The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

JANUARY 2025 • VOLUME 35 • ISSUE 1 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR

Power!

Starting in mid-November, we received several notices from Southern California Edison (SCE) that KBRT's Oak Flat transmitter site would be without utility power for a two-hour period on November 25 so that SCE could "upgrade equipment." We were well prepared for this outage. Our generators' fuel tanks were mostly full, and Todd Stickler exercises the connected generator every Thursday. So when the power went out on the morning of the 25th, the generator started, the transfer switch connected the site to the generator's 480-volt three-phase output, and the station stayed on the air.

The first indication of trouble came an hour and a half or so later. I got another email from SCE advising that the work was all done and our power had been restored. I immediately hit the KBRT remote control system and saw that the Generator Power status indicator was lit red – if we were back on shore power, the status indicator would have been green and the status text would have said "Edison Power." I didn't think too much about it at the time, figuring that I had checked too soon and that we were still within the time delay on power restoration, which keeps the gen from shutting down too soon if there is a momentary restoration of power that doesn't stick (which sometimes happens).

But over the next couple of hours, I continued to check that status and it remained showing generator power with a red indication. I got on the phone with operations manager Todd Stickler and told him about it, advising him to submit a trouble report with SCE. Was it possible SCE had restored power and didn't know that our site was still down? So Todd did submit an outage report. It was not long after that we got another email from SCE telling us that power would be restored on December 7. What? WHAT?!? December 7 was ten days away! Surely that was a mistake.

As time went on, it became clear that it was no mistake. Power remained off and we got nothing but crickets from SCE. Todd tried and tried to get in touch with someone – anyone – at SCE that could tell us what was going on. It was not until more than a week later that he did finally get in touch with a real person who told him what we had about figured out on our own. SCE had pulled that piece of equipment, which was probably a transformer, with the intent of replacing it but found some other issues with the infrastructure which they did not have the materials on hand to fix. I heard the same thing through the site manager grapevine, so confidence was fairly high that this was in fact the case.

Cam Lock Connections from the generator

During that ten-day period that we were on generator power, Todd and transmitter contract

engineer Mike Duffy took turns going to the fuel depot every other day, picking up three 55-gallon drums of red dyed off-road diesel, hauling it up that five-mile switchback dirt track up to the site and pumping it into the main generator tanks. It took two refueling trips every other day, 165 gallons per trip, to keep the generator fueled. We figured that we were burning an average of three gallons per hour, 75 gallons a day.

The generator connection to our building and transfer switch. The small connection is the control wiring for start/run/shutdown.

On the afternoon of December 7, at long last, shore power came back on and our generator was able to shut down. Mike Duffy made one last refueling run, topping off the tanks and leaving some extra fuel in drums at the site.

That reprieve, however, was short lived. Just a couple of days later, SCE did a public safety shutdown for a couple of days. Fire weather had set in, and we all saw news coverage of the wildfire in Malibu. SCE wanted to avoid sparking a fire in those tinder-box dry, super windy conditions. We get quite a few of these public safety shutdowns a year. Utility companies took to heart the lessons learned from the 2018 Camp Fire in which some 85 people lost their lives and more than 18,000 structures were lost. Pacific Gas & Electric was bankrupted by that awful fire, which was sparked by its distribution lines during a fire weather event. And just a few years later, the Marshall Fire right here in the north part of the Denver Metro area destroyed the towns of Superior and Louisville in Boulder County, killing two and destroying almost 1,000 homes. A sparking Xcel Energy distribution line is strongly suspected as the cause of that fire. So who can blame these utilities for being proactive during fire weather events?

Thankfully, SCE restored power a couple of days later when conditions improved, and we were able to get our generator service tech up to the site to do an oil change and full inspection of the main generator, which had run a lot of hours continuously over the prior two weeks. He also did a load bank test on the backup generator, which we hold in reserve. The newer backup generator has the same capacity as the older main (70 kW), but being newer it has tighter emission controls, drinks DEF fluid and will shut down if loaded to capacity. The main will run the site at full power (with MDCL) without issue; we have to reduce power a bit if we're on the backup.

All's well that ends well. We went through some 900 gallons of diesel, which cost us several thousand dollars. We usually spend right at $200 per day to power KBRT from utility power; running on generator power costs us about $300 a day, not including our expenses in hauling fuel to the site.

This long-term outage cemented in our minds what we already knew – generator power is *primary* at that site. We can't look at our generators as backup equipment. Too often, they are all that stands between us and being off the air for days on end.

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

Hello to all from Western New York! Not long after last month's report went to press, western New York was hit with several lake effect snowstorms which dumped several feet of snow just south of Buffalo. The storms were broken up over several days, and in the end, we saw well over four feet at both our transmitter sites in Hamburg and Boston, New York.

Luckily, we did not experience any loss of commercial power at either site, although we were prepared in case power was interrupted. Both generators were thoroughly checked out before the storms hit and deemed ready for service if called upon.

John Gleason, our snow removal contractor at the Boston transmitter site, did a fantastic job keeping the access road cleared of snow, just in case there was an issue, so I could enter the site with no problem. At the Hamburg transmitter site, I performed the plowing duties with our new John Deere tractor, which did so much better than our previous Kubota tractor. The additional horsepower made all the difference in removing such a large amount of snow.

The majority of December was filled with getting our transmitter sites ready for the long winter season. I got started a little late this year, taking care of other issues that cropped up in late November/December, which put me behind somewhat.

The days leading into Christmas, we had a couple of issues, both at our Rochester stations. On December 23rd, our STL at the WDCX(AM) failed during the early morning hours. I had Earl Schillinger, who lives in Rochester, go over to the WLGZ transmitter site and be my eyes to determine just what caused the STL to fail. Everything looked good there, so he went to the WDCX(AM) transmitter site to check out the equipment located at tower #4. He noted that the DSP-6000 digital decoder showed constant faults, therefore we surmised that the decoder had failed. We have a spare set on hand, so I had Earl travel back to the FM site while I went to the AM site. That way we could swap out both the encoder and decoder at the same time to get us back up quicker.

When I arrived at the tuning house at tower #4, I noticed that the Moseley PCL6020 had no signal. A quick swap to our standby receiver got us back on the air. I will have to send the failed receiver to Kevin Winn at Winntronics to get it repaired.

The other issue we experienced was the loss of audio at the WLGZ transmitter site late that same night. I was unable to get into the equipment at the transmitter site remotely, which meant that a reboot of the cable modem and router would be necessary. I sent a text to Mark Shuttleworth to see if he could make a quick run to the transmitter to perform the reboot. Mark replied that he was in Michigan visiting family for Christmas, so he could not respond. I then phoned Spectrum support to have them perform a reboot of the modem to see if that would take care of the problem, which it did not.

At this point, I had been up nearly 21 hours, and did not feel comfortable making the 90-mile trip over to Rochester in the wee hours of the morning. After getting several hours of sleep, early Tuesday morning I went and got everything rebooted and WLGZ back on the air.

Somewhere in my garage, I have an old Middle Atlantic RLM-15-1C remote control closure switch, which can connect to our remote control. This way I can remotely perform a reboot whenever needed, alleviating a trip over to do so.

In January, Josh Myers and I will be busy going through NexGen to get everything prepared for the upcoming transition to Zetta, which is tentatively

scheduled sometime in March/April. I am sure that there are items that need to be deleted from storage that are no longer needed.

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 have a Happy New Year!

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

TRE+ = The Radio Experience

This month Crawford introduced TRE+ to WMUZ-FM in Detroit. TRE+ enhances RDS, HD Radio program service data (PSD) and HD Radio Artist Experience (AE) by dynamically looking up artist data and normalizing it by fixing punctuation, spelling, and other nuances to make the data presented to the listener more consistent. It also looks up and pushes artwork for each song that's played. We will be using TRE+ to allow us to interleave these messages and images with those for advertisers who opt to add it to their contracts.

Setting this up was not overly complicated but we did run into a snag when we attempted to use the program's own default folder as the export location for the automation system's now-playing data. This confused the program greatly as it attempted to read all of the xml files present in that location. This created a debug log that was many gigabytes in size in just a few hours, which caused it to crash. Once BE realized what was happening, they relocated the output of the automation system to a dedicated folder which solved the issue.

Running conduit from the rack to the GV40 for the RDS coax.

WMUZ has been using MPX over AES for 5-ish years now, which relegated our RDS to being created inside the audio processor. To regain dynamic RDS we bought an Inovonics INOmini 704 RDS encoder and fed its 57 kHz output into our new Nautel GV30 using its SCA input. The composite audio signal or MPX is fragile and must be handled with care since it can be affected by group delay, phase shift, and noise intrusion. This is precisely why delivery via AES at 192 kHz is so desirable. Absent a way to add RDS from the INOmini into that AES digital signal, it was important to locate this encoder near the transmitter and to use very high-quality cables keeping them as short as possible.

Unfortunately, those Leitch 75 Ω cables were too large to fit in the existing already stuffed rack to transmitter conduit, so we installed an additional 1-¼" HydroMaxx flexible PVC pipe into the incredibly tight space available there. The setup is completely ready for the sales department to offer it to our clients.

Alarming Local Mandate

Sometimes it feels like there is a force at play that makes certain problems happen at the worst possible times. Recently I was taking a couple of days off when Everon (the new name for ADT's commercial security division) called to alert me that a ceiling smoke detector was reporting an alarm at our studio facility. Thankfully, it turned out to be false.

When I returned to work, I received a letter from Everon talking about "jurisdictional alarm mandates." I hadn't heard of this, but it is probably not a new idea and may already be regulation in your area. You ought to check with your alarm monitoring provider too, because this has real and costly aspects to it.

Jurisdictional alarm mandates are essentially a way for municipalities to reduce the number of false alarms they respond to. I get it. My son is a firefighter and the last thing he wants to do is to find

himself at false alarm when a real emergency requires his attention. The letter essentially says that Everon and every other alarm monitoring company covering the City of Detroit must confirm via an eyewitness that an actual emergency is taking place prior to requesting dispatch of emergency services such as police or fire.

What patently disturbs me about this is that there is no mention of how Everon will respond to alarm trips where they cannot secure such confirmation such as unstaffed locations, or a burglar alarm at a house where the occupants are away.

Many broadcasters have read recent articles detailing copper theft and even drug activities at their remote mostly unattended transmitter sites. As this reads, without eyewitness confirmation, police would not be dispatched to a site with an active alarm trip. This dramatically increases response times which will in the long run result in greater property loss and potential loss of life.

Hopefully the monitoring company will dispatch an alarm at the direction of their user whether they be onsite or not, but this assumes that they are able to contact that person and that the person remembers their passcode. If not, Everon has decided to "partner" with local patrol services for which you will be charged an additional $14/mo. to make matters worse. At least you get two "free" patrol service dispatches per site per year before being charged $83 for each. I assume it was intentional when they listed these prices with two $$ dollar signs.

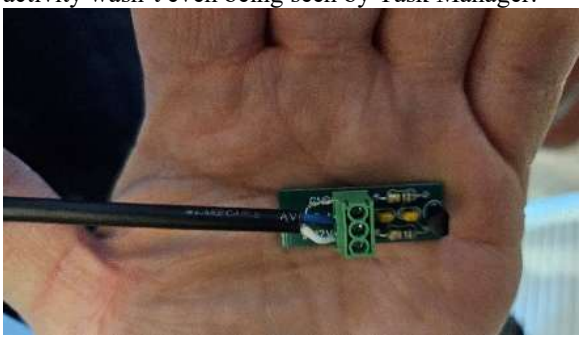
A fire doubles in size every minute; thieves can vandalize and loot property in a flash. This letter effectively has "bad ideas" written all over it.

The Wreck of the Prod 4 Workstation

Generally, a computer crash is ugly. The user is unhappy, data has been lost and much work must be repeated. Fortunately, this one did not have these attributes – the misery was completely fresh.

It started with a click in the audio. Our studio computers all use AOIP, and I recalled dealing with this on another occasion for which they provided a software patch and some additional tweaks to try. Everything else seemed rather normal on the machine. After installing the patch and tweaking as directed, I started noticing abnormally high drive access. Checking Task Manager, I couldn't see what process was at fault. In fact, the drive usage seemed normal, only a few percent, but the light on the system case told a different story. So did the performance of the computer: dead slow.

These kinds of issues aren't too uncommon. Sometimes the anti-virus software is scanning the hard drive, sometimes there are sixty tabs open in the user's browser, or way too many unused or unnecessary programs starting up at boot, but that wasn't the case with this user. Remember, this activity wasn't even being seen by Task Manager.



This tiny Sine Systems temperature monitor will keep an eye on HVAC supply temp.

Nonetheless, I kept Task Manager open and sorted by disk activity. I noticed that one process that I didn't recognize was hovering toward the top of the list and started researching it online. This native Windows process has at least some history of doing this very thing, and the article suggested a few ways to solve the problem. Stopping other processes, limiting Windows file indexing, killing services, etc. – I tried them all, and ultimately, I ended up with a computer that would no longer boot. No safe mode, and troubleshooting options just led me in circles. Nothing worked.

Windows and Dell both have recovery options, neither of which worked and took excessive amounts of time to complete. One of these was kind enough to offer a file backup, which did work, even though it took overnight for it to finish.

After making the file backup I reinstalled Windows 11 from the Windows 11 USB stick, ran updates, skipping 23H2, reinstalled drivers, programs, and restored the data. This probably took two to three days of work all told just to get the user back to where he was before the issue appeared.

Temp Monitoring

After having an issue with our new HVAC unit in the WMUZ-FM transmitter room, I decided I needed to keep an electronic eye on its output temperature. For this little job, I bought a tiny Sine Systems temperature sensor. It's a low-cost bare circuit board design, and can be ordered with a power supply, which I recommend. Even though it, too, is a low-cost wall wart style supply, any variation of the

supply's voltage will introduce an error into the unit's output, which is 10 mV per degree Fahrenheit. The sensor hangs directly in the HVAC supply airstream with just one small hole drilled into the ductwork for the wire.

With this little sensor in place, I can use my Burk ARC Plus to graph the output temperature of the unit. Cool (or hopefully not hot), eh?

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

Some New Year's Inspiration

For better or worse, I tend to see myself most clearly in the Apostle Paul's writings. This year I'm really leaning into Philippians 3:12-14 which says, "*Not that I have already obtained all this, or have already arrived at my goal, but I press on to take hold of that for which Christ Jesus took hold of me. Brothers and sisters, I do not consider myself yet to have taken hold of it. But one thing I do: Forgetting what is behind and straining toward what is ahead, I press on toward the goal to win the prize for which God has called me heavenward in Christ Jesus.*"

These words are pretty encouraging to me. Whatever I have been, whatever habits I've picked up, I can forget them, press, and strain forward to what God has called me to do or be – today, tomorrow, this year… Lord, help me to do that very thing this year.

Engineers are a different breed, for sure, and I hope this resonates with you to move forward and make the best out of the time we have here with the gifts God has given us.

PfSense, Almost Wrapped Up

It's funny how each Crawford Media Group market has presented different challenges installing PfSense. I guess I can always thank God for allowing me to have the installation "experiences" I've had, but I wouldn't mind a softball down the middle every once in a while.

This month's experience in our Buffalo market actually went pretty flawlessly, thanks in large part to Josh Myers, CBC tech extraordinaire in that market. Buffalo has one WAN and three LAN networks, so I created a PfSense configuration file for them based off of that network environment.

Josh got everything installed and uploaded the file, and when he swapped his ethernet cabling over to the new install, the internet worked on one of the LAN networks, but not to the other LAN – what in the world?? – the rules for WAN access from the LANs were identical (minus the obvious subnet differences).

After going through all of the settings, nothing jumped out at me as the problem. Josh moved back to their ClearOS box for the weekend.

Unfortunately, Josh determined that their Wireguard VPN wasn't working and had to brave a classic Buffalo 10-inch snowfall to get to the station on Saturday morning. We ended up troubleshooting a little more and still couldn't determine what the issue was that was keeping the one LAN from accessing the internet.

And here comes the sucker punch: Josh's kids had come with him to their studio and had their tablets with them. Stop reading for a second and hazard a 50/50 guess as to whether they had internet access on their tablets on that troublesome LAN? The answer is, "Why, yes, yes they did." They could access the internet wirelessly on their tablets on the LAN that nothing else in the building could. NONE OF THE PREVIOUS SENTENCE WAS A TYPO.

I have yet to figure out what the anomaly is there. The Christmas and New Year's holidays aren't allowing good scheduling, so we'll get back to it after things settle back down.

I also helped Rick Sewell in Chicago clean up a small nagging issue on his PfSense firewall. The issue was a MeshCentral (a remote machine access server) instance that was on the same LAN as a number of machines that needed remote access and had been setup on the server.

Rick has MeshCentral setup with dynamic DNS so that some internet active tower and employee

machines that are outside his local studio can be accessed as well, if necessary. PfSense wasn't allowing the machines that were on the same local LAN to see the MeshCentral server (i.e. the machines had to go out to the internet to see where his server was, which came right back to the same LAN their packets had just left), and the firewall didn't like that at all.

The solution was to craft a couple of complex rules on the firewall that would let the local machines have access to that local server. Once I understood the nature of the problem and could

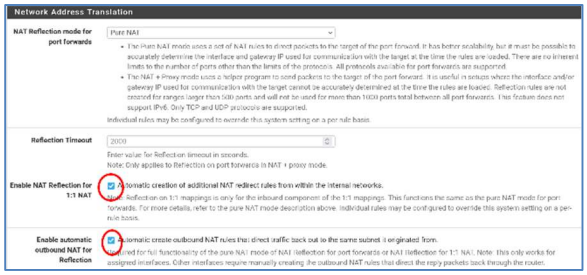


Figure 1 - Allowing NAT reflection and some really good explanations about what the choices actually do.

properly frame a google search, I was able to simply tick a couple of boxes in the "System>>Advanced>>Firewall&NAT" settings on PfSense.

As soon as those choices were ticked and the settings were saved, Rick's machines on that local network were able to be accessed again just as they had previously.

If you are having similar issue, these settings are what will allow the NAT to "reflect" the traffic back to its origin.

One thing I do love about PfSense is that it is fairly well documented (https://docs.netgate.com/pfsense/en/latest/), and even the individual choices you have within the firewall give a fairly comprehensive idea about what outcomes those choices will produce.

Getting Certified

As we get into the new year, I'm looking forward to getting RCS Zetta installed and working. We're expecting to transition to the new radio playout system in March. In the meantime, the company paid for some Zetta training and certification courses.

The courses are a set of videos that explain the new software, their new terminology, and how to set it up for both users and engineers. Each video element has a knowledge quiz, and each complete section has a final quiz.

It is certainly well worth the time and energy spent to see how much different this RCS parallel product is from the original and how much it is actually the same. I liken it to the same difference you might have felt when you finally made the change from Windows 98 3rd edition to Windows 7 – you had to spend some time learning how to do things in the new GUI, but in the end, the experience was way better, all of the changes made sense and you ended up being more efficient.

Upon completion of the video training series, I'll be able to include the "Zetta Certified" and "Zetta Certified Engineer" to my email signature. Of course, at that point, none of you will be able to tell me anything, but more importantly, I'll be ready for the transition to Zetta and to train everybody in how to use the new software.

Cris said that the field installer will be on site for about three weeks, and I'm sure we'll be ready with our best what-if scenarios.

Until we visit again in these same pages next month, have a great beginning to your 2025 and may God bless the work of your hands.

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

I hope everyone had a blessed Christmas. For the first time in many years, I didn't travel; I stayed home. I don't know if it's the bad economy or what, but Alabama pretty much shut down for Christmas this time. Even the Waffle Houses and Dollar General stores were closed, no doubt resulting in much madness and gnashing of buck teeth amongst rednecks. The Chinese joints were open (as always), but the one near my home has trouble maintaining a sanitation score higher than my shoe size, so that was out. Instead, I made up a huge pot of homemade soup. I just relaxed and thanked God for the day!

December is usually a bit of a slow-down for most of us. I worked on several projects. The biggest two were finishing up the SNMP-on-Raspberry-Pi stuff and prepping for our new mail server software. Since most of our readers are technical folks (including those of our staff and partners who help their coworkers with computer issues), I decided to devote my first article of 2025 to email client set-up.

Note: this new email system isn't for those with Crawford Media Group addresses, which are hosted on Microsoft's M365 server(s). This is for crawfordbroadcasting.com and our other station-based domain names.

Der Basics

Those who live under a flat stone and scream gibberish at clouds may not have heard of email, but just for the record: the "e" stands for "electronic," so ergo, "electronic mail." It has been around for a LONG time; many decades. It was originally developed for plain-text inter-office communications. With the rise of the Internet, it rapidly expanded ... and then exploded. It's everywhere now.

A number of protocols for handling email have been developed and are published in what are called "RFCs," or "Request(s) for Comments." It's fitting that a "request for comments" could then become rules without changing that "RFC" handle, but that's just part and parcel with the happy madness that we know and love nowadays.

In other words: if you have trouble setting up email on your smartphone, don't feel bad. You are not alone.

One big problem is that the RFCs aren't always "Authoritative" (to use Geek Speak). There are gray areas, and software developers can (and do) interpret them differently. There are two forms of rules: "SHOULD" or "MAY," and "MUST."

If a system's maintainer chooses to implement a "SHOULD" feature differently from others, it can cause problems. In a nutshell, this is why setting up your email client isn't always a straightforward process. You may have to experiment. Now let's examine some more acronyms, starting with ...

SMTP

This is how outgoing email is sent. The Simple Mail Transfer Protocol was originally released with no encryption and no validation of the sender. When mail moved onto the Internet, spam and malware required better security. This was added in stages, sometimes haphazardly.

The worldwide standard port for SMTP is 25. When you receive email from third parties, it will invariably come in on this port. Our system has a Barracuda Spam Firewall on that port with the main email server to (hopefully) (sometimes) stop unauthorized users and spam. If it decides that a message is legitimate (or whitelisted), it's forwarded to our mail server internally on that same port 25.

The two ports commonly used by a client to send email to our server are 465 and 587. The first offers Transport Layer Security (TLS); the latter requires it. Our server will not accept unencrypted communications.

Tip number one: when setting up your OUTGOING server, try both port numbers. If you're trying to connect to an older SMTP server, you may have to use port 25, but with TLS enabled. Look for an "SSL" or "TLS" option on your setup page.

POP/POP3/POPS/POP3S

... stand for "Post Office Protocol;" the "3" refers to version 3, and the "S" indicates that it's secure (using TLS encryption). The original POP port number is 110, the encrypted POPS uses port 995. Same as with SMTP though, some servers are set up to use 110 but with encrypted communication. Click the "TLS" or "SSL" option in your configuration to ensure this. Again: our server will not accept unencrypted connections.

Post Office Protocol has been kind of "deprecated" (another lovely Geek term) nowadays, but many still use it (including yours truly). The original POP arose during an era when people typically dialed up for an Internet connection, checked their email and then moved on. This was also back when a 10 Meg hard drive was considered extravagant, so the email was not kept on the server. Your email client would download all messages and then delete them from the server.

Nowadays, you can configure most email clients to not automatically delete POP email from the server. I have POP on my smartphone set up this way. Unless and until I delete the email from my phone, it remains on the server. Then when I get to my office, I fire up my email client (Thunderbird) and can permanently move the email to my primary computer. I then have a local copy (which is another reason why I prefer POP, though you can save local copies even with IMAP).

This can be tricky. If you use default POP with "delete from server" enabled, downloading an email on your smartphone will remove it from the server. When you get back to your desktop and start Outlook or Thunderbird, that email won't appear in the message list ...

... or vice-versa. I can't tell you how many times I've accidentally left the email client up on my desktop computer, which checks every few minutes for new messages. It will pull in all available email each time, and it may delete the email before my phone ever sees it. Forewarned is better than four arms ...

IMAP/IMAPS

This stands for "Internet Message Access Protocol" and was created to replace POP. Same as with POPS, the "S" version is encrypted by default. The original IMAP port is 143; IMAPS is at port 993 (one of those odd cases where the newer protocol has a lower port number than the original; POPS is at 995).

By default, IMAP leaves all messages on the server. You can configure it so that your client is able to remove them from the server when you delete them in your client (for example, when you slaughter the spam in your message list).

As you can see my example in Figure 1, you still need SMTP for send. But IMAP is intended to allow you to manage your email, including the arrangement of different folders. The biggest advantage is that you can view and recall your email on any client – smartphone, tablet, desktop or laptop.

The two very real disadvantages are (1) you must have an active Internet connection to view your email and (2), while hard drives and SSDs are cheap nowadays, your server nonetheless can't provide unlimited storage. That's why you might get an aggravating "your mailbox is full" warning.

When setting this up in any email client, from smartphones to laptops, again, make sure that "SSL" or "TLS" is enabled. Our server will not accept unencrypted connections. (Have I repeated that enough?)

For Example (Figure 1)

This is from my Thunderbird email client. When I started, it offered to set up all of the usual suspects: GMail, M365, and so on. I clicked "Other" for our mail server. As for the automatic setup, feel free to try it, but you may have trouble, especially on smartphones. I selected "manual" for this example.

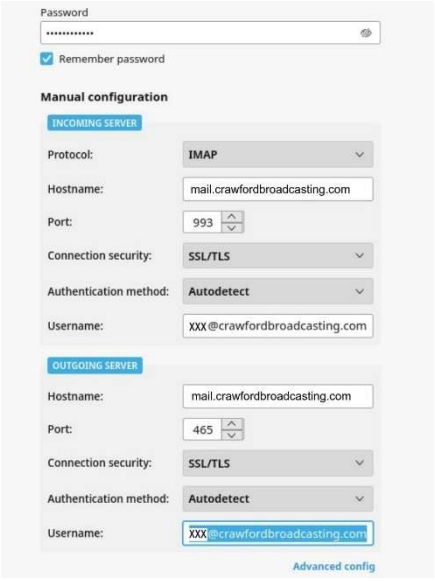


Figure 1 - An example setup for my Thunderbird email client.

From top to bottom on Figure 1: you'll see my password at the top. Incoming and Outgoing servers almost always use the same password; the

rest of the setup is shown below. One reason why I use manual setup is because there's a bug in Thunderbird's auto setup. It trimmed the "mail" off the domain name (but left the period – ".crawfordbroadcasting.com") and I had to correct it.

Check for things like that, and carefully review the port numbers and other selections. In this example, I'm supposedly setting up IMAP at port 993, even though I actually use POP. For those who care: the reason is because I've had trouble on my smartphone with IMAP suddenly flooding my phone with a zillion old, previously-deleted messages. This bug may have been fixed by now; I suspect it was caused by the fact that Google caches all email internally. (Something to keep in mind for privacy/security reasons, too, by the way.)

Finally, I'll observe that anytime you see "S" for "Simple" in front of an Internet protocol, your first inclination should be to grab your helmet. It'll be anything but "simple." Successfully setting up email can be done, but don't be surprised if you have to tinker and test. Todd, Jack and I, and Amanda in Denver, will be on hand to help when we, Lord willing, switch over to the new server this month, but we'd appreciate it if local staff could help vet simpler problems first.

Until next time, keep praying for this nation! God's got this!

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

New Remote Broadcast Equipment

We do have a number of regular remote broadcasts in our market. It can vary from month to month, but it is often an integral part of sales campaigns.

We have been using the Telos Zephyr codec models for a long time, over 15 years now. It was time to replace them with something newer, especially the units that were used outside because they showed the beatings taken over the years. The Zephyrs have been very reliable, and the Transversal Server seemed almost flawless.

However, since we became a mostly Tieline facility for STL equipment and the Tielines now have Wheatnet software in them that integrates into our Wheatnet AoIP network we decided to go in that direction.

In our TOC we are using a Tieline Gateway 4, and it was easy to integrate into the Wheatnet network and have it show up as sources and destinations for the LXE control surfaces in our control rooms.

For the in the field remote broadcasts, we purchased a Tieline Via. This is a well-designed portable unit that really packs a lot into a small package. Once I had figured out how to register both the Gateway and the Via on the Tielink Server, Tieline's version of the transversal server that will connect the two codecs through the firewalls and routers to get their two-way audio through the internet, I was able to immediately connect them and my test was great.

We didn't have a very heavy schedule of remotes during the following month and we were so busy with engineering projects that we didn't have time to train remote techs on the new system. So, we didn't really touch the Tieline Via for at least another month after the initial testing.

With a busy schedule of remote broadcasts in December, we wanted to get moved over to the new system. Our chief engineer, Brian Bonds, wanted to test it by himself before training the remote techs. When he did, it would only connect for about a minute and then disconnect. It kept cycling like this.

I got involved again and figured it must be something with our new firewall software that was installed on our main fiber internet. It turned out it wasn't even using that internet at all as it was connecting through the Linksys router on our secondary fixed wireless internet connection. We are using both LAN connections on the Gateway 4 unit in the TOC so we can take advantage of the Tieline's Smart Stream redundant streaming.

The Tielink server was not breaking through the new firewall software, and it was having issues

with staying connected on the secondary ISP.

In looking at the firewall logs, I figured out the port range that the Tielink server was trying to use and added them as rules to both the firewall and the secondary Internet router. This seemed to make things worse.

I finally had to punt and use external static IP addresses from both providers and dial directly. I found that Tielink connection was still not working even with the external IP addresses not being behind a firewall.

However, just having the Tieline Via dialing the external IP addresses directly worked beautifully. We were connected through both internet providers, and with some redundancy on the local/receive end it was a solid connection. The nice thing about the Via is that it has multiple Ethernet connections: WiFi and two USB connections that will allow us to connect our MiFi units directly or through wireless.

With all those ways to get to the internet, we can connect one MiFi to one of the USB connectors and a second MiFi with to the other USB connector or use the WiFi of the Via to connect to the other MiFi. So, if we are in a really tough environment for internet connection, we can use two different internet providers at remote site coming back to two different providers at the studio, and Tieline's Smart Stream feature will take advantage of this redundancy.

The other game changer for us is the built-in processing on the Via. We have had lots of issues with our jocks getting very distorted at remote broadcasts, especially when they are in a noisy environment. We set the processing up primarily as a limiter to keep those moments when the jocks get excited and hit the mics hard.

I was also able to use this in reverse. We send raw unprocessed audio to remote site from the control surface at the studio and this often leads to the up and down audio feeds with sometimes very abrupt listening experiences for those attending the remote. Again, I used the built-in processing in the Tieline Gateway 4 in the TOC to keep the levels more consistent.

While it took some time to get the connections work consistently, the overall improvement to our remote broadcasts has been dramatic. I believe this will probably lead to us selling more of these remote broadcasts down the road. Hopefully, this will unit will be able to pay for itself in time.

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

As another year draws to a close, it's time to reflect on the various infrastructure improvements and maintenance projects accomplished at the station. While these behind-the-scenes efforts rarely make headlines, they're crucial to maintaining reliable broadcast operations.

One of our major projects this year was replacing the office HVAC system. The timing proved fortunate, as we secured one of the last units compatible with traditional refrigerant before the industry-wide transition to newer, more expensive systems. The old unit had developed a significant refrigerant leak that was going to be very expensive to repair, making replacement the more cost-effective long-term solution.

Maintaining our antenna tuning buildings – affectionately known as "dog houses" – was another significant undertaking. These structures require regular attention to combat the relentless effects of sun, wind, and rain. This year, we tackled some challenging dry rot issues using an innovative repair technique. The process involved removing deteriorated material, treating the affected areas with a 50/50 mixture of polyester resin and acetone, and reinforcing the cavities with resin-soaked cotton. After curing and sanding, the repairs restored structural integrity while preventing further deterioration.

Mother Nature didn't make the timing easy this year. October's unusually high temperatures in the 90s delayed my typical maintenance schedule,

and when temperatures finally dropped to the 60s, I found myself racing against approaching rain. While I completed most of the planned work, some painting tasks will need to wait until spring.

A routine inspection revealed deterioration in the covering of our Austin ring transformer primary coils – components that typically operate so reliably they're easy to take for granted. Thanks to materials supplied by Cris, including cotton gauze and red Glyptal varnish, we were able to complete initial repairs before the weather turned. The gray epoxy topcoats will be applied when conditions improve.

This year also brought some unexpected equipment updates. A failed power strip prompted a facility-wide evaluation of our power distribution infrastructure. We discovered numerous strips dating back to 1987 that needed replacement. The upgrade to rack-mounted units has significantly improved our power distribution and cable management.

On the technical side, we enhanced our monitoring capabilities with a new Inovonics modulation monitor, which has proven to be a substantial improvement over the previous system.

Looking back, 2024 was a year marked by proactive maintenance and strategic upgrades. While not every project went according to schedule, our facility enters 2025 more robust and better equipped than ever. These improvements, though sometimes invisible to the casual observer, form the foundation of reliable broadcasting operations for years to come.

Here's to another year of proclaiming the Gospel and keeping the signals flowing!

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

2024 Recap

I hope everyone had a wonderful Christmas and a happy New Year! Can you believe 2025 is already here? To say 2024 flew by would be an understatement. I stayed busy and that helped. In some ways I'm sad to see 2024 go. But in other ways I'm happy to welcome 2025. Before I get into what's coming up for us in Denver maybe a bit of a recap.

2024 saw plenty of its own issues. The DRR computer in our NexGen system continues to give us grief here and there. With the upcoming move to Zetta, I have quit trying to figure it out. There are times still, I'm sure, when the timing of the recordings isn't correct. I'm sure everyone has grown weary of it and has quit informing me of the trouble.

2024 at the KLZ transmitter site was filled with lots of detours and never knowing how we were going to get to the site due to the road construction along our frontage. While there is still plenty of roadwork left to be done, the majority of the work in front of our site is done and we have not had issues with access in a couple of months. I hope 2025 brings this project to a close.

April brought me my first trip to NAB, and I had an absolute blast. While it was busy and tiring, the experience was amazing. I'm sad I won't get to go again this year.

We also got some new Nautel FM transmitters for 95.3 FM and 94.3 FM and I love them! We still have some AC issues at KLTT, where the main unit will fail for some reason and switch over to the backup. Cris has been working with Stephen and getting a Raspberry Pi set up to be our new switch control. We will finalize that project in early 2025 I hope.

One major thing that happened was we moved 94.3 FM from the tower base at the KLVZ tower site to inside the transmitter building. This was a fun project, and having the FM equipment inside the building has made things so much easier.

We got our studio/office space recarpeted and painted. The year was filled with all sorts of projects and problems big and small.

Cambium Link

December was a good month, but we did have some issues. Some of you may remember me mentioning the link for KLDC randomly going down

and wanting to try dielectric grease on the RJ45 connector at the bottom of the CAT6 isocoil on the tower. We did that and it did not seem to work all that well. Within 24 hours I got an alarm.

The link itself didn't go down like it did before. This time, looking at the status page of the unit, it showed a good RF link, and I could even get to the GUI of the remote radio, but it showed no link on the main Ethernet interface.

I remember seeing this issue not long after we installed the unit. Sometimes I reboot would bring it back, sometimes it would take several reboots. This isn't a huge deal unless the backup internet goes down, and apparently they were having issues, too, because two mornings in a row, the station went down and there was no audio. That would take a reboot of our Barix units on both ends just to get that internet link back up.

The day after Christmas, I dragged my dad out to the site with me. I had some other things to do as well and figured we could divide and conquer. And we did.

I read online that sometimes the issue could be the RJ45 connector, so while he replaced the connector at the bottom of the CAT6 isocoil at the tower base, I hooked our new smart power strip up. I wanted to do that a week prior but forgot that when we did the rack, we bought power cables that were just long enough to go to the closest outlet. Since the power strip can't really be mounted, nor is there room even if we could, I needed to get cables that would reach the bottom of the rack where it would sit. I had all that with me and hooked it all up.

Now, we will see how things go in the long run. It's my prayer that I won't have to babysit the link for the rest of my time off. Oh, did I mention that the day after Christmas, which is when I'm writing this, is a vacation day for me (and Cris too). The life of an engineer though…

KLTT Repair Work

My dad and I did take a day to go to KLTT and do the last of the repairs we had. One of which was to tack weld that union we had to replace at tower 2 a couple months ago. I was there for moral support and to take pictures. My dad did a great job with it too. Hopefully that closes the chapter on that Austin ring coming loose.

My dad welding the union used to mount the Austin transformer at KLTT tower 2. If we don't weld it, the vibration from the tower will make it loosen over time. Don't ask me how I know.

The other repair work was the copper strap across the canal from tower 3. Over the years, the horses have dug it up in the sandy soil. Not intentionally, of course, just dirt moving and when a little piece gets exposed it eventually comes all the way out of the ground. The reason for that is horses have a habit of following the same paths over and over and over and over again. Unfortunately, we could not get these repairs done. We waited too long, and the ground was a wee bit frozen. That repair will have to wait until late spring 2025 when it is warm and dry, but not too dry.

We ended up having time this day to install these smart power strips at KLZ and at KLVZ. This will really help if/when I need to reboot equipment.

New Computers

As part of our move over to Zetta next year, we needed to get our Nexgen computers all running on Windows 11. I believe next summer is when Microsoft will quit supporting Windows 10, and rather than wait until after we have moved to a new automation software, we figured do it now so it's ready to go.

Three of the computers, all control room machines, could not be upgraded for one reason or another. Because of this, we purchased three Dell Micro 7040s. I spent the week before Christmas getting these set up.

One thing that didn't dawn on me was I needed two NICs. I would rather not use a USB NIC but wasn't sure if we could get something internal. Todd Dixon to the rescue. He informed me I could look up M.2-to-Ethernet and find all sorts of

Above, the vinyl logo on the wall of the KLVZ studio. The logo above and to the right is on the wall in the KLZ studio, and below right is in reception.

adapters. I could only find them on Amazon, but I did find them. I ordered three. Two of the three worked. I ended up having to return one and the new one I ordered is waiting for me for when I get back to the office the first week in January. I will need to install it and then schedule time to take the control room down to install the computer. I don't think this will be difficult in two of the rooms. The third one is KLZ, and it is the busiest of them all. Once these are installed that will bring all our NexGen machines to Windows 11.

Wall Vinyl

When the office got painted, they had to take down the big Crawford and KLZ vinyl decals we had on the walls in those rooms. TJ Pander, who is the director of digital media for us, worked hard to redo the logos for us. No one could find good, high-quality images saved anywhere. He also is the one who spearheaded the whole thing. I figured he'd know what to do and what to get, and rather than give myself more work, why not give it to someone else? He knocked it out of the park.

We chose to get all four station logos in their prospective talk studios as well as the Crawford Media Group logo in our reception area. They came and finally got them installed and they look amazing. I am so grateful to Travis, TJ, for finding the company and getting the designs done.

Coming Up

The first big item on the list in 2025 is RCS Zetta! We are scheduled to begin January 13. That week, RCS will do some of the work remotely, and the following two weeks they will have staff on site. I am hoping they send Jen Thompson over. Many of you have dealt with her. She is one of the most knowledgeable support people they have in my opinion. Plus, she is semi-local, living only about an hour away from the office.

I am incredibly nervous about this transition. Not everyone can learn new things, or maybe it's just more difficult. I pray that the transition doesn't scare any of our people away. I am also very excited to learn something new. It'll be great to have our facility completely up to date with everything and feel like it's from this decade.

It is my hope that when I write my next column, I can tell you everything went smoothly, and we have been on Zetta for several days with no issues.

That about covers it for this edition. I pray you all stay safe and well and have a wonderful 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

Crawford

Corporate Engineering

2821 S. Parker Road • Suite 1205

Aurora, CO 80014