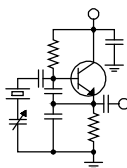


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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It was the best of times, it was the worst of times. No, we're not doing a reading of *A Tale of Two Cities* here. It's more like *A Tale of Two Tower Sites*.

As we rolled into June, we had completed most of the Zetta conversion company-wide. Chicago's conversion, the last for our company, was underway and we were very much looking forward to wrapping up that six-month project. So far at that point, things had gone fairly well, and all across our company, people were really learning to use the new platform. It was a good time for us.

But then... it was like Job chapter 1. The bad news started coming in, and it kept coming in waves. I really did feel a bit like Job.

First, Brian Cunningham gave me the news that he is retiring at the end of July. Wow. I didn't see that coming, at least not in the near term. More on that later.

Then what was initially believed to be a transmitter issue at the WXJC-FM site in Birmingham turned out to be failures in both the main and auxiliary antenna systems, both 1,200+ feet in the air and about as hard to work on as it gets. The station was off the air and would stay off until we could get a replacement main antenna. More on that later, too.

And then... I got a call from Mike Kernan telling me that the guy who cuts the grass at the WRDT transmitter site had somehow snagged a guy wire for a tower and the tower was on the ground. Holy smoke! Thankfully no one was hurt, but that station was off the air, too.

All this started to feel like a spiritual attack, and maybe it was. I was reeling, and for good reason. It's tough enough to deal with one major issue, but three at once? I've never had that happen before.

I will let Todd and Mike give you their perspectives on their respective issues, and Brian has something to say as well. Here's my perspective...

WRDT Tower Collapse

As I have thought through disaster planning over the years, a tower collapse is always a headline event. What would we do? How could we get back on the air? How long would it take to get a replacement tower? What factors do we need to consider? How much would it all cost?

All those questions play into our insurance coverage and our disaster recovery plan. From an insurance perspective, not only do we have the casualty of the tower/antenna loss, but we also have to think about business loss and how much/how long. That only

takes care of the instant loss, not long-term losses that can result if clients pull the plug on their contracts during the outage.

This tower collapse is providing a real-life fire drill of sorts on the plan for this particular station, and it will likely serve as a template of sorts for other stations as well. When we're all done, we will have a much better idea of all the aspects of a collapsed tower replacement, some of which I had never considered before.

For example, the model I have always employed assumes that the tower



Tower #4 at the WRDT day site. Towers do not belong in the dirt.

foundations/anchors will survive and be usable by the new tower. That's not an unreasonable assumption, but the WRDT tower collapse resulted in significant damage to several of the guy anchors. At one of the anchors, the steel of the I-bar was wrenched around 180 degrees from its normal orientation! Even if we could heat that up and straighten it back out, the steel would be weakened and we couldn't trust it.



Bay #3 of the WXJC-FM SHPX-8AC. There are holes in several bays but #3 looks to be the worst, with several linear burns that opened the antenna to the elements.

Since several of the anchors had similar damage, it quickly became clear that we would have to replace all the guy anchors. While we could excavate and demolish the damaged anchors and install new anchors in their places, the cost to do the demo would exceed the cost to simply excavate, form, pour and backfill six new anchors clockwise a few degrees from the old anchors. So going forward, I will have to revise my plans and insurance coverage to include new anchors.

Thankfully the base pier was not damaged other than cosmetically, so we don't have to mess with that. If it had to be replaced, we would have no choice but to excavate and jackhammer, and that's no small block of concrete.

In the how-long department, you may recall that WRDT has a low-power non-directional night authorization on a 992-foot tower off of 8-Mile Road in Ferndale, Michigan. That tower was, when the night facility was built by Greater Media, owned by that company. They put a wire skirt on it and tuned it for a match on 560 kHz and installed a de minimis ground system. The result: amazingly good night coverage of Detroit by the station.

When the tower collapsed, we immediately switched to the night site at 14 watts to get something – anything – back on the air. I recalled that §73.1680 allows for emergency antenna operation with 25% of

the nominal authorized power. I filed an STA request for 125 watts (25% of the authorized 500 watts daytime power) using the night antenna system, and the FCC immediately granted it, bless their hearts!

125 watts doesn't sound like much, but stuff that power into a 203.4-degree vertical radiator right in the middle of the populace you need to cover and it will do the job! I mapped the coverage and found that the 125-watt non-directional 2 mV/m (metro grade) contour would encompass 97% of the population within the licensed daytime 2 mV/m contour. We can live with that for a while, and it really takes the pressure off, buying us time to deal with the downed tower.

Precedent to replacing the anchors, I had to get a set of borings made to determine the composition of the soil for the new anchor design. At this writing, that has been done and we are awaiting the completed engineering on the new tower.

At this point, next on the agenda is getting the site cleaned up of the twisted mess of the old tower, pulling a building permit from the city, and ordering the tower steel once the permit is in hand. We have already ordered the new base insulator and Austin ring transformer plus the static dissipation array for the tower top. I hope to have the new tower up by the middle of August. We also have to repair the smashed fence and tuning house roof. And of course, I will have to run a new moment-method proof.

WXJC-FM Antennas

As I write this on a Friday, an installation crew from ERI is scheduled to be at the WXJC-FM site on Monday. The plan is to rig the tower and take the damaged SHPX-8AC down on Monday, then take delivery of the new SHPX-8AC on Tuesday and start putting Humpty Dumpty together again. Weather is always iffy in northern Alabama this time of year, so we'll see how that plan holds together.

So how did we get here, with WXJC-FM completely off the air? Some of the answer is clear and some remains a mystery. The clear part is that we took one or more lightning hits on the main antenna, which opened the interior up to the atmosphere. Todd and Jack were unaware of that until they started getting VSWR trips on the transmitter a couple of weeks after the storm that likely did the initial damage. By that time, there was probably a good amount of water in the antenna, and it was arcing internally. The arc locations are readily visible on the outside of the antenna.

But what about the auxiliary antenna? Why couldn't we simply switch to that? Well, we tried...

and had very high reflected power. We sent the drone up the tower and saw what appeared to be a meltdown at the power divider



Discoloration indicating interior arcs are visible in several locations, including here, right at the input.

tee. It appeared to be open to the outside world, like a plasma arc developed right in that tee and vaporized some of the brass of the tee. What's more perplexing is that the outside of that tee appears to be covered in some kind of bituminous material that is mostly melted. Where did that come from? I'm guessing that at some point in the past, likely before we purchased the station, there was a leak in that line and the tower crew "fixed" it by wrapping the tee in some kind of rubberized material, like Coax-Seal tape or whatever. How no one ever picked up on that is a mystery to me.

It's our hope that we will find the damage to the aux system is limited to that power divider and maybe the horizontal and interbay pieces of line that connect to it. I don't see discoloration anywhere else on the antenna, but then again, the bays are inside radomes. We have a new tee on hand and ready to go up, and we have line pieces and field flanges that we can solder on to replace any damaged line sections.

We also have on hand half a dozen bottles of nitrogen. Each bottle will displace all the air inside one of the lines 1.3 times, so if we run three bottles through each line we will have completely purged each four times. It remains to be seen at this point whether we have any significant amounts of water in the transmission lines, so we may have to adjust that plan.



Aux antenna power divider tee. I have no explanation...

Brian Cunningham's Retirement

All things considered, I'd rather deal with a tower in the dirt and a pair of burned-out FM antennas than have to replace one of our most experienced and valued chief engineers.

Brian has been with us in a full-time capacity just short of 23 years and was around, taking care of WDCX-FM for years prior to his full-time start while he was working for contract engineering firm S&B Communications. His fingerprints are all over every part of our Buffalo technical operation. The new studios and all our transmitter plants were, at least in part, his creations.

Every trip I have made to the market over the past two decades has found everything shipshape, evidence of the great care and pride that Brian takes in his work. When there was a problem, and especially off-air emergencies, there is no one better at thinking on his feet and solving problems than Brian. I would invariably hear about the issue after Brian had already solved it or at least had the affected station back on the air.

It will be easier to fix our two current catastrophic failures than to replace Brian. I have cast a net far and wide, and we do have some applicants at whom we are looking. Whatever we do by way of replacement, it has to be right for our critically important Buffalo-Rochester market. Help me spread the word. I am looking for referrals and recommendations.

Brian, we wish you the very best in retirement. Thank you for two great decades of exemplary service!

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

Hello to all from Western New York! This year the official start of summer (at least calendar wise) began on June 20th, although we here in Western New York apparently did not get the memo.

The month of June has been unseasonably hot (at least by New York standards) with temperatures hovering near the 90-degree mark with oppressive humidity levels. As compared to other areas of the south and Midwest, temps in the upper eighties to near ninety compares to a spring day, but we are not geared for heat, and function poorly when the thermometer goes northward.

Along with the heat in June came the pop-up thunderstorms that seem to accompany the hot dry air, storms that are loaded with lightning and torrential rain, the kind that falls several inches in what seems like a matter of minutes

We have been fortunate that we have not experienced any heat/storm related problems at any of our Western New York properties. The A/C units have been operating well at all our transmitter sites and have been able to keep our sites cool during the oppressive heat waves.

In Buffalo, we did experience a failure of the exhaust system for our Nautel NV-40 transmitter in Boston, NY, although this failure occurred in mid-May. I solicited bids from several HVAC contractors to replace the problematic belt-driven exhaust fan, but bids were close to \$5,000.

Cris asked me to get at least one more bid to see if it was in line with the other two. After checking the BBB for recommendations, I chose Musso Plumbing and Heating to provide another bid, as they maintained a five-star rating. The technician came out and surveyed the exhaust system and came up with a quote on a direct-drive exhaust fan that was \$1,200 lower than the previous bids.

We are now waiting for the parts to come in and hopefully will have the work completed by the second week of July. Replacing this exhaust fan is

crucial to keeping the transmitter site cool, as it removes the heat generated by the Nautel transmitter, thus keeping the Bard wall-mounted A/C system from working so hard to keep the room cool.

In Buffalo, I have managed to keep ahead of the heat to assure that the transmitter sites are mowed and trimmed, although that is not the case at our Rochester transmitter site.

The spring rains have been unrelenting, causing wet/soggy field conditions, that combined with the heat have resulted in the grass growing rapidly. With the grass so high, it basically shields the wet ground from drying out, making mowing with the tractor nearly impossible. We have tried on several occasions to mow with our John Deere tractor and 15-foot batwing mower, but it got stuck in the mud each time. As of this writing, we have had several rain-free days with temperatures close to 90 with winds, so hopefully soon we can get the tower field cut for the summer

On June 28th, my wife and I celebrated a major milestone in our blessed relationship, our 50th wedding anniversary. I cannot safely say that I remember them all, but I can assure you that it went by so quickly, it's still hard to accept that so many revolutions around the sun have occurred since we said I DO. But I can assure you of this, I got the better end of the deal. She has had a lot to put up with over the years, mostly work-related issues, and through it all, has stood by my side without complaints.

As most of you are aware, I will be retiring at the end of July. It's not because I want to. I wanted to work for another five years or so, but recent health issues have greatly elevated the reasons to retire now.



I cannot complain, I have had the opportunity to do what I love for 56 years, and worked with some of the best people in the business. It's the relationships I have built with so many people over the years I will miss the most, and with God's grace, hopefully I will be around for a few more years.

So many of the people that I worked with when I started out in the late 60s have passed on, when I was the "young'un... Now I'm the "old guy" with a lot of stories to tell. This is not a final

goodbye, I will save that for next month's report, but I will say that it has been an absolute pleasure to get to know everyone associated with such a great company, and I am so grateful that CBC gave me the opportunity to join the organization back in 2003. My only hope is that I made them proud of my accomplishments.

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

And then there were three...

There was supposed to be very little for me to write about for this edition of *The Local Oscillator*, but alas, nature abhors a vacuum.

Early in the month, I headed down to our most distant transmitter site in Monroe, Michigan, home to our daytime signal for Crawford's WRDT 560AM four-tower array and 54 acres of farm field. I had been at our 1200AM site early in the day to meet with the generator technicians that were there to do a preventative maintenance visit. They didn't finish up until about 2 PM, but that left me enough time to load the John Deere on the trailer and tow it to Monroe, where we needed to do some spraying and mowing.

One of my other reasons for visiting the 560 site that day was that I had gotten some alarms that showed implausible numbers on our antenna monitor. Phases and ratios were all whackadoodle, and I was sure I was going to find a bad connection on one of the sample lines. I had hoped beyond hope that our farmer hadn't snagged one of the sample lines while disking the field for his annual soybean crop – a thought foreshadowing the real reason for the skewed readings.

I was teetering on hangry by the time I got to Monroe, so I stopped at a drive-through when my coworker Steve, who was already at the transmitter site, called frantically yelling into the phone, "The farmer knocked down tower 4!!" practically gasping for breath. He caught me off-guard while I was trying to pay for a sub sandwich – nothing could possibly be

more important than that sandwich, I thought. "I'm a mile away, I'll be right there."

As I passed through the neighborhood street adjacent to our site, I could clearly see only three of

our four towers. A pit formed in my stomach; what in the name of Sir Isaac Newton had happened? How are we going to stay on the air?

My suspicion that he'd snagged a wire was regrettably red hot. His disking attachment had taken hold of the northeastern outer guy anchor and rocked it 90° in its anchorage, breaking all four of the turnbuckles and instantaneously freeing tension on the four uppermost guy wires of the eight on the northeastern leg. A fatal blow.

The formerly 417-foot high tower 4 now lies twisted and folded back on itself. Part in the woods, part on the tuning house roof, and part in the south field where tower 1 still stands. Fortunately, it did not reach tower 1's outermost guy anchor-point, which could have caused a domino effect, bringing it to the ground, too. The considerable tension still on the remaining wires caused a whipping action which severely mangled the upper sections of the tower, throwing the top beacon fixture off its thick aluminum baseplate which cracked like it was eggshell.

Cris Alexander immediately contacted the FCC to request an STA (Special Temporary Authority) to operate WRDT exclusively from our nighttime site in Ferndale, Michigan. In less than 24 hours we had permission to operate there during the day pending our repairs in Monroe, and I



immediately adjusted our remote-control systems to ensure they would not alternate as usual between Monroe during the day and Ferndale at night. The FCC even granted us a temporary power increase to 25% of what our normal daytime power would be. This will do nicely until repairs can be made.

So, tower 4 is toasted, wrecked, scrap, kaput, canceled. We're having to order a completely new tower, which means a new ceramic base insulator, new lightning protection, new lighting, new guy wires, and new Austin ring, which is the free-air transformer to isolate the tower lighting circuit from the radio frequency excitation of the tower itself. We also need to construct six new anchor points, rotating them clockwise 20 feet each from the existing anchors, ensuring that no concealed damage could compromise the integrity of the new structure.

We anticipate being back on the air from this site late summer, early fall. A prerequisite to that will be a complete new Method of Moments proof.

I know very little about farming, but one ag statistic I can quote definitively is tractor 1, tower 0.

Zetta (the Wrap-Up)

Our conversion to Zetta is for all intents and purposes, complete. The folks using Zetta day-to-day

seem to love it. Our Operations Manager claims himself to be a Zetta pro and is in fact very proficient. Only a few weeks in and I don't get asked questions and for the most part, no one has any issues.

As there often are following big projects like this, a few things remained on the punch list. The one issue that was dogging me the most was related to the SQL database delivering records to our Sequencer 3 computer. For some reason we never nailed down why SQL records were arriving out of order to this sequencer. After several days this problem causes Sequencer 3 to fold its cards and leave the table. Audio would stop and control was impossible leaving two radio stations simultaneously off the air.

Knowing SQL is a memory hog, Cris and I decided to add another 32GB of RAM to the unit. So far, this seems to have fixed it (or maybe it just needed to be restarted, who can say for sure).

Zetta is a system designed to never operate without its central fileserver. Connection to the SQL server database is critical, so restarting the fileserver takes planning and RCS's support team on the phone. I decided to hang in until the memory upgrade arrived rather than coordinate a restart that may or may not have any effect. Then tower 4 fell.

News from the South

by

Todd Dixon, CBRE
Chief Engineer, CBC-Alabama

Antenna Issues

As I'm writing this, we've got a tower crew from ERI at the beginning stages of setting up for an antenna replacement on our WXJC-FM tower in Good Hope, AL. Its a 7-foot face beast of tower standing at around 1,380 feet in the air. We have a couple of bays of the antenna that took some pretty direct hits and opened it up to the "friendly" environment of the Alabama summer humidity. Obviously, that is not a good combination for a 100,000-watt FM station.

Alabama always has good storms to talk about. Generally, May and June are calmer regarding severe weather threats and real lightning producers, but not this year. As a measure, the 30-year average for rain in Cullman County for both months is around 9.52 inches. This year the total is

21.25 inches. While my wife loves that farmers in the area are having bumper crops of green beans, corn, tomatoes and butter beans, I get to watch and pray that the metal sticks I'm responsible for aren't getting hammered by the same storms that caused the crops to grow. Some might call that a beautiful dynamic, I've got other words for it...



The replacement antenna should arrive on June 30th. The crew expects to be rigged by the end of the day and they're working out the best placement for their winches and lines to run. Of course, we'll be dodging weather in the early part of the week and then we're supposed to be pretty rain free for the rest of the week.

The crew seems pretty dedicated to getting the work done on time with real professionalism. I'll report more on the replacement next month as I'm sure I'll have some stories to tell.



Bay #3 took the brunt of the damage.

The Zetta Database

Our transition to RCS Zetta has been relatively smooth with most of our Birmingham market doing really great and feeling like it has really modernized their work. Engineering-wise, we were having a running issue with the database hard drive constraints. Much like the rest of you, we have a primary and secondary database. The two 2-terabyte drives are set up in a RAID 0 (mirrored) configuration. This would allow for a drive to go bad on either file server and be replaced and rebuilt on the fly by the RAID controller. The drives were configured from the factory with two partitions, one 60 GB partition that houses the Windows Server OS, and another that has all of our audio data in about 1.8 TB of space. Unlike every other CBC market in the country, when Zetta was installed on our system, the installer placed the Microsoft SQL database on the OS drive. I'll let you guess if that was a problem or not.

What we ran into on several occasions was that some temporary files that are created and used by the database simply filled the tiny partition that the OS was on. Most of you have probably run into this before where you have filled a hard drive. The system simply has no room to do anything, and as hard as the CPU might try to move things around and survive, it cannot, and some really wacky things begin to happen. In our case, the Zetta license server said none of the workstation license could be validated and among other things, songs were starting and stopping in random intervals since the main file server wasn't exactly passing out database information to its constituent workstations in an orderly manner.



It took a dozer pulling a lift with another lift behind to get the mammoth winch up the hill to the WXJC-FM tower site. The ground was so wet the lifts could not move the winch by themselves.

A credit to the RCS support team, both times it happened, they were able to remove some of the cruft to get us back to working fairly quickly-with a stern warning that we should really increase the size of that OS partition. Yes sir, thank you sir.

The issue that I saw with that proclamation was that these were RAID drives, which means I would have had to go in and re-initialize the RAID configuration on the controller (removing all of the drive contents) and rebuild the RAID array so that it could handle the way the OS and database were configured. We'd have to be on one of the file servers while we worked on the first, and then once that work was completed with RCS fully involved, in the reinstall of Zetta, bring the first back up and down the second file server to do the same thing. What a nightmare! Of course, the entire time in the back of my mind I was thinking, "Why aren't any of our other markets having this issue?"

When I emailed Cris about my plan, he said that every other market's install had their SQL databases installed on the bigger data drive and wasn't sure why ours were installed on the smaller C:

drive. He sent an email to Brian Willard at RCS, and we scheduled a time to get them to move the SQL package to the data drive.

Have you ever conceived a brilliant solution to a problem only to bounce it off of somebody and realize that your solution was overthought with a higher degree of difficulty in every way imaginable? Yeah, me too...

With a simplified, more elegant plan in place, our original RCS installer and their SQL guru

had us place each station into local database mode and they began the process of moving the SQL databases to the data partitions on each file server. The total time for the work took about an hour and a half, and now Birmingham's Zetta setup is just like the rest of the markets, except for the Southern Flair™ that we're known for.

Until we meet on these pages again next month, may God bless the work of your hands.

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

Call him Cnarvis. (His momma wanted to name him Charles but, as he put it, "She couldn't spell good.") His father's last words were a thing of local legend: "Hey, what does this button do?"

Of course there was a crazy uncle as well. Sam had lived by the dictum, "A life without stupidity would be borin'." He had made it to age 37 before strolling between a giant crane-mounted electromagnet and a bucket of scrap nails – a classic example of "wrong place, wrong time."

That magnet, which would hum raucously and dim lights all over the little town of Horvus Neck when powered, was part of the family junkyard. This was no hoity-toity "Salvage Yard;" it was filled with wrecked and rusted cars, corroded appliances and countless other odds and ends. The treasure was guarded by an old, morose-looking hound dog named "Juke."

Cnarvis drove a 68-72-73 Chevryslerford that he'd built himself from scraps. He was handy with a welder. He was a shade-tree mechanic who could make an engine sing. He briefly considered earning money by running moonshine, confident that local law enforcement would never catch him.

But Cnarvis ruled out a life of crime when he discovered an ancient Compaq computer in the trunk of a junked Rambler. He rescued it, along with the 30-odd floppy disks that had allowed the previous owner to install Windows 3.1.

After playing Solitaire for a few weeks, he decided to seek his fortune in "computin'." He scanned the Help Wanted ads in the local paper, but quickly realized that Horvus Neck wasn't precisely a

nexus for Information Technology. Off he went to the Big City, dressed in his finest dungarees, hair slicked down and even wearing some cologne that he'd scavenged from the glove box of a 55 Oldsmobile ...

... Wait A Minute

Many people think that someone like Cnarvis is responsible for inviting malware into hospitals, schools, power companies, banks – you name it. But that's not so. Yes, less-computer-sophisticated people tend to be easier targets, but it's not fair to assume that they're dumb.

Some of the most recent phishing attempts that I've seen are surprisingly well done and could fool anyone who's not very careful. Fake invoices and receipts seem to be popular now.

There's a reason why I use Thunderbird for email: when the mouse hovers over a link, I can see where it actually goes (Figure 1). But as I've also said here many times, the safest thing is to not click a link in email at all. Browse to the website yourself and check on things that way. It's not foolproof, but it's better than landing on a fake site that eats your credentials (and bank account!).

I've stopped trying to report on all of the hacks and compromises that I see in the news nowadays. (The most recent was over a billion – that's "billion" with a B – compromised accounts!) Not only are there too many incidents to keep up with, it can get depressing. Better for me to just say, "Be careful, keep your anti-virus/malware updated and don't click those links!"



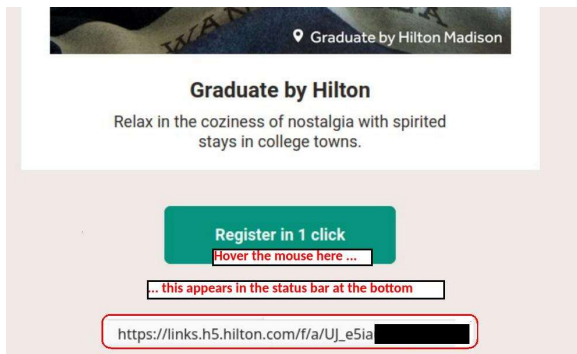


Figure 1 - Confirming the link in an email in Thunderbird.

More Pi, Please

Our top-secret plan to take over the world with Raspberry Pi 3B, 4 and 5s is proceeding right on schedule. (Stephen cackles maniacally. Briefly.) Cris and I have been experimenting with them for a year or so now, with some real help from Todd Dixon, who's a genius when it comes to finding ready-to-go open source software that will run on the Pi.

If you plan to join the revolution, feel free. I'll repeat all of my usual recommendations. Buy a good power supply; an old phone charger may not be able to provide the needed current. Make sure your Pi is on a decent UPS. I'm using a little one that I bought on Amazon for about \$90.

If you power down a Pi while it's writing to the SD card, very bad things could happen. You should properly shut down the device first. (That's true of any computer, by the way.) I use SSH in a terminal to execute "shutdown -r now," but of course, you can use the Pi desktop's shutdown button as well.

You will definitely want some standoffs, extensions and adapters. If a hardware card ("HAT") shorts to ground on a Pi (for example, by touching the metal network ports), bad things can happen. Stand off the HAT with an extension like the ones in Figure 2. I bought both the hardware and the extensions from Amazon for about \$12.

Programming

Most of our stuff to date has been written in Python version 3. It's an interpreted language, meaning that the Python engine reads your plain-text code and executes it on the fly. As I write this, it's the most popular computer language now. It's relatively easy to learn and there are zillions of ready-to-run examples all over the web. Python comes installed for free with the Raspberry Pi operating system.

Contrast this with compiled languages like C or C++. These are translated to machine instructions,

then saved to disk as an executable file. There are plenty of software tools that will help here, but essentially, you must make changes to the code, compile, then check the result, repeating as necessary until you get a good result. The GNU C compiler and a bunch of other free tools are available on the Pi.



Figure 2 - Pi standoffs and extensions from Amazon.

Boy, what a change from my days writing in assembler and ANSI C! Those are about as close to the hardware as you can get – literally in the case of assembler. Back when I was working with the original Z80, you could add two numbers, then take an action based on the result, with something like this:

```
LD AL, 5
LD BL, (some value)
ADD AL, BL
JNZ (some other location)
(otherside, continue here)
```

... which could get quite tedious. LD stands for "Load" (the equivalent in Intel's processors is MOV, or "move"); AL and BL are 8-bit processor registers. The ADD instruction is self-explanatory. JNZ means "jump (or branch) to another location in the code if the result is non-zero." Ah, those were the days.

The same thing in Python might be as simple as this:

```
if( value + another_value != 0 ):
    do something
```

Mail Server

I've been working on this as well and sent out my first warning to existing Crawford Broadcasting Company email users. More will follow. But we'll get some benefits out of this, not the least of which is that everyone will get a new password. That will require that each of our users and partners update their email software, but it's worth it.

One scenario that I use to explain this is that a typical website might use your email address as your login "name." Especially in the past, before the web became a total wreck, you might then use the same password repeatedly on different sites. Easier to remember, right? But if just one of these sites is hacked, now imagine that you used your email password on that site. The hacker has access to your email account and can begin spamming the world.

It's a pain to regularly check and update passwords, but it has become pretty much required

nowadays. Don't ever use the same password for multiple accounts. If you need to, use a password manager. Most web browsers can also save logins and passwords and will allow you to look at all stored passes. That's a good place to start.

The Weather

OK, at least I waited until the end before I mentioned this. Man, it has been stormy here. I know that other parts of the country have experienced it as well, but our ground is saturated. The local agricultural extension offices have even been warning that some trees are experiencing root rot. Root rot. Yay. Ergo, when we have strong winds (of which we've had plenty), trees are going to fall over onto power lines and roads.

We're now into the second half of 2025; hope you have a blessed one. I thank God every day for this company. Until next time, keep praying for this nation!

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

I could use the reference, "The last shall be first," but I'll resist. We just transitioned the four Chicago stations from NexGen to Zetta. We were the last Crawford Media Group market to do so, as all the Crawford markets made the transition this year.

Going last was probably a good idea, as we have so many employees and in a highly competitive PPM market. I would love to say that the transition was perfectly smooth, but that would not be totally true.

The biggest challenge we faced was that we were transitioning two major pieces of software at the same time. We were also going from Selector music scheduling to GSelector.

With the Selector/NexGen model, a separate "flat file" was sent from Selector to NexGen and under long time practices, the music scheduling personnel sent just the songs for the logs, without using the built in Linker portion of Selector to schedule anything like imaging or other items. The clocks were in NexGen and for the most part engineering would make the necessary changes there.

With GSelector/Zetta combination, they are integrated, and the clocks are eliminated in Zetta and

everything but the traffic files are scheduled in GSelector.

Since all of this was happening at the same time, this put a tremendous burden on the programmers because they were learning two pieces of new software and a new workflow function. Most of them had never even seen a NexGen clock, let alone program one.

This was the biggest hurdle we had as they had to be trained to do this work and get their clocks ready in GSelector before we could even begin to transition or train anyone in Zetta. All within a few weeks' time frame. This put us really behind the schedule we had hoped for with taking station's live on Zetta. A lot of long hours were put in, and we eventually got through all the challenges.

At the time of this writing will be our first full week of all four stations being live on Zetta. I still expect that we will face some things along the way that will crop up with the changes. I am very confident that in the long run, this will be a great transition and that the benefits of Zetta will far outweigh the difficulties we had along the way.



**Rocky Mountain Ramblings
The Denver Report**

by
Amanda Hopp, CBRE
Chief Engineer, CBC - Denver

Looking Back

This year is flying by. It's been one project or thing after another, beginning with the Denver Zetta conversion in January. Looking back, I see how so many things should've been done differently.

The goal of the Zetta installers is to teach, to show the various people who will be working with Zetta how to do things. Yes, many of us took the Zetta course to get ahead of the game, but seeing it on a computer screen and doing it in real life are two different things. I for one learn by doing.

Denver's Zetta conversion took too long. The installer had to stay several extra days as he didn't get the work done. As I have watched Samantha Johnson, the RCS installer for Buffalo, California and Chicago, work, I realized what should've been done differently in Denver. The biggest being working on the clocks for the stations ahead of time by the employees.

In these other markets, once she got the audio converted over, she was given a room to use where she could get Zetta installed. Then she would show the appropriate people what to do to get their clocks built.

Our installer did it mostly himself, with some help from me. Essentially looking at NexGen and copying things over. It was very time-consuming, and if you don't know the station it made it even more difficult. Even with me doing some of the work, I don't know some of the stations programming all that well, and I don't mean the main stuff, I mean the fill, the spots and promos that they want airing daily. We did a good enough job to get Denver going, but I have no doubt, the station's ops managers had some work to do to get things the way it needed to be once we went live.

Another big thing was rotations. Many of our stations rely on rotations and have many of them. If these don't get built, that causes empty spaces in the logs. Because we weren't shown what to do and

how to do it, it meant the installer was doing it all himself, for four stations.

And the final thing that could've been done differently was the training. We did have training but that wasn't as efficient as it could've been for many reasons.

Thankfully, we have figured it out after six months, and for things one of us doesn't know, we can easily call RCS. I have worked with Samantha many times on things like AFC Launcher to get many of our shows downloaded and put into Zetta automatically. She helped me get traffic set up to load into Zetta automatically. She has taken so much time to help us learn and do things better than how we had been doing them. She has taken time in each market to really make sure they grasp how to do things and has always been a phone call away once she's done with a market.

I am thrilled that with Zetta in Denver, we are mostly done, finally. We were able to get all four stations loading traffic automatically, we have many of our shows that require downloading being done automatically. We will continue to fine tune everything as we move forward, but it is a big deal to automate a station, to allow it to run itself. It's a lot less pressure on all involved with the station.

KLTT AM-IBOC Woes

On a recent trip to KLTT to mow, I found the ND-50 AM-IBOC had a red LAN light. I did a couple of power cycles to see if it would come back, which it wouldn't. We took it out and brought it back to the office to inspect it further. We discussed with Nautel support and found the issue most likely to be the Exgine.

We ordered a replacement, and when it came in, we installed it but found the unit wouldn't even stay powered on. Upon further investigation we found burned components on another board, something that was not there initially.



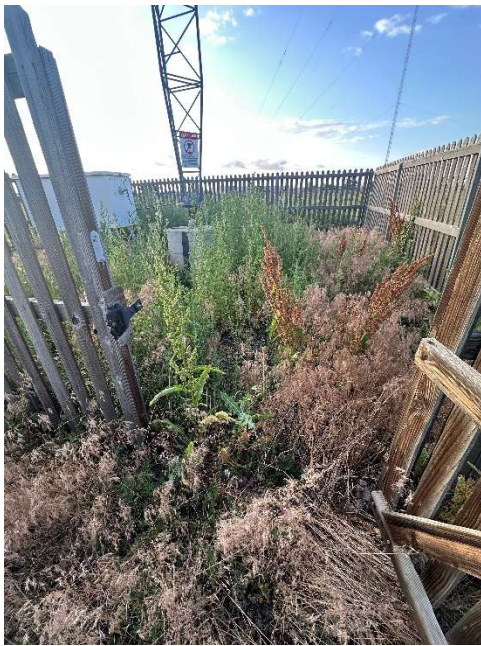
It's hard to say what happened. Perhaps it was already on the verge of burning up and installing a good, working Engine card pushed it over the edge.

We do have a new control board on the way, and our hope is that this will get this unit back in good working order. Thankfully, we did have a spare IBOC that we were able to put in.

The ND-50 is our backup transmitter at KLTT, so this wasn't a life-or-death situation for the station. We need the IBOC for MDCL when we do run the ND-50, and the spare will allow for that as well as keeping us in HD. If we don't have MDCL, we can only run the ND-50 at half power or we get a huge demand penalty on our electric bill.

Mowing

It is crazy just how fast things grow up, especially after rain. We had a good week of lots of rain. And that next week, things really blew up at the tower sites. I had already spent time at KLTT



One of the tower bases that became overgrown almost overnight. I had my work cut out for me.

mowing around the building and getting it all knocked down, but within a couple of weeks it was knee high or taller again. I could see on the cameras that the tower bases were also growing a lot and needed to be dealt with.

I spent a day at the site mowing, getting all around the building taken care of and then driving our John Deer riding mower into the tower bases to

mow those down. I am grateful that three of the four tower bases are wide enough to allow me to do this. I just have to remove a fence panel to allow enough space for the mower to fit through.

I also went to the KLVZ site afterwards and did as much as I could around the building and tower bases. We had a small area of Canada thistle growing up that I couldn't deal with but needed to. I had received a call from the county about it. They get very unhappy when the thistle goes to seed because of all the farmland it affects – our site is on the South Platte River, and downstream farmers take river water for irrigation.

I spoke to the guy who keeps horses out at KLTT and somewhat guilted him into going out and mowing it down for us. We allow him to keep his horses at KLTT, free of charge, so he owes us. Thankfully, he was able to get out and take care of it quickly so that we wouldn't get in trouble. I still need to get the Kubota out there to really deal with more growth, but it's growth that won't get us in trouble, at least with the county.

I spent another day at the KLZ tower site mowing inside all the tower bases. These were almost unmanageable, and, on that day, everything quit working for me. I had to fight with our power equipment to get it to run. I did the best I could, got the growth knocked down close to the towers and was able to mow a good path to each tower. There is still a lot of work to do in the tower base areas, but thankfully, the field isn't bad. I will plan another day at the site sometime in July.

Lookout Mountain Antenna Switch

I had a brilliant idea recently. We needed to do a software update on the Nautel transmitter up at Lookout Mountain for 95.3FM. But that is our best FM, and people will notice it going off air. We had no way of putting it on the backup transmitter without a trip to the site.

At the KLVZ-Day site, for 94.3, my dad and Stephen got a Raspberry Pi to work as a controller to switch back and forth from the main to the aux transmitter. My dad took a rack panel and installed the Pi, a power supply, a coaxial relay and some push buttons so all we have to do is push a button to switch transmitters, just like with the Kintronic antenna switch controllers we have around the company.

For Lookout Mountain, because this is a shared site, we didn't want to make it that easy to switch from the main to the backup, so it's all done over SNMP. This will save us a trip to the site, which can be impossible to get to in the winter.

Looking Ahead

July is here, which is crazy. So, first, happy Independence Day! I am grateful to live in a country where I have so many freedoms. We are truly blessed to live in this great country.

July will no doubt bring more mowing. Thankfully the KLZ site isn't bad yet, so I hope I can put off mowing until closer to the end of July. I do think July will be filled with mowing regardless. I am just taking one day every couple of weeks and spending it at one or two sites to help keep things manageable.

I also hope to get the AM-IBOC for KLTT back in good working order. A good cleaning is needed at the FM cabinet at the KLTT site, as well as in all our buildings. I like to keep equipment and the transmitter buildings cleaned up as much as possible.

I do hope I'm done needing to work on Zetta. We have had some sporadic issues that RCS is still trying to figure out. I'd rather those issues just be gone forever. Only time will tell. Hard to find what is causing the issue when it happens once and then not again for weeks.

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

The Local Oscillator
July 2025

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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