The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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A lot has happened over the past month. Regular readers will recall that we were in June hit with the double-whammy of a tower collapse (instigated by a farmer pulling an implement with his tractor) in our Detroit market, and a dual antenna burnout at WXJC-FM in Birmingham. I'd love to be able to tell you that everything has been fixed and back to normal, but that's not the case. There has, however, been definite progress.

WRDT Tower

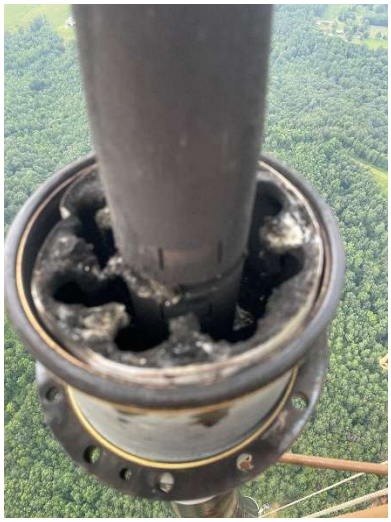
At the Monroe (Michigan) WRDT day antenna site, cleanup of the collapsed tower and guy cables has been done. We have building permits for the tower replacement, and tower steel has been ordered. Anchor steel should be on site shortly, and Great Lakes Tower will start excavations for the guy anchors and get those installed and ready before the tower arrives. We're also waiting on the base insulator, adaptor plate, Austin transformer and Austin mounting bracket. Those should be at the site soon. We already have the new "eagle's nest" static dissipater array for the tower top.

The plan is to stack the tower with a crane, so the actual tower construction should go fairly quickly. We will have to pay close attention to the top loading, which is done by means of shorting the top guy wire segments to the tower and then connecting their ends to one another like a spider web. Once the tower is up and the feed tubing is connected to the antenna tuning unit, we'll have our friends at Munn-Reese make a new set of base impedance measurements, and I will run a new moment method model. Mike can tweak the array for the new operating parameter set, which should be close to the old numbers, then he and Steve can make new reference field measurements and I will write up and file the proof and license application with the FCC. It's a process for sure and will take some time, but there is light at the end of the tunnel.

The station remains on the air at 25% of the daytime power from its night site up in Ferndale, adequately covering the market while we work toward a tower replacement.

WXJC-FM Antennas

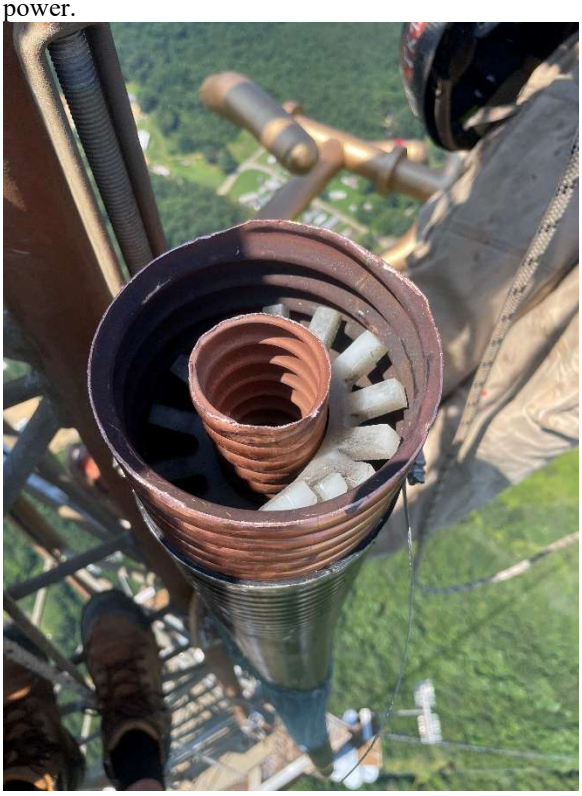
In Birmingham, a tower crew from ERI got the tower rigged and took the old, damaged antenna down. It was toast, full of soot and other debris from internal arcs. The bad news is that when they got down to the end of the transmission line where it connected through a 6-inch to 3-inch reducer, molten metal and other debris from the antenna had melted through the Teflon of the 6-1/8" EIA connector and allowed contamination into the transmission line (as shown below).



The tower crew got the new antenna up on the tower and ready to go. The problem, then, was how to get power up to the antenna. I had the tower crew cut the 5-inch line back a few feet at a time to find out how far down the contamination went. We had one 12-foot piece of 3-1/8" rigid line plus a new 6- to 3-inch reducer, the total length of which came to about 14 feet. We also had a new connector for the 5-inch line that I had

purchased 20 years ago when we were having a lot of copper theft and I thought it wise to keep some spare critical parts on hand.

So the tower crew cut the line back to the lowest point that we could reach with the rigid line, reducer and connector, and while the interior of the line looked a lot better at that elevation, the Teflon still wasn't completely white and clean; there was still some soot in evidence. But without further resources, they went ahead and installed the new connector, reducer and rigid section and got the new antenna connected. We ran three bottles of nitrogen through the system to remove any vestiges of moisture and turned the transmitter on at low power. Everything looked good, with very little reflected power.



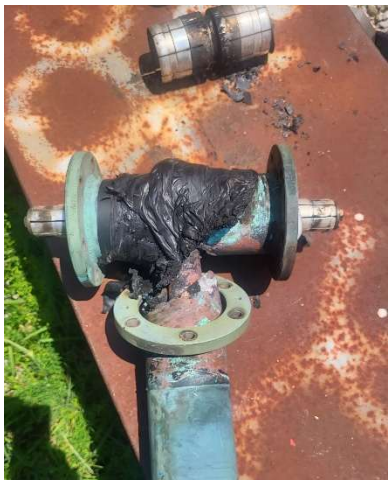
The end of the line before the new connector was installed. Not too bad but not pristine.

I calculated that 10 kW would produce a peak voltage of about 1 kV in the line, so I set that as a self-imposed cap as Todd continued increasing the transmitter power. At 10 kW, the VSWR was showing to be 1.018:1, and there wasn't any evidence of arcing. So that's where we left it. 10 kW TPO produces about 38 kW ERP from the system, and I filed an STA request with the FCC for that power level, and it was granted. That's where things still are at this writing. Todd reports that the station is very listenable throughout the market and even beyond.

So how do we get back to full power? The short answer is that we go a couple of hundred feet below the antenna, where we hope to find some pristine line. The problem is that Commscope does not make HJ9 5-inch air dielectric line anymore. RFS makes 5.5-inch Heliflex air dielectric line, but not in the U.S. It's insanely expensive, and it would have to come over on a container ship, meaning it would take months to get to us.

Rather than wait for a 200-foot piece of 5.5-inch line, I ordered a 200-foot length of 3-inch line. The plan is to move the 5-inch connector from its current location to a point 200 feet down the line, install the reducer there and connect it to the new piece of 3-inch line. We used 5-inch line when we built the system because of its lower loss, not for power handling. Subbing in a 200-foot piece of 3-inch line will increase the loss a little bit and require a few hundred more watts out of the transmitter to make licensed ERP, but we have plenty of headroom in the 40 kW transmitter.

The other issue at the WXJC-FM site is the auxiliary antenna, an 8-bay Shively 6810. The power divider tee was toast, evidently the result of a mechanical failure and moisture intrusion.



Yep, that's "toast" – the PD tee from the Shiveley aux.

The ERI crew replaced that tee, and they found that the interbay section just above it had been improperly installed, resulting in a "split bullet." We have ordered a new section and it should be on hand shortly. Hopefully that antenna will come up and work once we replace the damaged interbay section.

So… definite progress. WXJC-FM is back on the air, at reduced power but still covering the market. And everything is in motion for the WRDT tower replacement.

The interbay just above the power divider tee in the Shively aux. Somebody split a bullet when the antenna was installed.

A Friend Returns

If I mention Bill Stachowiak, many longtime readers will immediately recognize the name. Bill's company, S&B Communications, provided excellent contract engineering services to our Buffalo station back in the 1990s and early 2000s, and they helped us with a number of projects in other NY markets as well. Brian Cunningham worked for S&B for several years, and we were able to lure him away some 23 years ago.

When Brian gave notice of his retirement back in June, I immediately began a recruitment for a replacement, which was no easy task. I put the word out through SBE Jobs Online as well as through other online and local recruiting sources, and I contacted just about everyone I knew in the Buffalo and Rochester markets. We had a number of applicants, but all that were truly qualified were out of state.

Then, as I was considering my limited options, Bill called me. Bill has been retired for some time now, but he offered to come aboard as our Buffalo/Rochester market CE and train a replacement in the process. That was an answer to prayer. Josh Myers is a very bright young talent educated in the recording arts and competent in IT. He has worked for us in Buffalo for many years. I knew that Josh could handle the studio end of things, but he has no knowledge or skills in the RF arts. Bill coming aboard and taking care of our facilities while training Josh in all things RF is a perfect solution. I know Josh will be a quick study and become competent dealing with transmitters and antennas.

So we welcome Bill with much enthusiasm! Drop him a note at billstak@crawfordbroadcasting.com and say hello.

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

Hello to all from Western New York!

It seems so surreal that the time has come for retirement. Somehow, in the past, I did not envision the ending coming this way, i.e. a forced medical retirement. I always thought that I would end up working until I dropped or working until technology simply passed me by, leaving me like a tumbleweed blowing aimlessly about in a desert windstorm.

At this moment in time, I am not sure how I will react to not having a purpose or calling to look forward to each day. Sure, my wife has a million ideas, but her way of thinking and mine are two different animals that should not be caged up together. I guess that's how we managed to stay together for 50 years – she had her reality (home), and I could escape to mine (work). Sure, there were always the unexpected events that happened, but those work events I had training for, experience, and knowledge of what it would take to solve the issue. Not so much in her world.

You see, we (men) just don't see things from a woman's perspective. We see a problem, think about it, then go fix it. Plain, simple, the end. Men like to take an issue head-on, conquer it and move on, whereas women like to circle the wagons, approach the

problem from different angles, chew on it awhile, then think about it some more, make a decision, then second-guess themselves and start the process all over again. I don't know how I will fare in that world, but only time will tell.

For those of you who do not know my path to broadcast engineering, I will give you the Readers Digest condensed version…

In 1966, I began working for my father's business, a radio & TV sales and service company. My dad began teaching me electronics in my early teens, hoping that someday I would join him in the family business. In 1968, his company sponsored a 2-hour radio show on the local radio station (WKOA), hosted by the station owner's son, my cousin, and my oldest brother. I would come down with them on Saturday morning and sit in while they did the show.

After several weeks, I realized that I could do that, too, and got the opportunity several months later when my brother stepped away for baseball season. I honed my verbal skills and learned how to run the Gates Dual lux II console, among other jock duties.

On February 07, 1969 the station hired me to do Saturday and Sunday shifts, along with any other fill-in work that became available. As I had some basic experience with electronics, I followed the station chief engineer around to learn more about what it took to keep a radio station going. Poor guy. I'm sure in the beginning I was a pest, always in his way, and asking about a bazillion questions, but in time, he began to see that I had something and could be of some use to him, so he went to the station owner and convinced him that I would be a good candidate to hire for an engineering assistant.

Fast-forward through high school, I worked at the station at every opportunity, whether on air or assisting the chief along with working at my father's business. When graduation came, my father offered to have me join him as a junior partner in the business, which I instantaneously declined. I did not want to spend the rest of my life fixing broken TV's radios and consumer electronics. I was hooked with broadcast engineering. Even the DJing on air did not satisfy me as much as performing engineering tasks.

My dad was understandably disappointed, but knew where my heart was and gave me some advice that I still remember today. He told me, "When you work for someone else, they are buying your time, investing in you. There are probably thousands of other people more qualified and deserving, but you were given the opportunity. Do more than what is expected of you, give your employer more than their money's worth, prove your value." For the past 56 years I have adhered to that advice, and it has served me well.

Getting back, I worked with WKOA/WKOF for 22 years, and in 1991, my wife and I decided to move to Buffalo, NY for better opportunities. It took several months to find gainful employment, and that was in the form of maintenance engineer at the McGuard factory in Orchard Park, NY.

When I arrived in western New York, I applied at every radio station within a 50-mile radius of Buffalo, but could not get in the door of any station, so to put food on the table, I took a temporary job at the McGuard factory. They liked my work ethic and attitude, and offered me a full-time job there, but luckily, I got a phone call from S & B Communications, who was looking to replace a staff engineer that had just resigned. They had received my resume from one of the stations I applied to and called me immediately to come by for an interview.

They could not believe their luck. They figured it would take months to find a replacement engineer, or never at all, and my resume just fell into their lap, and to top things off, I only lived about two miles from their office! I was hired by the owner, Bill Stachowiak, after a brief interview, and spent the next 11 years in his employ, all the while remembering the advice my dad gave me so long ago.

In 2002, the economy went a little sour, and the cost of doing business in New York state skyrocketed, and S&B Communications was experiencing some finical hardships. Several years prior to that, I received a call from Cris Alexander, Crawford's Director of Engineering, inquiring if I would like to join the company as a market chief engineer. Mind you, Crawford Broadcasting was one of S&B's clients at the time, and I dutifully declined the offer, but in order to satisfy Crawford's wishes to have a dedicated engineer on board for only their stations, S&B agreed to assign one of our staff members to handle only Crawford stations under my guidance.

This arrangement lasted for nearly three years, which brings us to 2002. I knew that S&B needed to reduce the workforce in order to stay afloat, and Bill Stachowiak did not want to do that, thinking he could find another way to keep everyone on board. I phoned Cris at this time to see if CBC was still interested in hiring a staff chief engineer. He seemed to be very interested in hiring me, and after several weeks of negotiations, I joined the Crawford Broadcasting family's engineering department, responsible for the stations located in Buffalo, Rochester and Syracuse New York.

It has been nothing short of outstanding during my nearly 23-year tenure at CBC, and at no time did I ever regret the decision I made so long ago. I looked forward to coming to work each and every day, and every day was unique from any other.

I cannot comprehend how fast the time went, and all the issues I dealt with over the years, looking back, it is all now but a blur.

In 1974, Paul Anka came out with a song titled "Times of your Life." In it was a verse that said, "Memories are but times that you borrow, to spend when you get to tomorrow." I have so many memories of the past 56 years, some good, some bad, but they were all learning opportunities that helped me grow as an engineer. And growth cannot happen without people.

Cris has mentioned in the past that CBC has the best core of engineers around. This is so true. Each and every engineer in our company is ready and able to help out when called upon, and I have relied on most of them often. To each and every one of you, thank you! I treasure the friendships I have made over the years and am thankful for the opportunity to get to know you all.

First and foremost, thank you Mr. Crawford and Don Crawford Jr. for the privilege of working for such a fine company. I hope that my work fulfilled every expectation you had, and you felt that you received value for my time that you purchased.

Special thanks to Cris Alexander for taking a chance on me. I hope there were no regrets on your part. I know that there were times I had you pulling your hair out, but I always had the stations and your best interest in mind.

To all those others at the corporate level, Mike Cary and Debbie Roby, thanks for all your help over the years. Your assistance and help from time to time proved to be a valuable resource in helping me run the engineering department in Buffalo and Rochester.

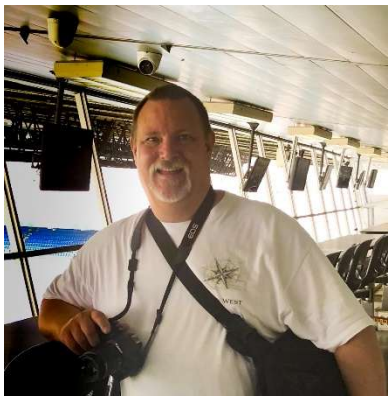
Last, but certainly not least, thank You Lord for your guiding hand in orchestrating such a wonderful and fulfilling career. I saw Your hand at work at each and every milestone. It was for your glory in everything I did.

That about wraps up my career here in Buffalo and Rochester, and until we meet again on those streets paved with gold, be well, happy engineering, and I love and respect you all!

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

The Fallen Will Rise Again

Last month I told readers of the *Local Oscillator* all about the accidental severing of four guy wires and the ultimate structural failure of tower number 4 at our Monroe, MI transmitter site for 560AM WRDT.



The twisted remains have been removed from the property as we await the arrival of a new tower we have on order from the manufacturer. This new tower comes from Sacramento, CA and I'm anxious to see how it's delivered. I suspect it'll be eleven 40-foot sections. We'll see. Meanwhile we have other formerly vertical assets to worry about.

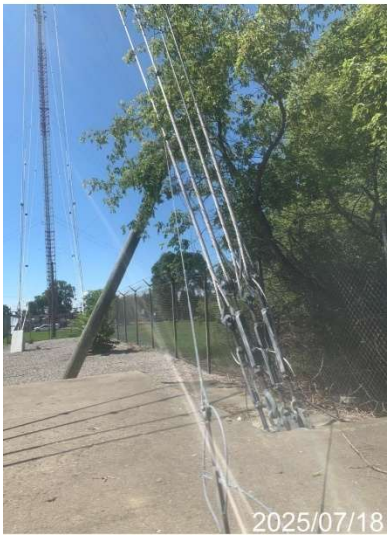
Pole Position

WRDT 560AM has a somewhat unique nighttime transmission facility. For years, WRDT was a daytime-only station and obeyed the mandatory sunrise to sunset schedule for sign-on and sign-off. My former employer, Greater Media, owned 560AM at the time it was decided to find a way to run the station 24 hours. The way it was accomplished was by creating a skirt on a 1000-foot FM tower and shunt feeding it.

A skirt antenna is simply a wire on insulated standoffs mounted to one leg of the tower. That part was simple, but a vexing issue in this antenna design was how to create the station's requisite ground system. The tower sits in a suburban industrial park with adjacent office buildings, transmitter buildings, parking lot, a road, and a steel transfer facility, all within the needed circumference of the ground system. Obviously burying the usual ground mat was impossible.

The solution was to run three horizontal steel wire cables from the base of the tower in each of the three directions of the tower's guy wires. This

would form an elevated ground plane and complete the antenna system.



The broken pole that was supporting part of the WRDT night ground cables.

These three wire cables were supported by utility poles on their way to the guy anchor points of the main structure, where they would be insulated before terminating into anchor points of their own on top of the concrete overburden associated with the main guys. This works surprisingly well, and even though the FCC would only authorize a miniscule 14 watts of nighttime power output, 560 can be heard at night in three counties.

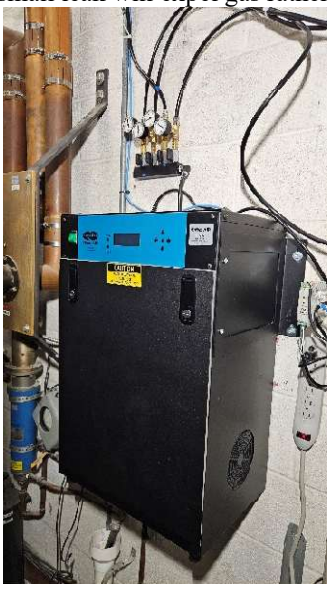
One of the eleven utility poles used to support the ground system about 15 feet above ground level recently decided its work was completed and fell over, being stopped by the wire it was supporting and the tower's outermost lower guy wire. It's not precarious and it's inside the guy anchor fence, so it doesn't pose any danger to anyone, but it has to be replaced. One would think that a wooden utility pole, examples of which are ubiquitously common, would be easy to find. So far- not so. We're exploring our options.

It's the Dry Air

Broadcast engineers are almost always familiar with RF cabling used for high-power transmission systems. These cables often have an air dielectric used as an insulator between the outer shield and the inner conductor.

If you've ever seen the end of a TV coax cable, you've seen a tiny version of what we use to connect our transmitters to our antennae, the difference being that the tiny RG-6 you use for your cable TV has a nylon insulation separating the inner and outer conductor whereas a higher power capacity 'transmission line' uses a gaseous agent, sometimes nitrogen, sometimes sulfur hexafluoride, but mostly just plain old dry air at a surprisingly low pressure.

Apart from being the dielectric insulator, the gas is useful in that a small leak will expel gas rather than admit moisture. Moisture in the line reduces the dielectric constant of the medium and can cause the high voltages present to arc between the inner and outer conductor. A sustained arc can ruin a transmission line quickly. I've worked with and maintained nitrogen generators, and many makes, models and sizes of air systems. From simple high-pressure nitrogen cylinders with a regulator, to dry air systems and manifolds I've built myself. One system I knocked together, fed eight unique lines and featured a dental office compressor.



Our Altec Air pressurization system.

None has come close to the Altec Air P550W system I've just installed on our FM antennae here in Detroit. The Altec Air seems to have been designed by someone with the exact same wish list as mine. Here's the lowdown.

The unit can be installed on the floor or mounted on the wall or even a standard 19" rack – appropriate brackets are options. I chose the transmitter room's concrete block wall for my unit's permanent perch. This spot kept it close to the antennae gas barriers but up off the floor and above a drainpipe that would have pushed it too close to the transmitter.

An optional four-port manifold is mounted neatly above it, allowing me to feed the two three-inch antennae line and back feed our nitrogen cylinders should I need to revert to it in an emergency. I had to reverse the direction of the inline check valve to allow the input from the nitrogen.

The unit provides super dry air by way of a twin diaphragm compressor and a desiccant filled heatless dryer. The entire process is controlled by a Raspberry Pi, which features an excellent web-based

user interface, comprehensive alarms, and a full array of SNMP access to status, metering, control, and alarm reporting. There is a common alarm relay you can wire to your supervisory system should you choose not to implement SNMP, but of course that only provides indication that something is wrong, not what is wrong.

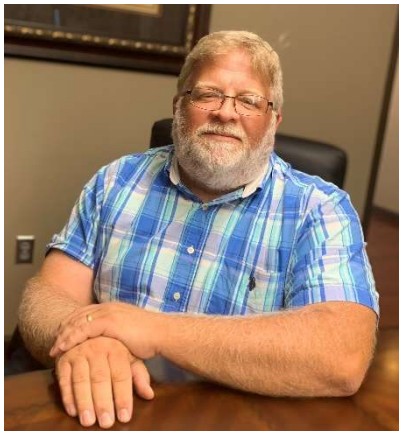
I've made extensive use of the unit's SNMP functionality and have remote supervision of six alarm conditions, seven meter values, and status of the compressor and cabinet cooling fans. I also have remote alerting when the unit requires its routine maintenance.

I decided to contact Altec Air with a few basic questions as I was installing the unit. Their technical support was excellent and helped me thoroughly understand the unit and tailoring it to our specific needs.

As I was setting up the SNMP I had a few ideas and contacted them again. Their response was open-minded and it looks as though they will be adding my suggestions to their next firmware release. I couldn't be happier with this unit. Hopefully, it's as reliable as it is impressive.

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

The beginning of July brought an ERI tower crew to our Cullman site to install the replacement 8-bay SHPX-8AC antenna to handle the damage that had been caused from a grand mal lightning strike.



The first day they were here was coming off of some massive rainstorms. The crew had two Lull type lifts delivered in order to get their 17,000 lb. winch, a 10-foot Conex work container/tool shed and their weight for the tag line they needed to rig up to the site. The site was so wet that the Lull lift tandem wasn't able to work its way up the hill. We needed something heavy duty with tracks to pull the lifts to the level part of the site.

After calling our go-to contractor, Sunbelt Builders, to see if he had any contacts that could help, he got me in touch with Brian's Contracting and Excavating.

Brian was doing work at another site but loaded up his Caterpillar D-6 dozer and was on site in less than two hours. You may be trying to imagine how the crew was trying to transport their equipment with the two lifts. What they were attempting to do was to have one lift in reverse with its forks lifting the front of their gear and having the second lift going forward with those forks lifting the rear of each piece of gear.

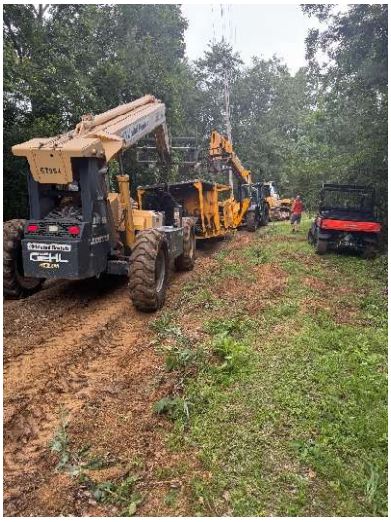
Once Brian got an idea of what the crew wanted accomplished, he chained his dozier to the lift at the front of the train and pulled them up the hill. They got all of the equipment up the hill and placed where they wanted it and we were ready to get busy laying out their cabling for the next day.

Once the crew got the tower rigged the following day, they began taking down the old antenna and there ended up being a lot of soot and contamination from burnt Teflon near the reducer coupler and our feed line. They continued their work hanging the new antenna, but we knew that we would have to do something about the debris at the end of our feed line. We had the crew make cuts down the feed line until the copper and Teflon spacer in the Heliax looked to be an "acceptable" amount. That distance ended up being about 14 feet. We had a 12-foot piece of Myat that we brazed flanged ends on in order to make up the distance that was cut with clean line.

We decided that we could get away with feeding about 10,000 watts through the line until we could come up with a better plan. Cris worked on getting the STA in place with the FCC.

Our plan is to have the same crew back in their next available opening in September to insert a 200-foot piece of RFS HCA300-50J 3-inch Heliflex line that will connect to the antenna and then we'll move the reducer coupling down to the bottom of that new line and connect it with our current line. Not only will this addition make sure that we are out of any contaminated part of our feed line, but it introduces some extra loss that we didn't have with

the previous cable, so we'll have to adjust the TPO from our Nautel GV40 to around 29.4 kw in order to get to our licensed100,000-watt ERP.



Here's a picture that explains the process we went through to get equipment placed.

The crew will also be replacing a couple parts in our Shively auxiliary antenna while they are doing this work. So look out in the *Local Oscillator* October issue for "Antenna 3 – The Finishing."

I Wasn't the Most Popular Kid, Either

The end of July has been filled with RCS Zetta joy. I mentioned last time that we had our SQL database moved from the "C" partition of our file server drives to their data partition. I should have known better to believe that we were just going to skip down the yellow brick 4road to radio automation nirvana after that was done.

Earlier in July, our C drive got full and caused off-air time due to Zetta not respecting the recycle bin day limits for the system. Now we know to look out for that pothole.

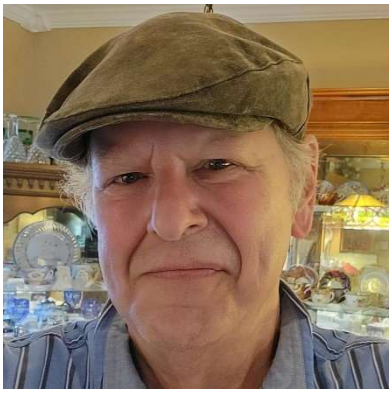
Our latest issue at the end of July is some temporary files in the Zetta program data folder that aren't removing themselves. I think I have just come to believe that there is going to be something in RCS code that actually just hates me. Unlike the antenna saga above, which will have a finite number of chapters, I refuse to put chapter markers on the RCS portion of my job. It would be worse than the Friday the 13th movie series if I did.

As I finish up this month's column, we were just notified that one of our salespeople, Dennis Reno, and his wife were in a motorcycle accident. Details are not totally known regarding the collision with a car, but his wife apparently has a broken pelvis, and Dennis has a broken back, a bleed on his brain and a broken eye socket. If you have a moment to pray for their healing, I know it would be helpful. Dennis and I talked briefly just yesterday in the hallway. It makes you consider how fragile and unpredictable life can be. I am thankful to God for the family, church, friends and career that He has given me.

Until next time, may God bless the work of your hands.

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

First, I'll extend a warm IT-lish welcome to Bill Stachowiak, our newest engineer! Bill, welcome aboard!



Now, you have been warned: this month I shall rant about Neck Beards, The Big Guys and Ubergeeks. Put on your helmet.

The buzzwords and acronyms associated with information systems have gotten out of hand and have been horribly overused by marketing departments. "The Cloud," "Artificial Intelligence" (or "AI" if you're kewl) and my current favorite, "Quantum." Quantum computing, quantum processors, quantum bits (acronym-ized as "qubits"), quantum mayonnaise, you name it. Quantum hairdryers are sure to follow, and I suspect Harbor Freight will soon offer an assortment of Quantum Screwdrivers for $10.

Figure 1 is IBM's Quantum System One, which has a whopping 20 qubits. System Two, its successor, has three of IBM's 156 qubit Heron processors, but is expected to expand to 4,000 qubits sometime this year. They don't say what the increased power load will be. But once Quantum Computing is married with AI, well, that'll be the day! The qubits, being very short-lived, quantum mechanical and thus ornery and ethereal by nature, must be painstakingly

controlled, shielded, with all sorts of error detection and correction, but that's irrelevant. PROGRESS!

These processors require liquid helium for cooling (both H4 and the much rarer H3, which is even more expensive) and superconducting cables that are sourced from one (1) supplier in Japan, but that's just gravy on yer smashed 'taters. I've mentioned here previously about the demand for electrical power and cooling associated with data "farms." Quantum AI will increase this load

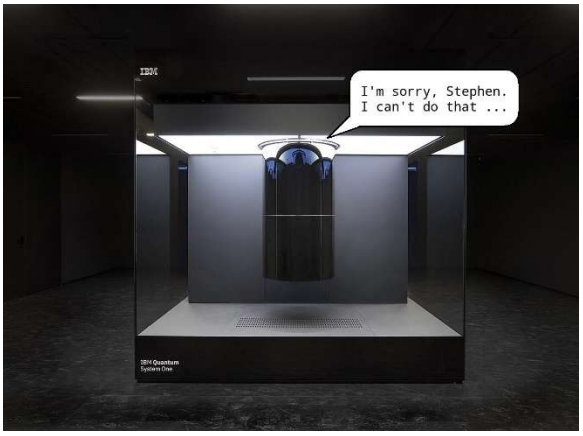


Figure 1 - 20 qubits, liquid helium cooling and draws as much power as yer condo!

dramatically.

Yes, your electric bill will go up so that Gen X and Gen Z can ask life-changing questions like, "What movie starred a guy with blond hair who saved the girl with red hair from a bad guy with greasy hair?"

I don't claim to be an expert and I don't doubt that eventually, they'll be able to make this work on a larger scale. Quantum computing will supposedly be able to attack problems that cannot be solved by anything else. But to me, it's like welding turbofans onto gravel trucks to make them go faster. Cluster computing and super processors like AMD's Threadripper are pretty awesome, although I admit, they require lots of power and cooling as well.

The Internet is already overloaded; now the 'sperts want to allow Quantum AI systems to argue with each other all over the globe. What could possibly go wrong?

Broken Packages

I've mentioned this in previous articles, primarily during my struggles with Google's App store: things updated haphazardly, breaking existing code. New requirements that require a degree in Chaos Theory. And it's not just Google; Microsoft and Apple have both had serious problems with recent updates.

While building our new mail server, I ran across this several times. According to the folks who make software packages, they must insist on specific versions of the stuff that they rely on or it might not work. For example: the Carbonio mail server, the natural successor to Zimbra, is only supported on either a specific version of Ubuntu Linux or true Red Hat Enterprise Linux (RHEL). If you use anything else, even a binary-equivalent clone of RHEL such as Rocky Linux, you're on your own.

I couldn't get it to work, so I switched to iRedMail. After several tries, I finally got it to run.

Figure 2 - Hey, Bubba, let's put some jet engines on this thing!

SSL Certificates

Back to the Big Guys. Their latest brainstorm is that SSL certificates should be renewed much more frequently. At present, a typical cert lasts a year. They want to shorten this to less than two months by 2027.

One might assume that the Big Guys just want to sell more certificates, but if that's the case, they haven't thought their fiendishly clever plan all the way through. One very popular alternative is called "Let's Encrypt." Look it up. They offer good certs for free solely because they want to help the 'Net move to all-encrypted data. I've been considering them myself because they even offer auto-updating so that we don't have to scramble every few months.

Distributed Denial of Service (DDoS)

Also mentioned here before: state-level Bad Guys no longer hijack just one or two servers. They will patiently compromise a host of them, scattered all over the place, then unleash them all at once. The largest DDoS ever recorded, at this writing, was on

June 20th of this year: 37.4 terabytes of data delivered in about 45 seconds, from 122,145 source IP addresses from 161 different countries.

What this means for us Little People on the tail end of things is that our Internet service will suddenly stop working for no obvious reason. Your 'Net will be overwhelmed until automated systems can identify and block each of the offending IP addresses. There will be times that you can't access something over the Web. You'll just have to wait it out.

Note that these DDoS attacks are relatively benign as far as stealing your data. They're more irritation than catastrophe, though things can get tense if you're waiting on an important email from a client, or need to access some documents in "the Cloud." But I do wonder what this might do to audio delivery via Internet.

Odds and Ends

The new mail server has been built and I'm current loading the hundreds of email addresses, with all new passwords, into the database. I've written several scripts to help automate this process, but it still takes time. Given that Detroit is still wrestling with a fallen tower, and that our own WXJC-FM here in Alabama needs more antenna work, we're going to push the final switchover into late September or early October. Until then, I'll just have to keep a gimlet eye on our existing server.

That's enough for this time, but the lawyers want me to mention that all trademarks mentioned here are the property of their owners, and the images are free-use under Creative Commons licenses. You may now remove your helmet, but until next time, keep praying for this nation!

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

Zetta

We recently transitioned from NexGen to Zetta as our playout system. At the time of this writing, we have been on Zetta for a little over a month. For the most part, we are past the initial problems you normally face when you have that kind of move.

The staff have embraced the change, and I think they are anywhere from fine to loving the new software. I may not hear everyone's opinions, but for the most part it has been well received once they have got to a certain comfort level with the software.

The big difficulties that we had in the transition were with the programming staff learning to use the clocks in GSelector. Those issues have seemed to die down for now. There have been a few issues lately with reconciliation.

We must give a "live" reconciliation file to our traffic report spots that combine a report with the sponsor commercial. They are one entity as far as Zetta is concerned. However, we also play a music bed under the report part of the spot and sometimes we see the ID for the bed show up in the reconciliation instead of the spot. This is a current issue we are working through.

We also have experienced some problems with the last part of the hour or top of hour where the song of the hour will just get cut off and then the sequencer will stop playing, waiting for the top of the hour. This has occurred a few times and at least once was considered a user error with the segue editor.

LXE Issues

Once we had the Zetta software transitioned, we moved to the new update for our Wheatnet AoIP system software, which included the new Navigator. This was a late-night session due to the possibility of short off-air moments.

We were updating the software because it was time to move on with the rest of the company, and we also had an issue with static on the speaker feed along with the headphone feed experiencing the same static in one of the control rooms. It was thought that with the update the problem would go away.

Once we were finished with the update in this room, the static didn't go away. I decided to reboot the entire room since it was in the middle of the night. Unfortunately, after the reboot, the first 8

input modules were not working correctly.

We put this station on the air from our spare control room and came back at the problem in the light of day when we could involve the Wheatstone support department.

They suggested that we take all the modules out and add one at a time to see if there were any bad modules holding off the panel card from being read on the network. We did this, and somehow came to the conclusion that we had three bad modules. Huh?

Wheatstone support rightfully challenged us on that conclusion. So, we once again went back to trying a module at a time. At this point, we started seeing issues with modules on the second 8-module panel, but we got it back up working and realized we only had one bad module.

We sent the bad module to Wheatstone for repair and then we ordered a replacement module for us to use in the meantime. When we got the new module, it was strongly suggested that we take the time to take apart every connection in the LXE control surface and clean it with contact cleaner.

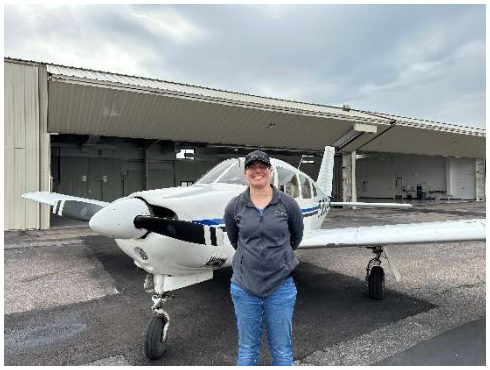
We did this, and this time when we put everything back together, the third panel was having problems with the last module slot pulling down the panel card. We had to leave our final module disconnected in order to bring the surface up with everything else working. It is not a bad module, as we have swapped them around to see if there is any difference. But as I am writing this, we will be soon working with Wheatstone support to get to the bottom of the issue and maybe what is the bottom-line issue with the control surface. Hopefully, it will be resolved the next time I write because I have nothing but great experiences so far with the four LXE Control Surfaces we put in place five years ago.

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

Summer is ending soon. I have no clue how that happened, since it just started! I haven't had the time to mow at the sites like I would have liked. I did have some annoying issues to deal with.

The Trouble Site

KLTT is a trouble site, or so it seems. I noticed our main air conditioner unit was not keeping up with the heat. I tried running on our backup unit with the same issue. The main unit was cooling, but not well enough. The temperature would eventually get high enough that it would switch to the backup, and it, too would never cycle off and would run all day.



We were finally able to get someone out to look at the main unit and they found one of the compressors in the RTU is done for and is out of warranty. This is going to be a very costly repair. When we got this unit installed six years ago our hope was that we would have a dependable unit with no issues for a while. This unit has been a troublemaker since day one. I am waiting to hear if we will do the repair or just get the backup unit fixed and working and use this main one as our backup. It all depends on what the issue is.

The other issue we had at KLTT is the day/night pattern switching. Savvy readers may remember a past edition where we talked about this same issue. We thought the underground cable was beginning to go bad. Turns out it is. Two of them in fact. We'll have to replace them, sooner rather than later.

This time, the issue was still at towers one and two. We found the trouble wires and swapped them with unused conductors in the same cable. Thankfully, we had some at each tower we could use.

We did use the last one at tower one, so when another issue cropped up a week later, we didn't' have a spare conductor to use. So we took the ground wire in the cable (which was still apparently intact) and disconnected it on both ends. We ran a jumper from the 24V ground wire in the controller to the ground strap in the rack, and then in the tower 1 and 2 antenna tuning units, ran jumpers from the ground strap to the 24V ground terminal. That worked, Using the strap as the ground return for the 24 VDC supply freed up the black wire in the cable to each tower and we were able to use that

conductor for the one with the failed wire, thank God. But if the issue comes back, we won't be able to pull another rabbit out of our hat.

Zetta Issues Continue

We continue to have issues on our four stations with long-form programs stopping before they finish. There is no rhyme or reason. It could affect one show today and a different show tomorrow. It may also happen multiple times a day, then not again for several more days. RCS has been trying to find a cause. I must let them know every time it happens, and the hope is they can find the cause and fix it. It is costing us money because we must credit a client anytime this happens.

SBE Picnic

Every July, SBE Chapter 48 hosts picnic up at Lookout Mountain in Golden, Colorado. It's always a fun time. I have been planning the event for several years now. We had Famous Dave's provide some delicious barbecue. I was able to get some great prizes to give away from BSW, Pro Audio, Broadcasters General Store and MediaProxy. I am always appreciative when vendors provide these items.

This year, the morning of the picnic, I received a phone call from the City of Denver. They hold the rights to the park where we host the event. It turned out Search and Rescue was using the picnic site for the day for training. They ended up moving us to a different location not too far from that one.

We had a great turnout, if I remember correctly, we had thirty-eight people show up. It did rain a bit on us but besides that it was a great time.

Looking Ahead

I cannot believe August is here. The first full week each year, my parents, husband and I usually all go on a family vacation. This year, we're off by a week, so we will be going the second full week of August. I am looking forward to having a week off work, but I am also a bit worried. I need to find someone that can cover things for me if something goes wrong. I will ask a couple guys I know to see if they could be available if needed. I am grateful that in the last few years things have run smoothly. And at least I have good internet at the house where we will be staying, so as long as I am there when something happens, I can step in as needed.

I will have to mow at some point in August. The sites are not out of control, but I still have a ton of work to do at three of the four sites.

That about covers it for this edition. I pray you all stay safe and well and enjoy what remains of summer!

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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