The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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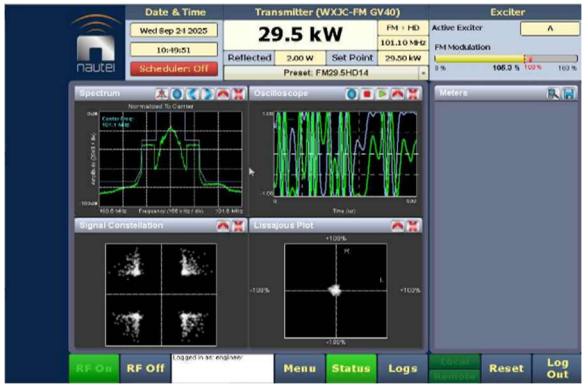
Progress!

It took more than three months, but WXJC-FM is now back up to full power on the (new) main antenna!



Regular readers will recall that the antenna took a lightning hit back in June, and the subsequent internal arcing destroyed the antenna and even got into the transmission line. We replaced the antenna back in July, but the 5-inch line was contaminated with soot even almost 20 feet below the connector. To get back on the air, we cut the line back to that point and inserted a stick of 3-1/8" rigid line and a new reducer. Because I was afraid the soot on the Teflon spiral would provide a conductive path for an arc, we limited TPO to 10 kW, which produced 38 kW or thereabouts of ERP, and that restored market coverage while we figured out what to do with the transmission line.

Five-inch line is just about extinct these days – we could get 5-1/2" line, but it would have to come from Europe and would take months to get and cost a king's ransom to get it to the site by container ship and truck. So instead, we opted to replace the top 200 feet of 5-inch line with 3-inch, which has ample power handling capability but higher loss. We got the spool of 3-inch along with hangers and hardware fairly quickly, but we had to wait on the tower crew, which was tied up until mid-September.

We wanted the ERI crew because of the delicate nature of the work to be done. They had to remove the new 6-inch EIA flange connector from the end of the 5-inch line very carefully so that it could be reinstalled 200 feet below. That connector was, as far as I can tell, the last of its kind on the planet, so… Also, when they made the cut in the 5-inch line 200 feet down, that cut had to be in the exact place so that after the connector and reducer were installed, it would mate up with the end of the new 3-inch section. And to add to the complexity, when they made the cut, they could not allow any debris, including and especially copper shavings, to get down in the line. It was a tall order (no pun intended), but they pulled it off.

An ERI tech was on hand with his VNA to do the final tuning of the antenna. His initial sweep showed a beautifully flat load with a VSWR of 1.04 on carrier. That's about as good as I've seen a tuned antenna, so I waived off additional tuning – there was nowhere to go but worse.

The point 200 feet below the antenna input where the new 3-inch line section is connected.

Todd brought the transmitter up, and with 29.5 kW forward, the reflected power indicated on

the Nautel transmitter was 2.0 watts! The mathematically astute among you may figure out that can't be, and you'd be right. The actual reflected power is likely more like 10 or 11 watts, but the line loss shaves some of that off and the transmitter's reflected power detector and amplifier circuitry is likely not very accurate or linear at that low level. Still, it looks mighty good on the screen!

The bad news from that site is that even with the new interbay section in place on the aux antenna, the aux system is still not functional. With 4 kW forward we were seeing 300 watts reflected, which translates to a VSWR of 1.8 and a return loss of 11 dB – un-good as Stephen Poole would say. A TDR shot of the transmission line shows some significant issues throughout its length with the worst of the trouble spots near the bottom. At some point, the next time we have a tower crew out, we'll get them to open up that 4-1/2" rigid line at those points for a look-see. Maybe we can clean it up and improve the situation somewhat.

In the meantime, we're looking at options to better protect the main system, including keeping it pressurized with nitrogen rather than dehydrated air.

One other option we're exploring is from Dielectric Communications, and it's called the RFHAWKEYE®. This system uses a through-line section ("coupling unit") and provides continuous remote real-time, time-domain system measurement and recording at full power. It detects, locates and warns of even minute VSWR changes or arcing in the transmission system. Considering the extreme difficulty and high cost of dealing with antenna and line issues on that tall tower, if we can catch problems before they burn the house down, that will greatly speed the time to get back to full power and normal operation after a lightning hit or other event.

In Detroit (or actually Monroe), the replacement tower for WRDT is going up as I write this. Mike will give you more details below, but the long and short of it is that after several months of planning, fabrication, pulling permits and doing excavation for new guy anchors, the new tower is finally getting off the ground, literally.

We expect the tower to be complete some time the week of October 4. Then the fun begins for us, starting with impedance measurements and a new MoM proof.

Haters Gonna Hate

We've all heard that sentiment, meaning that people of a certain temperament or disposition can't help but behave in a certain negative way. Sadly, we saw it play out in shameful ways recently in the wake of the Charlie Kirk assassination.

On the heels of getting the WXJC-FM main antenna and transmission line fixed and the station up to full power, I posted an AUI screen shot from the WXJC-FM GV40, similar to the one shown on page 1, on a social media broadcast engineers group page along with a brief "Thank God" message noting that the station was back up. I got a lot of good comments and reactions, some good questions and dialog, which was why I made the post in the first place. We learn from one another in forums like this.

WRDT tower 4 going up!

But then came a negative post out of left field: *"hay Chris looks like you are covering the stations above and below you with a HD jamming signal... hows the ROI on that HD ?"*

Seriously? I mean, the spelling and punctuation mistakes and what they say about the commenter aside… REALLY??

Initially, I thought that I shouldn't respond at all and even considered deleting the comment. But I just couldn't let it go. So I responded with this:

"Nobody anywhere near on either side, so NP there. As for ROI, it's hard to say. Like it is hard to quantify ROI on our AOIP infrastructure, playout system, Part 101 microwave network, digital audio processors, stream blades and every other part of our multilayer broadcast infrastructure. It's part of providing the very best listener experience on every radio, entertainment system and device. Anything less and we lose ground to everything else competing for share of ear."

The commenter's response? Crickets. I was a little disappointed.

I get it that not everyone is a fan of HD Radio. That's understandable. But… wow.

I guess haters are gonna hate.

The New York Minutes
by
Bill Stachowiak
Chief Engineer, CBC – Western New York

Hello from Western New York! This month, I'd like to provide a brief overview as to what has been going on in Buffalo from an engineering viewpoint.

I always like to maintain a good backup strategy so that I can recover from almost any emergency situation that might happen. I am of the belief that computers are always at great risk of failure. If you lose a hard drive, you don't want to be in a situation where you lose all of your data and configurations. I have always maintained backup images of all crucial computers so that I can easily get the system back online ASAP. I now have that in place. I have setup an 8 TB drive as a share on my engineering computer. I have all of the computers that I want to backup setup to backup to individual folders located within the backup folder on the shared drive.

Last month, we switched over to the PF-SENSE firewall with very little problems. We discovered that we had a few IP address conflicts, which we quickly resolved. In one case, we discovered that a device had a static address within the DHCP assignment range, and another device was assigned to the same address, causing a conflict. This was also resolved.

At the WDCX-FM transmitter site, we were losing nitrogen at a very fast rate. We did some testing and found out that some of the valves on the manifold were leaking around the valve stems. We replaced the valves to correct the problem. We will be completely replacing the manifold soon. We also added a pressure transducer so that we could monitor line pressure remotely.

We replaced the audio processing on the WDCX-FM HD2 channel with a new Omnia Volt. We had been using an old Omnia FM, and the Volt, configured for multicast HD processing, was a big improvement.

At the studio, we replaced the mic preamps and processing for the two production rooms with a Wheatstone mic blade. We had been using some older Symetrix analog processors, so this was a big improvement.

We were having a problem where the diversity delay on WDCX-FM was drifting. We discovered that we had phase lock unlock alarms on both exgine cards. After restarting the exgine and exporter, the alarms cleared and everything became stable.

In Rochester, WLGZ-FM is currently using an old Gentner GRC 2500 remote control. It is getting very hard to maintain because of the lack of support from Burk. We are planning to replace that remote control with a newer Burk ARC-16 that Cris is going to provide.

As I mentioned last month, computers have played a very important part in helping me be productive in spite of being blind. Here are some of the ways. I can read pretty much any manual that is in PDF or DOCX or TXT format. Even if the PDF is a scan, I can use optical recognition to convert it to text.

Also, with the event of talking systems like the Burk remote controls, being able to dial in to a site to check parameters has been a big help. I also have a talking VOM so that I can check voltages and resistances without relying on someone to help me.

Most modern equipment has a web interface of some sort that conforms to HTML5, which works well with my screen reader. I can generally do most configuration with no help.

When I started looking into Wheatnet, I discovered that Navigator wasn't easily accessible with JAWS, my screen reader. I contacted Wheatstone about this, and we worked out a solution using their ACI command line interface.

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

WRDT Tower 4 Reconstruction

Regular readers of *The Local Oscillator* will recall that an unfortunate accident on the property of WRDT 560's Monroe, Michigan transmitter site caused the catastrophic failure of the radio station's tower #4.

In brief, what happened was that an implement being towed behind a tractor planting soybean seed collided with the northeast guy anchor, causing all four of the turnbuckles to fail, which released the tension from four guy wires simultaneously. The tower collapsed instantly, folding and twisting down to the ground, landing partially on top of the tower's tuning house, and along the side of the creek that runs between it and the transmitter building.

Naturally, the tower was damaged beyond repair, but fortunately, no one was injured. You can read my original *Local Oscillator* article in The Motown Update: Click Here

Figure 1 - Unloading the new tower.

Since then, there has been a lot to do, and much work remains. As I write this, a new tower has been ordered and delivered to the site. A new base insulator and Austin transformer were also purchased and delivered. New steel for the guy anchors, lighting, and lightning protection was also purchased.

All six guy anchor points have been moved and completely recreated. The existing anchors were too damaged to reuse, and since digging them up would be costly and time consuming, the decision was made to simply rotate the guys clockwise and create all new anchors.

Monroe has a high water table and a relatively shallow layer of bedrock covered mostly in clay, so digging six new anchors was slow and tedious. Once that was done, ground water was pumped out, rebar cages were lowered onto standoffs, and concrete poured into the holes. This went smoothly, and the new anchors were allowed a week to cure.

There are 21 sections of tower, 20 of which are 20 feet in length. Each section is slightly different, tapering in size and using smaller diameter tubing as the tower increases in height. The top section is marginally shorter and designed to accept the crow's nest (lighting protection) and the top beacon fixture.

Figure 2 - That is one big base insulator!

The base insulator is gigantic, weighing in at a considerable 856 lbs.! Good thing I had Steve there to help me lift it! The reason it's so big is so that the tower will comply with the current ANSI/TIA-222-H standard, which includes two inches of structural ice, making the design weight over 200,000 lbs.!

Counter to my original belief, the entire tower will be assembled by a combination of three different cranes. I had envisioned a winch and gin pole being used to leapfrog sections to the top, then bolt them in place. At this point, the base insulator and the first two-hundred feet have been placed and their guy wires connected. This week, the really big crane comes onsite to finish the job; it needs to reach over 400 feet to place the top section.

Other Musings and Goings On

This year's inventory went smoothly, and we didn't have anything more than a few minor corrections to make. I stay on top of our assets by making additions and deletions in real time so that our list remains accurate and complete. Inventory lists are essential should we have a need to make an insurance claim.

Since we are not using our 560 AM daytime site in Monroe, we've been using this opportunity to make some changes to the networks and audio chains. It's really great not having to worry about staying on the air while making a material change in some critical signal path.

We were able to bypass some old homebrew audio switcher, a patch bay, and change out the main network switch. I'm respectful of those who came before me and their ability to make some custom device from parts – I've done it myself. However, keeping every signal path on things I'm familiar with is a higher priority than seeing just how long some homemade power supply and relay box will last.

Zetta has been working well. I have a good grasp of what does what, and what not to touch without support on the phone.

A recent change needed to be made requiring a couple of additional macros and two new routes to be created. The macros would reference the routes which control input on/off switching of a Wheatstone utility mixer (UMIX). This needed to be done to change the source of audio for one of our streams. I set off to do this by myself and quickly found that my network-based control did not work, which was baffling, because other network controls were working from Zetta to this very same UMIX. A quick call to Wheatstone and RCS Zetta support should make this work in no time. Nope. The problem is that when two company's systems interconnect, often there is a piece of middleware which translates commands and information from one company's language to the others. This middleware is helpful if not essential but often ignored after the two companies finish development. After that, there is scarcely anyone that knows how it works.

Fortunately, I was able to locate the one person who knew how to get Zetta to talk to Mixer 2 on Wheatstone's UMIX. Now I'm trying to figure out why everything works precisely as it should except on the actual day the macro runs in the log – HELP!

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

A Real Zetta Update

September has been a busy month here in Birmingham. One of the things that made it that way was a need for several of the music libraries that WDJC-FM and WXJC-FM have curated for their stations that needed to be shared with several of our other markets. In WDJC's case, the sheer volume of the music on our database for their CHR format is near 16,000 songs.

Behind the scenes, we needed a way to back up two different subsets of that music, a highly curated Praise & Worship format for one and a smaller Maranatha format for the other.

I can hear everyone now saying, "Well Todd, in Zetta, you can copy and paste those selections out to a desktop and it just starts to convert that audio on the spot so that you can have a backup of whatever audio you want." Certainly, that fact is true. The issue we discovered was that while the audio was named as <title>_<artist>.mp3, none of the actual metadata was actually in the audio that could be ingested in the markets that needed it.

In both the formats we were looking at, this would have required about 1,600 songs to be individually handled in the receiving system, for each market, and would have cost us likely 25 to 30 hours of work in each location. This is the 21st century, and there had to be a better way.

After some back and forth with RCS about the issue, it turns out that the latest version of Zetta their support technicians were on did not suffer from this problem. Their systems, when saving audio from their workstations to a site other than Zetta, carried the metadata with it in the backup process. Our original installed version was 5.24.1.489 and the newest version was 5.25.1.320. So, in order to save everybody a lot of time and energy, we began to look at scheduling an upgrade.

Fortunately, we caught a break with RCS and there was an open window on their bookings site (https://www.rcsworks.com/bookings/) for an update to occur on the afternoon of Monday, September 15th. The update schedules are normally about 2 weeks' time frame from the current date.

The process is pretty similar to how we used to schedule updates for Nexgen. They ask for a two-hour window of time instead of the one that you normally had to prepare for with Nexgen. All of that makes sense. You're working with a heavier database than Nexgen ever thought about having, and any time you update software, you have to account for the "Oh, that's never happened before…" that inevitably comes when software gets upgraded on your premises.

Overall, our upgrade actually took a little extra time as some of our machines didn't like the RCS upgrade tool and had to be strong-armed into taking the upgrade by manually forcing the executable file. At the end of the upgrade, we were able to backup audio and its associated metadata and allow several other markets to save time on the audio ingest side. There aren't very many times that I suggest updating software just for its own sake, but in this case, the upgrade had a clear purpose and saved a lot of effort for everyone.

WXJC-FM Tower Work Completion

I know I said that the month was busy, but maybe just a lot of work got crammed into one week.

On Wednesday the 17th, the ERI tower crew was back in town to finish the work on our WXJC-FM tower. Since their original visit, we had amassed a number of necessary parts and pieces so that we could not only get back to our FCC licensed power of 100,000 watts ERP on our main antenna, but hopefully fix an issue with our auxiliary Shively 6814 antenna as well. The "eagle's nest" at the top of our tower's top section had been lightning struck into submission over the years and a new one was ordered.

With all of that in mind, the crew got all their rigging done and started to work on the auxiliary antenna. This didn't take very long as the interbay section they were replacing was just above the power divider T-section and included the connection to the fifth bay of the 8-bay antenna. The hardest part for them was loosening the 4 bays below the power divider enough to allow for the older, damaged interbay section to be removed. That process ended up being about a 4-hour job, and the crew didn't want to start on the main feed line until the next day.

The issue with the main feed line, as documented previously, was that we were only able to remove about 15 feet of line from below the antenna and we still had some soot and contamination in the line even at that point. We had been running on an STA at 10,000 watts TPO since the beginning of July. Our fix was to purchase 200 feet of RFS HCA300-50J with factory-installed connectors and hopefully get below any of that contaminate travel to good clean line.

Figure 1 - The two ends of the 200-foot piece of 5-inch line we cut out. Note that the Teflon is clean and bright white in the bottom photo.

The phrase "measure twice and cut once" was coined for times like this. The crew had to remove the 6-to-3 inch EIA reducer connector at the top of the 5-inch section we were feeding into the antenna (the 5-inch line has a 6-inch EIA flange connector on it), connect and insert the new coax to the antenna, and then cut the 5-inch line 200' feet (plus the reducer connector) and reconnect it to the freshly cut 5-inch coax.

Added into the pressure was that if anything happened to the HJ9 connector that was being moved, we were really hosed as it is "unobtainium" at this point, probably the last one on the planet. The crew took their time and really got it right; all the calculating and careful cutting paid off. The 200 feet of 3 inch line introduced more loss into our system, so in order to get our full ERP, we had to ask the GV40 for 29.5 kw instead of the previous 27.2 kw.

At the end of the 12-hour day, after we had

purged the line with nitrogen and had begun to stage up our power, our GV40 could only measure about 3 watts of reflected power in our main antenna system. We're pretty certain that number is not entirely accurate. It's a long way up that 1,330-foot tower, but for reference, the GV40 was previously reading about 18 to 20 watts of reflected power when we were pushing 27.2 kw from it into the old antenna and line. The tuning sweep with ERI's equipment connected to the line revealed a VSWR of 1.04. We decided to accept that value without any extra tuning and back away slowly.

Finally, the crew swapped the old "eagle's nest" static dissipator at the top of the tower with a brand new one. The best way to visually describe the old one is consider a 30-inch ash tray where all of the cigarettes in it had been smoked down to the filters. It certainly did its job, but it was pretty used up.

At the end of the tower crew visit, we have a rock-solid main antenna system, but the auxiliary antenna didn't end up getting helped very much by the newly purchased interbay section, so it cannot handle the power that our main system can. So we're considering alternatives, including a definite one, which is to begin using nitrogen on our main antenna instead of the dehydrated air system we were using. The other is possibly incorporating a Dielectric RF Hawkeye into the line. The RF Hawkeye is designed to monitor any changes in the line and effectively shut things down to mitigate damage before it ever reaches a catastrophic level.

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

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

Like millions of others, I was saddened and horrified at the murder of Charlie Kirk, the founder of Turning Point USA. I wish I could say that I was astonished at how the radical left has responded, but they're as predictable as a falling stone. They've developed their own theory that the alleged shooter was a "MAGA Guy," in spite of reports that he's gay and had a transgender mate.

Victor Davis Hanson has noted that the people who cheered Kirk's murder, and then lost jobs, were genuinely shocked and surprised. That's because they live in a bubble, surrounded by people who only echo what they want to hear.

TPUSA will continue to do its good work and is growing exponentially. Tens of thousands have requested info and revival is breaking out. God has His plans and purposes, and He works all things to the good of those who love Him (Romans 8:28). I'm deeply saddened that Charlie died, but I do believe that God will indeed take that which was intended for evil and turn it to good (Genesis 50:20).

Bright Lights and Lasers

I had cataract surgery done several years ago; first the left eye, then a few years later, the right eye. If your vision is getting blurry, and especially if you see halos around bright lights, go ahead and get it done. Don't put it off. It's painless, and the difference is night and day. Choose a good ophthalmologist and gitterdone! You'll be fine.

My current doctor, the one who did my right eye, wanted to do some laser work on the older left lens. Figure 1 is what I saw before he came into the room. The bright white light was there just to help him find my head. (I could have pointed it out to him, but that wouldn't be scientific. Or medical.) The actual laser was bright green, punctuated by even brighter flashes when he'd zap something.

I mean, really bright green. So intense that I had a distorted moire pattern in my eye while he zapped away. It didn't take long and was also painless, but I was blind in that eye for quite a while. The super-bright laser was just part of it; the eye had been dilated as well. Try driving in Birmingham traffic with one unhappy eye sometime. It's fun.

AI Lawsuits

Last month, I mentioned Bartz v. Anthropic, in which the plaintiffs claimed that illegal copies of their works were used to "train" AIs. Anthropic negotiated a $1.5 billion out-of-court settlement. Given that the judgment could have reached the

better part of a trillion dollars if they'd lost at trial, they must consider that a win. It's still the largest copyright settlement in history and it makes me itch.

In another case, Kadrey v. Meta, the court ruled that "fair use" would cover an AI training on copyrighted materials, but it was a very narrow win for Meta/Facebook. The judge found that the plaintiffs had failed to demonstrate market dilution from Meta's action. In plain English, if you water down a creator's market in any way, you could be found liable and owe gobs of money. Then you'll itch, too.

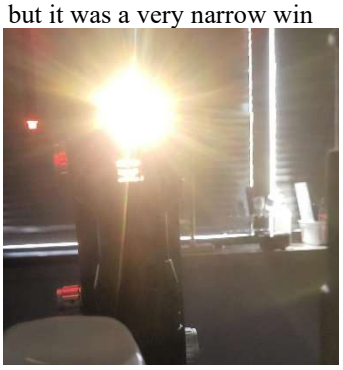


Figure 1 - The bright white light helped the ophthalmologist find my eyeball.

You might wonder why this matters to us. Remember how lawyers work: if Meemaw falls in a parking lot, they'll sue every business that touches that asphalt. They might even sue anyone associated with potholes, light bulbs and the ham sammich that Meemaw was munching as she tumbled. Simply put, it's not impossible that we could get caught in the crossfire of one of these "AI stole my lunch money" lawsuits, especially if we use AI-generated content.

As a side note, we've crafted our sites for Search Engine Optimization (SEO – because we desperately needed another acronym). Many website owners complain that AI search results are bypassing their hard work and won't even take the user to their website, so cue some more lawsuits. More fun.

General Thoughts: The "Cloud"

Distributed Denial of Service (DDoS) attacks have been increasing in recent months. You're having lunch, scanning your phone. Then the pages get sticky and refuse to load, or you get weird errors. Within a few minutes, it seems to return to normal. DDoS isn't the only thing that could cause this, but it's becoming a significant factor, especially for "Cloud" services.

There are old-timers in broadcasting who long for the days of red-hot tubes and turntables. When you tell them that many "cloud" providers have been hit with DDoS attacks, they wonder, "What's the big deal?" Here's the deal: our Intertech websites are actually hosted on Amazon Web Services (AWS), a popular target.

We're a radio broadcasting company, but our listeners are web-aware (if not web-addicted). They still listen to our air signals, thank the Lord, but they also want streaming, podcasts, reviews and ratings. Some advertisers no longer give a phone number on air; they promote their web address as a point of contact. Having an advertiser list on our station websites is also a selling point.

We may – I emphasize, "may" – end up bringing our servers back in-house. It's more work for us, but if we begin experiencing major outages due to the general orneriness of the gladsome, happy-making chaos that is "The Web/Cloud," offering a smaller target than Amazon or Google might be worth it. But there are downsides as well: see the previous sentence about "more work for us." You have to love it.

New Email Server

I'll want the assistance of our engineers and/or whomsoever is designated to help with this transition. We've had a tower on the ground in Detroit, a destroyed antenna system in Cullman, AL, and problems with the KLTT site in Denver (among other things). As a result, many of the key folks that I would have depended on for help have been tied up. Lotsa rope with even more lotsa granny knots. (And anvils, thumb tacks and glue.) But we're finally seeing light at the end of these tunnels, thank the Lord.

The framework for the new mail server has been done. See figure 2, and don't worry: the MariaDB gibberish is only shown here to give you an idea of what I'm doing "under the hood," as it were. I've created some custom admin pages to make it easier for our key people to add and remove users, edit distribution lists, and so on. So ... fear not: you

Figure 2 - Setting up an email forward in the new mail system.

won't have to go in and manually edit the database. I've done that for you.

You know that I, and not an AI, am writing this because I'll finish with a certified Stephen Whine(tm). The folks who build mailserver packages don't make this easy nowadays. To start with, the (relatively) easy-to-setup packages are disappearing. They've either been abandoned entirely, or they're pay-to-play now, charging about the same as Microsoft and Google! For another, the Internet has clamped down on private, in-house mail servers. You have to jump through hoops and swallow flaming swords to keep one running nowadays.

Let's add a descant to this fine whine: look closely at the MariaDB code at the bottom of figure 2. You might wonder why I'd need to insert the incoming and outgoing domain names separately. They're embedded in the email, aren't they? One reason is speed: looking for a specific domain name can be done quickly. MariaDB has ways to do "wildcard" searches, but they're slower. This matters when you're handling multiplied thousands of emails.

I've also found in my own programming that "@" (the "at" symbol) is an illegal character in some web applications. There are ways around this. For example, you can specify the numerical value for the character in a URL; that's the "%20%40"-looking gibberish that you sometimes see in your browser's address bar. Easier just to split up the email string one time when you edit or add a user, then store the domain name(s) separately.

That's enough for this time. Pray for this nation, and pray for Charlie Kirk's family and for TPUSA, and thank the Lord for revival!

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

Earlier this summer, we transitioned from Nexgen to Zetta as our audio playout system. For the most part, this has gone very well.

One of the things that did surprise me was that the Zetta software didn't include the ability to directly work with our Sage ENDEC EAS equipment through IP communications as Nexgen did.

I guess I was surprised since Zetta was also an RCS product. So, for years, we have been sending test and forwarding alerts, almost automatically, through the IP communication of Nexgen.

Instead, with Zetta, we have to use relay closures through the Zetta-to-Wheatnet infrastructure to initiate weekly tests. Relaying monthly tests and actual alerts would have to handled differently.

For the three radio stations that had their EAS ENDEC located in the same suite as the studios and the Zetta and Wheatnet systems, this was fairly easy. Once the logic was connected between the three systems, an audio file with embedded cue points was used in Zetta to initiate the test. Using an embedded command in the audio file, you can place a relay closure to run at the precise time you want it to occur within the playout of the file.

We were able to adjust for the three stations rather quickly during the transition. However, for the fourth station, which is located 100 miles away, and having its ENDEC located at the transmitter site, there were greater difficulties.

As stated earlier, we crossed this distance through the Internet with IP communication between Nexgen and the ENDEC at the transmitter site. Since we use Tieline codecs to send audio to and from the transmitter site, the obvious choice was to use the built-in relay features of the codecs.

At the studio, we would use the Zetta-to-Wheatnet-to-Tieline infrastructure to get the relay closure to transmitter site and subsequently the ENDEC. Since our Tieline Gateway 8 codecs have Wheatnet cards in them, they not only show up in Navigator as sources and destinations for audio but also have LIOs doing the same thing.

I tried to get this to work, but I never could. Eventually, I punted and just used a physical wire to translate the relay closure from Wheatnet to the Tieline. After all, I would have to do this at the transmitter site anyway. This got the closure from Zetta to Wheatnet to the Tieline, and then at the transmitter site from the Tieline to the ENDEC. It all worked well once I gave up on the Wheatnet LIOs in the Gateway at the studio.

I had something that would allow me to initiate the weekly test from the studio to the transmitter site where the ENDEC was located. Even from the Zetta playout system. But there was more to it than just that.

I had another hurdle: time. With the other three stations, the ENDEC interruption was located along the audio chain before the profanity delays so that when the audio played, it was in sync with real time. So, when the Zetta audio file announcing the test played and then fired the test, it was all in sync. The audio file had sufficient silence located at the end of the file to cover the transmission of the tones. It would interrupt the audio chain for the test but not any other audio.

If we did this with the fourth station, the Zetta file would be sending the relay closure in real time, but the audio would have a delay of 20 seconds for the profanity delay; it would all be out of sync. Not good because it could be interrupting commercials if the EAS audio file was played at the end of a spot block, which they usually are.

The good thing about Zetta is that you can place the embedded closure at any point along the length of the audio file. I simply needed a long enough file to place the closure at a point that would sync it fire off when audio file was actually playing on the air at the transmitter site.

Maybe not "simply"… there was the 20 second profanity delay to deal with, but there was also the buffering of the audio and encoding/decoding latency on the Tieline codecs. So it was a trial-and-error adjustment to get it exactly where I wanted it.

I chose to make the file a "donut" with the opening announcement and a closing announcement at the end. Instead of just having silence in the middle of the file, I place a low-level bed to prevent local silence alarms from going off. The studio would not be experiencing the ENDEC audio on any devices monitoring the audio along the local audio chain. The operators can monitor the ENDEC audio on the return audio from the a monitor that is fed the transmitter signal.

With minimal adjustment, I got the results I wanted. The tests sound like they are being generated at the studio. Much better than just randomly interrupting other audio. We still don't have this kind of control over the monthly tests and actual alerts, but I am working on it.

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

Mowing

I was finally able to get out to the KLZ tower site and mow at the tower bases. This year has been a mixed bag for mowing. This site didn't grow up as badly as in years past. I had half the towers about overgrown, and the other half were just fine.

Kubota Trouble

The Kubota tractor has been giving me grief. There is a forward/reverse safety switch that's difficult to get to, located underneath amid a lot of moving parts. We assume it's gotten dirty – after all, mowing conditions tend to be very dusty, and the switch is original to the tractor, so it's 11 years old.

The way it worked, I would need to get off the tractor to do something, typically I would have the push mower and string trimmer in the bucket, so I'd stop, put the parking brake on, turn it off and hop off. When I was done with that, I'd get back on, try to start it, and… nothing. Not so much as a click.

Sometimes, when I would leave it running when I got off, I could hear a high-pitched whine, and I have since realized the noise is the same that's made when the forward pedal is slightly pushed. Thankfully, this is how I figured out it was this safety switch. We were able to get it cleaned up and working again.

We had Kubota come out and service the tractor for us. They looked at the switch and in true form, it was working fine. We'll have to keep an eye

on it. Now we know how to access it to clean it up if the issue comes back, and we know who to contact to come out and replace it if we need that done.

KLTT Cable Project

We got started on getting new control and power cables run to towers one and two at the KLTT tower site last month. The electrical contractor was able to get the trench done in a couple of days. Then they installed the conduit and backfilled.

We had to wait a week and a half for the control cable to arrive. Once it arrived the electrician came back out and pulled the cable in the conduit from the towers to the canal.

We are now waiting for the canal to stop running for the season. Once that happens, we'll rent an excavator to help us dig a trench down and across the canal to put the rest of the conduit in and then run the cable the rest of the way to the building. We're just praying that the existing control cables hold up until we can get this done in October sometime.

Looking Ahead

As I look ahead, the year is quickly coming to a close. The mountains of Colorado have already experienced the first snow of the season. Leaves are beginning to fill my yard as they fall off the trees. While I love spring and summer: the beautiful green, the flowers, the smell of freshly cut grass, but with fall comes beautiful colors for a short time followed by barren trees, grass that goes dormant, flowers that die off then snow and cold.

I hope to do some more mowing, but we'll see. There is still some growth that should be knocked down, not that any of the growth is where it'll cause issues for us. But, let's face it, there's something calming about looking at a transmitter site property and seeing all the growth knocked down.

As I have already mentioned, I hope to get the project at KLTT finished at long last. This will be a huge weight lifted once it's done.

The trench with the new conduit, power and control cables to towers 1 and 2 is backfilled and done.

I think that about covers it for this edition. I pray you all stay safe and well!

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

Crawford

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