our studios and monitored the Alabama Power outage map. At 2 a.m., I decided to get some rest and set my phone alarm for every 30 minutes so I could wake up and check their progress on clearing the wreckage. At around 4:30 a.m., they had significantly knocked down the customer outage totals in the area which meant they had cleared the downed trees. After getting audio back to all of our sites around 5, power still wasn't restored, but the generator was holding steady. I headed home and got some sleep.

Saturday afternoon, our Cullman site was pinging me via PRTG that the last leg of our 6 GHz Dragonwave link was down. I went and checked my radio and sure enough we were off air. I called and asked Stephen to check it out as I am nearly 85 miles away from the site at my home and he is about 25 miles away at his home. He obliged and when he got

there, his assessment was that our generator transfer switch was the problem. We had all three phases of utility power, and the generator had no problem starting, yet there was just no power was emanating from the panel.

Our generator service person only lives about 20 minutes from that site and he's a listener to the station! So he got there in pretty short order and the transfer switch had put itself in "emergency" position. As Stephen said in text, "Perry glared at it hard and it got its mind right." They also couldn't regenerate the issue, as they transferred power back and forth between utility and generator power at will.

Back at my cabin at Red Mountain, the power company gave a utility restore ETA of around 6 p.m., then 8 p.m., and finally 10 p.m., I told my wife after the last extension that I better get up there and check the generator fuel and replenish what I could with several jerry cans that we have at the site. As it almost always happens, when I got the last drop of fuel out of the last can I had, utility power was restored, and we had 20 extra gallons of fuel in the tank.

Over the course of the last couple of weeks in August, we've gotten our generators fueled back up, gotten both of them serviced and addressed our lightning suppression.

The timing is good because as most of you have likely seen, our attention now needs to turn to the Gulf of Mexico and the major storms that dance around out there. While Idalia doesn't look like its trajectory is heading our way, its inevitably going to landfall somewhere so be praying for those that are in its path. Only three years ago, my mom (who lives in Panama City, FL) survived Hurricane Michael, which went from a category 2 storm to 1 mph wind speed short of a Category 5 over a period of just 24 hours.

Always Trying to Engineer Better

One of the things that the second storm exposed was that our backup audio STL paths had failed at Red Mountain in that storm. They hadn't dropped in the first storm only two days earlier, so we were stumped about why it had happened (or didn't happen as it were). Jack and I sat down and evaluated what we had to work with, both at the tower site and the studio, and came up with a pretty good plan. We decided to use a Wheatnet Digital I/O blade that wasn't being used with our system at the studio and use it in a stand-alone, non-networked mode at our Red Mountain tower site.



Figure 2 - The Wheatnet blade silence sense logic allows the digital audio to continue to flow in whatever equipment condition we encounter.

You might be head scratching, how did that help you at all? Jack programmed it up so that when, if, next time our Cambium networked APT and Tieline codecs are down due to the a loss of network, we still will have our Moseley Starlink 900 MHz audio (usin4g some Kramer Analog to Digital converters we had on site) to continue to pass out AES audio to the rest of our stations via the silence sensor logic on each channel of the Wheatnet Blade.

Looking back at what this weather always teaches me, we need to strive to make our systems more bulletproof than they were before and to keep on top of the efforts we've put forth previously.

Blessings to all of you and we'll visit again next month.

Tales From Cousin IT

by

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

People sometimes ask me why I left North Carolina and moved to Alabama. NC has a lot of good radio, but many of these stations – especially in the smaller markets – are run by some very stingy people. I often joked that one guy for whom I did contract work had decorated his home with really thin, beautiful copper plates. The only thing that marred the effect was that you could still make out the faint outlines of Lincoln's head. Getting money out of these people required skill and patience.

Then there was the guy who had an ancient RCA BTA5. I can't remember the precise model; it was one of those that was full of synchromotors to angle-fire thyratrons to control the high voltage. Rube Goldberg must've been moist-eyed when that thing was introduced. The only good thing I can say about it is that at least it wasn't an Ampliphase™ (trademarked and capitalized out of irreverence – if you aren't familiar with the Ampliphase™, well, consider yourself blessed).

One day the RCA tripped its main breaker on the wall and went dark. The transmitter was behind a big glass window just off the control room. The HV transformer was mounted in a small shed outside, behind the building. A familiar odor greeted me when I walked in, and a meter soon confirmed what I suspected: the HV transformer had a complete primary-to-secondary short. One of the deejays had noted that the florescent lights had gotten really, really bright for a moment before the breaker tripped. (Heh).

The station was owned by a fellow from New York. His mother apparently had plenty of money and bought the joint just to give Junior something to do. His knowledge of the radio bid'ness could have been carved into the head of a small pin with a hammer, but hey; at least he paid my bills, if slowly. When I called to tell him that a new transformer would cost several thousand dollars, his response is still ringing in my ears: "Oh, Steef! OHHH, STEEF! I'll have to call Mother!"

This was my first experience with reverse-wiring utility transformers ("pole pigs") to get back on air. I connected the 240 3-phase to what would

normally be the secondary and managed to get several thousand volts into the transmitter. For my money, it actually worked better than the

synchromotor/thyratron/alien-technology-from-Area 51 stuff, but eventually, the new transformer arrived and I installed it inside, in a new frame surrounded by chicken wire. Ugly as sin, but it worked.

So ... don't wonder why I thanked God and jumped at the chance to work for Mr. Crawford and the Crawford Broadcasting Company when Cris offered me the position. (If I was a Roman Catholic, I'd have been sorely tempted to light a candle to St. Dismas.) I haven't looked back since.

Windows, OH Windows

You should be warned: I'm in a gnarly mood. My submission for this month's *Local Oscillator* was delayed by my HP music workstation. It wanted to install something called the "Omen System Optimizer" (Figure 1). I kept telling it no, but the pop-up reappeared again after a short while. Repeatedly. Multiple Google searches showed that it could be disabled or uninstalled, but it hadn't even been installed yet!

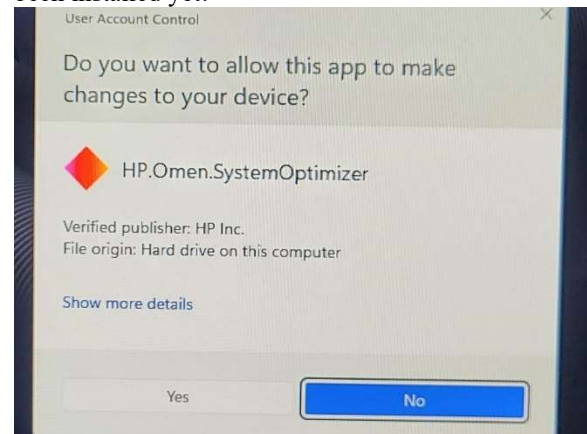


Figure 1 - Had to take a 'screenshot' with my phone ...

Todd and Jack could provide all sorts of horror stories about Life with Windows. Microsoft's never-ending attempts to further monetize their

already-ludicrously-successful operating system have moved into the "something worse than silly" category. Pop-up ads, repeated requests to subscribe to something, and worse. If it happens to prevent you from doing useful work (or better in our case, knock you off the air), well hah, hah! Just kidding. We're still friends, right?

HP (nee Compaq), which I used to consider one of the best computer makers, has become just as aggressive at installing what the geeks call "bloatware" – unneeded and unnecessary software that you'll never use, but that constantly begs for attention. (We'll leave aside their multi-function devices that won't scan or fax if you happen to run out of ink. On August 10, a federal judge ruled that HP must face a class-action suit on that one, by the way.)

Finding and uninstalling bloatware is time-consuming and frustrating. Here's the truly happy-making thing: I looked in the task scheduler, the startup program list, and every other place I could think of for this "Optimizer" thing, and... nothing. I finally had the presence of mind to click the "More Details" button on the pop-up window.

I couldn't take a screenshot; it was a modal dialog that took over the display. I had to actually grab a photo with my smartphone. But the "details" button located the file (which, mind you, had been downloaded completely without my knowledge or consent), which I promptly deleted. So far, so good ... at least until HP decides that it really, really wants to install it again.

When you add in the fact that all operating systems, including the one on my Android smartphone, want to "optimize" everything after each update, well, it's no wonder that my hair is gray. These "optimizations" will often reset stuff that you changed to make the phone less annoying and more useful. So, off you go into Settings Land to redo all of your work. It's a beautiful thing.

I understand that Windows Pro versions are a bit better than the Home releases about this kind of thing, but we still run across computers that will come down with a severe case of weird from time to time. Digging through the system settings, you'll often find some tweak or adjustment that Windows has changed – strictly for your benefit, of course.

Generator Fun at 101

We continue to have severe storms from time to time. This latest batch has been very slow moving, dumping megatons of water on Planet Erff and knocking out the power kind of at random. Both WDJC and WXJC-FM lost power at the same time

on August 12, so Todd called and asked if I'd go look at the latter in Good Hope, AL. I was glad to.

WDJC's generator had cranked and it was on air, but 101's generator was idle. We were dark and silent. I knew we had a fundamental power problem as soon as I crested the rise a few miles from the site; the tower wasn't blinking. Oh, boy. When I arrived, I started troubleshooting.

Cullman EMC's (the electric utility co-op) meter showed that we had all three phases. I was able to manually start the generator, but it wouldn't transfer. Because my brain is as thick as notebook paper, I had left my multimeter on the kitchen table at my house. I ran to Lowe's and bought one for the site (we had one there, but it had died; I like to keep one at each site, along with basic tools). It showed a good 240V 3-phase, leg-to-leg, passing through the main disconnect into the building (Figure 2).



Figure 2 - Utility power enters the building at 101 through this breaker box.

Todd called our generator guru, a guy named Perry, and he came right over. He opened up the transfer switch and toggled some things; this time, when I started the generator, it immediately transferred and we were back on air! I wanted Perry to show me the magic wiggle and toggle that he'd used to make this happen, but he shrugged and said he'd just poked around. He must be a good poker.

POR System

The actual idea and inspiration for our online POR system came from Cris Alexander. I've

been tinkering with it for over a year now, and am still amazed at how popular it has become. There are still a few bugs to slaughter and some features to be added (such as archiving and search, at least at the corporate level, to make the listing more manageable). But God has been good, and the system works!

We're pondering some other things that might be moved online. I'll write about that in a

future issue, Lord willing. I also still plan to do an in-depth look at troubleshooting irritations like my aforementioned pop-up problem, but to be honest, I was just too discombobulated (and behind schedule), thanks to the very problem in question.

But remember, computers make our lives happier and more productive. I keep telling myself this, anyway.

Until next time, keep praying for this nation!

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

One of the toughest challenges I face in getting things moving along and finishing projects is working with vendors and/or those service companies. Often it feels like so much is beyond my control and is in the hands of people who are facing their own challenges. I am not deaf to the fact that many of our vendors and those in the contracting business face supply chain issues. Still, there have been times where I wonder why it is so hard to spend money with some businesses?

In the past month or so, this has been brought into clear focus with the installation of the new generator at our Burnham transmitter site. First off, just waiting for the generator to arrive after placing the order for it in late 2021 was a lesson in the new world in which we live. We did not receive delivery of the generator until May of this year.

We hired an electrical contractor to take the lead in the installation. There are challenges getting into this site physically as the roads into the site are not ideal. This means a crane that has the capability to basically go off road. It also includes a mechanical contractor and a concrete company to break down the current concrete pad and rebuild it so the electrical plumbing can be changed.

Earlier this month, the concrete work was finished, and the generator swap was scheduled to take place over a three-day period to minimize the length of time the site would be without a generator. This was something I really appreciated about our electrical contractor. They understood the need for the radio station to have the smallest amount of time without a generator.

The three-day swap was scheduled with all the crews lined up to do their parts. Then the rain hit the night before and it was deemed that the road was probably going to be too soft for some of the heavy equipment that had to get the site. So, the work was rescheduled for the following week.

During this time, it just so happened that the generator company had a tech performing preventative maintenance work on our studio generator. I brought up the topic of the new generator installation at the Burnham site. He was very familiar with our setup there and asked if they had sent a generator that used liquid propane for fuel. I wasn't sure but invited him to take a short trip to check it out and see if it was correct.

Upon inspecting the new generator, he told me that this was a good news/bad news situation. The bad news was it was not set up for liquid propane. The good news was that we had caught it in time before the old generator was decommissioned.

From that point we had two choices: order the kit from Cummins to convert the new generator to liquid propane, or see if the propane supplier could send vapor instead of liquid from the tank to the new generator. We were told that it was a four to six week wait on the conversion kit.

Given that time frame and the fact that we all felt the generator would perform (and certainly start) better with vapor, the choice was obvious. However, we had to confirm that with our propane supplier. This should have been a five-minute phone call or at worse a tech from their company looking at the tank.



However, even when calling the local number, you end up with the automated menu, and then once you talk with someone, that is at a national level with a call center person. They didn't really know their product. The best they could offer me was to have someone do a tank inspection. I went ahead and had this scheduled with a very open-ended appointment. So open-ended that they didn't show up on the day they said they would.

I called back, jumping through the hoops only to find they said it was really for that afternoon. We then went to the site at about 11 am, just to make sure we weren't getting any time zone confusion, only to find that the tech had already been out to do the tank inspection. Great! We had a tank inspection, but I didn't get to talk to anybody about my real question!

So again, jumping through the hoops on the phone, I finally got to a supervisor. He at least understood my question. He told me that he would call back in a few hours.

Surprisingly, that didn't happen. I was waiting for the call. I got tired of waiting and decided to go park myself at the local office, even though their website stated, "No Walk-Ins." I pounded on several doors and finally decided to wait in my car because sooner or later someone would walk out the door.

Eventually, a lady with her dog came out of

the office. I explained who I was and my issue. She told me that the tech was on the schedule for the next day. Of course, no one had bothered to tell me that.

The next day was the hottest day of the year, and we couldn't get back to the site due to work on railroad crossings. I got my cooler full of water and waited at the tracks.

After a while, the tech called me, and he was able to answer my question to the affirmative. A five-minute call was all that was needed, but unfortunately, it had drug out to almost ten days!

Who's at fault for this kind of service? Probably hard to blame anyone. They're doing their jobs, but this company and many others like it need to figure out how to be more flexible when a question arises that they don't normally deal with on a daily basis. I would also say that while they are understandably protecting the time of the understaffed local employees, they should not make it impossible to contact the local staff and especially their knowledgeable techs who work in the field.

At the time of this writing, we now have the direction we are going, but there are some parts that will still be needed, namely regulators to reduce the vapor pressure to proper levels. I am hoping that a month from now I am not writing about us still being in a holding pattern and that the project that was supposed to take place in 2022 is still not finished by start of the fourth quarter of 2023.

Valley News
By
Steve Minshall
Chief Engineer, KCBC -- Modesto

The end of last month, we had to re-position our KU band satellite dish from SES-3 to SES-1. The move wasn't huge as SES-3 is at 103°W and SES-1 is at 101°W.

Everyone has their own way of accomplishing the aiming of satellite antennas, and I will describe the procedures I used here.

I find it best to make preparations in advance of the actual move date. These include getting the appropriate wrenches, an AC power extension cord for the spectrum analyzer, RF cables and adaptors, the appropriate power-pass/block L-band splitter, spraying the bolts with WD-40, and checking for any new wasp nests.

Another preparation to be done is finding a way to determine a way set the new azimuth and elevation angles.



Using an on-line calculator, I found that the difference in the antenna azimuth angle for SES-1 and SES-3 is 2.9 degrees at our location. The difference in elevation is 0.9 degrees. I found the circumference of the antenna mount to be 14.7 inches. Dividing this by 360 gives a result of .0408 inches per degree. Rotating the mount by 0.118 inches on the surface would result in the required azimuth change of 2.9 degrees.

I prepared a piece of masking tape with two lines spaced 0.118 inches apart and put it on the antenna mount. I used a magnetic mount for dial indicator to hold a bolt with a sharpened 1/16 rod to use as a pointer. The rod was positioned directly over one of the lines and then the antenna was rotated until the second line was directly under the pointer.



My reference marks and pointer for rotating the antenna to the new azimuth.

As I rotated the antenna to the new position, I was watching the spectrum analyzer. I could see the signal from the old satellite fade out and signals

from the new satellite were evident at the new position.

By adjusting the elevation down a bit, the new transponder signal was peaked. I was prepared to use an automotive camber bubble level to adjust the elevation, but that was not needed.

Finally, I rotated the LNB and feed horn for the cleanest spectrum, but as luck would have it, that was the wrong polarity and I had to do a readjustment the next day.

My procedure may be deemed overkill for such a small move, but it almost guarantees quick success. The actual time to move and peak the signal on the new satellite was just a matter of minutes.

Like a lot of things, the majority of the time spent on the project was the preparation and clean-up. I did the move at dusk so that I could clearly see the spectrum analyzer display. I was glad to be able to get it done quickly before the mosquitos came out in force.

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

August is typically a slower month for me. I have a full week off work, and it's typically too hot for any outside work.

Our weeklong vacation at the beginning of August was wonderful. We go to the mountains nearly every weekend once the weather is warm enough and it's great. It's nice to have that time away each week to recharge. But going down to the San Juan Mountains for a week is something else. I can't even describe just how beautiful it is down there. I'm not saying that what I see each week isn't beautiful, I'm saying it's a different beautiful. We had a fun week of fishing and relaxing. My husband and I even took his 2016 Tacoma and did the Alpine Loop 4x4 trail with a stop in Silverton, CO. It was a fun day, and something we hadn't done in the truck before.

Voicemail Woes

Getting back to work after a week off is always difficult. Thankfully I didn't have any big

fires to put out until the end of the week. I noticed that our phone system wasn't emailing voicemails anymore. This seems to be a problem we have once or twice a year.

I began troubleshooting, and on a Friday no less, made the decision to reboot the system. When I did this, the voicemail system did not come back up. I got tech support on it, and they couldn't do anything either. They made a bootable USB for me to use, and after several failed attempts to reload the operating system, I gave up for the day.

On Monday we hit it again. The issue was they were having me put the wrong version on. Once they figured that out, it all worked.

The only downside to having to do this was that all the greeting recordings were gone. I'm not talking about voicemails, which were also gone, but the greetings for the main system and every individual greeting. I had one of our newer guys do some recordings for the system and walked everyone else through doing their own greeting again.



I gave it several days and then backed the system up. I think I did it correctly, although I'm still waiting for tech support to confirm if the recordings will be in that backup. We did have a backup before; it just didn't have the recordings. I'm hoping to prevent this from happening again in the future.

Tower Lights

My husband texted me one morning on the way to work asking about our towers on County Road 6. This would be the KLVZ day towers. He noticed the tower lights on one were off and the other two were on but not flashing. It was bright enough that the one tower had turned off, but the other two remained on. It was too late to head out to investigate so I waited until sunset and went back out.

Sure enough, the two were not flashing. I immediately called in a NOTAM on the two towers. I have confirmed the photocell is working (obviously if the lights are coming on). Next, I replaced the solid-state flashers, which thankfully I had. It's weird that both flashers went out at the same time, but I guess I have seen weirder things.

Inventory

It's that time of year again. All my fellow Crawford engineers know the pain of having to go through and make sure everything is where it is. It's a time to make any changes that weren't caught, a time to sticker any equipment that isn't already tagged, and a time to remove old equipment that is no longer with us.

In Denver, over the last several years, we have been cleaning house, mainly at the KLZ site where all of our extra equipment for the whole company is stored. By doing this and getting rid of obsolete equipment, it is making it easier to get inventory done. I finished mine in a matter of days when it would normally take me a couple weeks.

It also helps that I'm based in Denver and have access to that master inventory database. This year I made it a point to do any updates in there throughout the year as changes, additions and deletions occurred. I still missed a bit, but it has

helped.

With inventory time here, it also means budget season. It's time to start thinking about major items like tower paint, A/C replacements, transmitter, generator and other big-ticket items that may be needed. I am already working on getting bids for some items. I got on it early knowing it would take months to get the info I needed.

Society of Broadcast Engineers

Is it crazy that we are beginning to think ahead to 2024? It is crazy. As chairman of the local SBE chapter, I realized I need to start thinking about getting some presenters on the calendar. I had 2023 planned and booked by the beginning of summer. I hope I can do the same for next year.

I say this at least once a year: if you are a radio or TV engineer, find a local chapter to join. Many chapters put on informative meetings, plus have various social gatherings throughout the year. I try to have Zoom going for our in-person meetings that happen in the big conference/classroom in this building. This allows anyone to join us. Sure they miss out on some good food, but at least they can take credit for the meeting and maybe even learn something.

The national SBE organization puts together numerous webinars throughout the year. If you have the MembersPlus membership, those webinars are free (as are the SBE Online University courses). The education you can get through the SBE is priceless. You can get info on joining the SBE and find a local chapter at sbe.org.

Looking Ahead

As I look ahead to the autumn months, I still have tons of work to do. The growth at the KLTT and KLVZ transmitter sites has skyrocketed due to all the rain. My hope is that the sun will dry it all out, and that when fall does get here with all the wind it usually brings, much of it will disappear. The rest I will mow with the tractor. I really would like to get things knocked down and looking good again, making access to the sites easier.

I pray you all stay safe and well.

The Local Oscillator
September 2023

KBRT • Costa Mesa - Los Angeles, CA
740 kHz/100.7 MHz, 50 kW-D/0.2 kW-N, DA-1

KNSN • San Diego, CA
1240 kHz/103.3 MHz, 550W-U

KCBC • Manteca - San Francisco, CA
770 kHz/94.7 MHz, 50 kW-D/4.3 kW-N, DA-2

KLZ • Denver, CO
560 kHz/100.3 MHz, 5 kW-U, DA-1

KLDC • Brighton - Denver, CO
1220 kHz, 660 W-D/11 W-N, ND

KLTT • Commerce City - Denver, CO
670 kHz/95.1 MHz, 50 kW-D/1.4 kW-N, DA-2

KLVZ • Denver, CO
810 kHz/94.3 MHz/95.3 MHz, 2.2 kW-D/430 W-N, DA-2

WDCX • Rochester, NY
990 kHz/107.1 MHz, 5 kW-D/2.5 kW-N, DA-2

WDCX-FM • Buffalo, NY
99.5 MHz, 110 kW/195m AAT

WDCZ • Buffalo, NY
950 kHz/94.1 MHz, 5 kW-U, DA-1

WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT

WCHB • Royal Oak - Detroit, MI
1340 kHz/96.7 MHz, 1 kW-U, DA-D

WRDT • Monroe - Detroit, MI
560 kHz/107.1 MHz, 500 W-D/14 W-N, DA-D

WMUZ-FM • Detroit, MI
103.5 MHz, 50 kW/150m AAT

WMUZ • Taylor - Detroit, MI
1200 kHz, 50 kW-D/15 kW-N, DA-2

WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT

WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT

WYRB • Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT

WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT

WYDE • Birmingham, AL
1260 kHz/95.3 MHz, 5 kW-D/41W-N, ND

WYDE-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

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

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



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