The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

JANUARY 2024 • VOLUME 34 • ISSUE 1 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR

Streams!

As we begin a new year, we have lots of things happening in the technical operations around the company. New streams and a new CDN top the list.

We're pleased to now be distributing our streaming content through Soundstack. While the streams have been up for more than a month now, they have not been public. When the ball dropped, that changed and we're now on Soundstack with all our Triton streams shut down.

As always, changing CDNs includes a good bit of pain, and the change has to be worth it. Soundstack definitely made all the pain worthwhile, and their customer support has been great. We're still working our way through a few issues with metadata in the Intertech players, but everything on our end is working. And while we haven't monitored all the Soundstack streams continuously through the overlap period, I did listen quite a bit and did not hear any outages.

My thanks to all our engineers and webmasters for making this change happen. I know it wasn't easy.

Also on the list and somewhat related is the change in streaming encoders in our four largest clusters. Birmingham, Chicago, Detroit and Denver are in the process of installing Wheatstone Stream Blades.

We got a demo unit in Denver in early December and I was able to get it up and running in fairly short order, but the metadata… that was a different story. Working with Soundstack, we eventually concluded that a different version of Icecast server was needed to properly ingest the metadata export. They spun up not one but two Icecast servers for us and we got things working.

Wheatstone Stream Blade control and monitoring GUI screen.

The Stream Blade has a lot of really good features, and right at the top of the list is that metadata processing is handled by a programmable scripting language called Lua (Portugese for moon). It's a fairly easy language to learn, and rather than having to select from a list of predefined filters, none of which probably work with your playout system export or CDN ingest, you can write your own! That's what I did for the Nexgen export and Icecast ingest, and it worked like a hose.

Other features include a powerful multichannel multiband audio processor that is tailor made for low bit rate streams. Lots of presets are included, and they provide a great starting point that users can modify to suit their particular needs. If you want to hear what one of these sounds like, listen to KLVZ at https://www.legends953.com/player/. You

may want to wait for a 70s cut to really hear the processing work.

A scheduler is also included in the Stream Blade, which means that you can handle blackouts and the like locally. You can even change processing presets with the scheduler, a handy feature if your format includes both talk and music segments. It also has alerts and status monitoring that can email you or provide an SNMP trigger that you can use with your remote control or SNMP monitor. And of course the Stream Blade includes a silence sense feature that monitors input levels on a per-ingest-stream basis.

We're excited to get these Stream Blades installed and running. Very likely we will equip our other markets with Stream Blades in the future.

Generators

The generator saga continues in two of our markets – Chicago and Buffalo – but it has pretty much come to a conclusion in Detroit. I'm thrilled to share that we got at least one of these long-running generator projects across the finish line in 2023… well, almost. Mike Kernen will share more about this in these pages.

Both the WDCX-FM transmitter site in Buffalo and the WPWX site in Chicago are operational with their new generators, but the projects aren't yet done. We're still waiting on the new transfer switch in Buffalo – the new gen is connected to the old, lower capacity transfer switch for the moment, and we have to load shed a bit when running on the generator. This shouldn't be a problem in the winter when we're not running a heavy cooling load. And in Chicago, we're still dealing with a fuel pressure issue, essentially the same problem we had in Detroit but with a local propane supply. We think we have a solution in hand and are awaiting availability of a generator tech to come out with a load bank so we can test it.

The good news is that all these critical sites are covered, and we're not paying for a rental generator anymore anywhere.

On the west coast, we are still awaiting delivery of our backup generator to the KBRT Oak Flat transmitter site. It developed a fuel leak of sorts – air was getting into the fuel line somewhere – and our longtime generator tech couldn't find it in the field, so he pulled the generator down the hill to his shop where it's been for a couple of months now. He says he found and fixed the leak, so we hope to have that generator back at the site soon. We get regular public safety power blackouts at that site, so we consider generator power as primary rather than secondary, and that's why we have two generators.

Ever since the 2018 Camp Fire (named for the road near where the fire started, presumably by arcing PG&E electric lines), utilities have implemented public safety shutdowns during "fire weather" events that include high winds, and for good reason. Southern California Edison does regular visual inspections of their fire country grids by helicopter and drone, but anything can happen – a spreader, yard arm or insulator can break under strain of wind, allowing conductors to get together and make sparks. That bankrupted the big Northern California utility, something Edison wants to avoid at the other end of the state.

Transmitters

It's early in the year, but because of lead times on everything these days, we're preparing to order a Nautel GV40D 40 kW transmitter for WMUZ-FM. There are a lot of moving parts to that project, including cutting a big hole in the wall of the transmitter room and installing an oversized door so we can get the old Continental aux out and the new Nautel main in. That building is tight.

We also have plans to replace and/or upgrade some of our full-market translator transmitters. We're currently using BW Broadcast transmitters in these applications, and they have been great, mostly trouble free, but we'll be moving into Nautel VX transmitters in these applications later this year, and in one case, we plan to move the transmitter from a weatherproof cabinet at the tower base to inside the transmitter building. That will mean shoving a couple of hundred feet of 7/8" coaxial transmission line through a 1-1/2" conduit or digging a new trench… it could go either way, and I suspect we'll know in the first ten feet!

Those are just the highlights of what is shaping up to be a very busy year in our technical operation. But that's what it takes to be the best, and that's what we aspire to, providing the very best signals, the very best sound and providing the very best listener experience on all our stations. So buckle in and hang on! It's going to be a ride!

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

Hello to all from Western New York! I can hardly believe how fast 2023 steamrolled through! Looking back, 2023 was a milestone year with the move of the WDCX studios from downtown Buffalo to the northern suburbs of Amherst in March.

Along with this move came the upgrade of our facilities to full digital, an upgrade we had been eagerly anticipating for years. Now that it has been completed, I wish that we had been able to accomplish this years ago!

Not only do we operate more smoothly, our air sound has improved greatly, and making changes on the fly is much easier than operating in the analog world.

I still have some things to get used to, but all in all, the changes that were made have made my life much easier. During the winter months, when maintenance items are much slower, I will be completing some documentation that was not done during the facility build, items such as identifying port wiring to and from the numerous network switches in the Tech Center and control/production rooms. Identifying where each wire runs from the switches will greatly reduce troubleshooting time if and when a problem arises.

One big issue we resolved last year was the replacement of the damaged base insulator on tower #5 at the WDCZ transmitter site. At some point late in the winter of 2022/early 2023, the insulator cracked, and it appears moisture got inside the insulator, froze, and broke the porcelain.

As these towers were erected in 1941 on site, there were no off-the-shelf parts to replace the damaged insulator. Austin Insulator in Mississauga, Ontario took the measurements I provided of the old insulator and built a new one. Farley Riggers came in and did a superior job in removing the old insulator and installing the new one. This was the first time I have witnessed this type of tower repair, and it was interesting and definitely a learning experience, however, I don't want to do it again!

Normally at this time of year, we have all of our cap-ex projects completed for the year. However, in post-covid times, there is no such thing as normalcy.

At the WDCX-FM transmitter site, we have a brand-new 100 kW generator set in place, but no place to go. We are still waiting for the delivery of the transfer switch from the manufacturer. The projected delivery date has come and gone several times in December, and now it has become a hurry-up-and-wait situation. Winter is here, and as history tells us, there will be power outages at the WDCX-FM transmitter site, you can bet on that! We are praying that the snow and winter winds hold off until we can get this project completed.

In Rochester, our AM station WDCX(AM) is rolling along with no major issues to report on. Since we moved the operations to Buffalo last January, that dramatically cut down on the maintenance time I spent in Rochester.

In reality, the only monthly maintenance for the AM and translator is checking all operating parameters and logging such, and performing janitorial duties on the equipment. The six-tower array is extremely stable and the transmitting equipment has been virtually trouble-free this year. We did not experience any major downtime at all this past year, with the exception of a couple of power outages from utility provider National Grid

Legends 102.7 in Rochester also had a good year last year with very little in the way of equipment failures. We changed the audio delivery from the studio to the transmitter this year from fiber-optic using the Harris Interplex to AOIP utilizing a pair of Tieline Bridge-IT XTRA codecs. This greatly

reduced the cost of the STL, as we no longer had to pay a monthly charge for the fiber-optic lines, as monthly rates were scheduled to greatly increase in 2024.

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

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

Our new generator project has finally turtled across the finish line!

For those catching *The Local Oscillator* for the first time, let me recap for you the events of the past year.

About 14 months ago, several power outages forced our studio site to run on our generator: some for an extended time. I think one failure had us on generator power for five days. After that run, I noticed that the generator now had a dead miss. A mechanic's inspection confirmed it, and the problem was found – zero compression on cylinder 1 (of 6) due to a torched exhaust valve.

Our generator is natural gas, so fuel is never a concern, except when it is – let me explain.

Natural gas is a great utility because it's economical and incredibly reliable. It burns clean and provides a fuel supply that's effectively infinite. No watching tank level gauges, ordering diesel, or worries about above ground tank's interstitial monitoring, overfill alert systems, painting, marking, leaks, EPA, etc. Just hook it to the pipe and let 'er rip!

While diesel engines are well suited to standby service, their big torque and fuel efficiency don't always make up for their initial higher cost. Given the advantages of natural gas, and that natural gas was already available on the property, staying with this fuel source is appropriate. The decision was made, a Generac 150 kW natural gas generator was ordered, and after a prolonged production delay, was delivered and installed.

As happens with some big projects, things begin to come into focus as you move through them. In this case we began to understand why our previous generator failed and why we coincidently had problems with rooftop HVAC units and even our hot water tank over the years. What we learned was that our natural gas supply was impeded. Once the new generator was placed and initial testing began, we found that the natural gas pressure quickly and dramatically dropped. It dropped well below the generator's minimum required inlet pressure when only 60% loaded with the test load bank resistors. For obvious reasons, the installation technicians couldn't sign off on the installation –we'd have to correct the pressure issue.

Our natural gas supplier is the same utility company as our electric, DTE (formerly Detroit Edison), which logically means we're using one of their services to back up the other. After they did some rudimentary engineering and research, they determined that our main gas line from the street would need replacement. They never diagnosed the precise reason, but our existing line must have been kinked, crushed, or otherwise encumbered, and something along its length was restricting it, causing gas flow to be limited.

The net result of this was that our generator had been running with a lean combustion burn, which caused the valve's failure.

Once our new service was delivered from the street to our building, we had a reliable, steady source of natural gas for our building and generator. Or not. In fact, the problem still existed, albeit in a marginally different form. What was happening now was that the utility delivers gas at a standard pressure of ¼ PSIG or 7" water column. Our generator's minimum requirement as specified by Generac is 7" WC, so when under load, the pressure dropped below that minimum spec and we were stuck once again.

I arranged an on-site meeting with our DTE rep and discussed our options. I needed them to boost the pressure at our manifold, and we would knock it back down for every natural gas appliance we have apart from the generator by adding our own regulator. They agreed, but could only go in steps of ¼ PSIG, so up to ½ PSIG, which was more than the

generator's stated maximum of 11" WC (½ PSIG is 14" WC). Was this going to be a problem for the generator? I was worried that another $6,000 regulator would be required at the generator itself. This was running into money and fast!

Adding one regulator for our domestic heat and hot water and boosting the pressure at the manifold was the action we decided upon, and once that was done, I called the Generac vendor for the third initial startup attempt.

Gas pressure at the generator input at full load. SCORE!!!

Immediately after checking the gas pressure, the technician started making noises about it being too much, to which I stated that it would have to be acceptable and that I was in no mood to entertain the cost to add yet another regulator. He then spoke to his "senior tech" who agreed with me. Finally, a win!

The generator was run for four hours at its maximum capacity using test load banks. The technicians gave us a brief tutorial and I signed off – installation complete.

About an hour later, the annunciator alarm started beeping. I went outside to find a tech still on site. The alarm? Low fuel pressure! What in the revered name of George Westinghouse could be wrong now!? Fortunately, it was just a faulty sensor, which will be covered under warranty.

New FM Control Studio

Nearly as I can tell, the last time the WMUZ-FM Control studio was remodeled was in the early 1990s. The carpet had been replaced, but little else had been done, and it was looking rough! For one thing, the carpeted walls were perforated by myriad anchor holes left from the times when cart and CD racks were hung there. The cabinets were set up in a way that forced our producers' backs against the door so that they'd be bumped every time someone entered or exited the room. That same furniture was also home to lots of abandoned wiring, improvised revisions, and years' worth of dust and deterioration.

The new studio is coming along nicely. Walls wear a new layer of drywall, and paint, new lighting is installed, and our new custom-made furniture is delivered and set up. The layout rearranges the room so that not only the producer and the engineer can see the talent in the FM Talk studio, but the producer no longer gets hit by the door. Also gone are the gigantic JBL 4312 monitor speakers which for some reason hung facing each other like a massive pair of suspended headphones.

Redoing a studio of this vintage is not without a variety of challenges. For one, the JBL supersize speakers had been hanging from the ceiling for 30+ years, and while removing them wasn't terribly difficult, I had to make sure anything new would stay put just as well as they had. Also, today's studio monitors have their own amplifiers, so they need power and balanced audio, not just a 14-gauge speaker wire.

To ensure the new Yamaha HS8i speakers would perpetually defy gravity and had a place to plug in, I removed one of the room's four 2' x 2' fluorescent fixtures (we converted to LED), which opened a hatch of sorts into the ceiling. The speakers' brackets were secured using lag bolts that go through the drywall and into 2x6 wood studs that I secured to the metal studs above. Beside them, I installed electrical outlets wired with armored cable back to the cabinets where they will be connected to the room's UPS system so audio monitoring won't be susceptible to power interruptions. We also ran audio to them using Studio Hub devices.

Since the cabinets now hug the left wall of the studio rather than the right, all the wiring to and from the studio's existing inwall interconnection box had to be re-routed up and over the ceiling. To do this, I had the cabinet company make wire chases which mount to the walls and have hinged front panels. They do a stylish job hiding the wires as they make their way up and down from the ceiling on both sides of the room and easily allow for future changes.

Wheatnet Not

One obvious need for the new studio is a solid Wheatnet connection and distribution. The former FM studio and talk studio shared a common

satellite network switch for Wheatnet. A home run went to TOC, and a common switch provided Wheatnet to gear in each studio. This worked fine, but there's no time like a remodel to do things right. We ran one more home run to TOC with the intention of connecting the two Wheatnet devices in the talk studio directly to the TOC core switches – there was no reason to provide an expensive Wheatnet-capable Cisco 2960 switch in FM Talk for its nominal two devices.

Unfortunately, this approach hasn't worked. For whatever reason, having verified with the folks at Wheatstone that my port settings were correct for the connected devices, I could not get the TS-22 Talent Station and the M4 working. Late on the Friday before New Years, we discovered that the Talent Station was no longer being hosted by the M4 as it should, so we corrected that and will give it another shot once we're back from New Years break. For now, they're working fine while connected again to the FM Control room switch.

Irritating Oddity

For some three years I've run a macro on our WRDT nighttime transmitter site to make double dog certain that the site was on when it should be on, and off when it should be off. When I started at Crawford, there were a number of times when both sites were on-air at the same time. Not good!

To block this from happening again, I created a simple macro that checked for invalid operation every fifteen minutes, took corrective action and alerted me if any was necessary. As the site switching routine uses the remote-control systems' knowledge of FCC-provided sunrise and sunset times of day, I used that database to determine if the site should be on or off. This worked like a hose for at least three years before suddenly deciding to turn the nighttime site off just after midnight.

I'm told by the manufacturer that the registers that are used for sunrise and sunset are cleared at midnight, whereas one might conclude that they should be cleared whenever their opposite is true. In other words, if it's past sunrise, it's now no longer post sunset but pre-sunset, etc. I have no idea how this changed, but it did. I rewrote the mechanics of these macros to ensure that this anomaly is now impossible.

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

EF-1

The Enhanced Fujita scale classifies an EF-1 rating as a weak tornado with winds ranging between 86-110 miles per hour. It's a good fact to know, since that was the rating of the tornado that came through Homewood, Alabama bright and early on December 10th. Things like this always tend to test and teach your experience as a radio engineer, and this was no exception.

These experiences test your preparedness. What thing didn't you anticipate? Are you testing your preparations enough? Are you really prepared *enough*? In this case, I actually watched the generator do its exercise sequence two weeks earlier, and it didn't matter – when the power went out with the tornado, the battery failed to start our generator and keep us on the air.

When I got on the scene at about 1:15 a.m., my northbound interstate drive at the Homewood exit revealed that all the city to the east looked to still have utility power. To the west, well, it was as pitch black as my heart is (on occasion), and the studio is a short hop to the west.

When I got there, I determined immediately that the generator wasn't running, so I pulled the Jeep up to the generator at the back of the building, placed jumper cables on the battery and forced the generator to "on." With our backup power running, I buttoned up the generator and hustled inside to make sure everything came back on in a proper way.

One of the things I do here in Birmingham on any broadcast related computers when they initially get setup is to go into the BIOS of the machines and set their power management setting

to: “In the event of power failure/restoration” to “On.” By the time I had gotten in the building, most of the machines had booted up, but due to the harsh shutdown they had experienced, Nexgen was acting a little odd on almost all the workstations, so a reboot of the databases and the audio servers was required. That got us back on the air at about 1:50 a.m.

After a few hours of running around and checking each of our workstations, I left our studios to head home, confident that everything was in order until utility power was restored.

Listening to our signals on the way home, about 20 miles south of Birmingham, WDJC went off the air while the other stations all stayed on. I rerouted my southbound interstate drive and headed back north to the studio.

It turns out that somehow, in the midst of all of the madness, Nexgen decided to eat the 4 a.m. hour of programming out of the logs for the station as a delightful addition to my overnight work! So I added some audio to the hour to get to the 5 o’clock hour, where it looked like the logs got back normal.

We’ve all had these times, but it’s always important to learn something from them as well. So the immediately obvious first thing for me was to check the logs before I leave to make sure everything after an event like this doesn’t call me back to the station.

The other experience point came on the following Monday when I was reporting to Cris about the failure of the 24-month Interstate battery and its replacement with a new 30-month Interstate battery. It may seem rudimentary to most of you who have been chief engineers for a long time, but Cris’ suggestion to put a reminder in my calendar on my phone for 30 months out to replace the battery in the generator seemed revolutionary to me.

In my life, I’ve always had jobs where I was more of an assistant and not the boss, so it was a real growth moment for me to begin thinking about other maintenance items that can be put on a calendar. In the new year, a lot more calendaring is going to happen in the engineering realm here so that we can be more prepared for events like the one from last month.

NX50 Logs

I’ve written about this before, but it happened again to me here in Birmingham and I have determined on the second round a quicker fix to the problem. Our NX50 (along with other Nautel transmitters) has an 8 GB SSD hard drive in it to power the AUI among other things. It has a boot partition and another 2.6 GB partition that houses the Linux based OS. This is the second time that the OS partition has become full and not allowed the AUI to function. Effectively, once the drive partition is full and there is nowhere else to put log data, the motherboard basically goes into a boot loop.

Fortunately, it doesn’t affect the transmitter’s ability to make power, continue to deliver audio, or respond to external remote control commands to raise or lower power. It only affects your ability to actually get into the AUI functionality.

It was a two-day process the previous time this happened, and it involved support calls with Nautel, re-imaging the drive with a fresh ISO and then having to reenter every single setting for the transmitter. Could I do a little better the second time around?

I brought the drive back to the studio and got out our external SATA drive caddy and hooked it up via USB to my computer. I was able to see the 2.6 GB partition and immediately began to look at the /var/log folder. In particular, the daemon.log file had ballooned to an over 700 MB text tile (over a quarter of the partition size).

Regarding log files, Linux will archive/zip log files after they get a certain size or over a certain time period, and it looked like this had happened since several zipped daemon log files were present that were actually normal sized log files.

It looked like something in the SMTP daemon had gone berserk in this particular log file and simply filled the partition to overflow within the time period before it would have been archived. I deleted the file, which freed up 700 MB on the partition and recreated a file with the same user and permissions it had previously, and took the drive back out to our Tarrant tower site. Once I got the drive back in and powered on the motherboard, it immediately fired up and loaded the AUI with all of the settings intact. Hoo-ah!

This is the only transmitter we have in Birmingham that has done this, but it has done it twice now. It may be worthwhile knowing that if you run into this situation on your Nautel transmitter, it may likely be the same kind of issue, and I’m willing to help if you need it.

We’ll visit again next month. Until then, I pray the new year provides you with renewed vision and purpose.

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

Welcome to 2024! Over Christmas, I had been working a lot of weekends, so I left early one Friday to visit family in the Carolinas. I flew this time on American directly from Birmingham to Charlotte, NC, roughly centered between my sisters in Columbia, SC, my brother (who was visiting Winston-Salem, NC) and my late wife Sandy's family in the Fayetteville area. I didn't get a chance to see Sandy's mother, Ellie; she was in the hospital in Clinton, NC. I did see Sandy's sister Robyn and her husband and daughter.

Driving all over the place, as always, I listened to a lot of radio. The rental car, a Nissan Altima, didn't have HD, and had been adjusted to a "foghorn and hiss" setting on the equalizer (i.e., absolutely no midrange), but I quickly straightened that out. The AM was disappointing; it wasn't very sensitive. The FM, on the other hand, dragged in stations from Charlotte pretty much everywhere I drove. It's always interesting to see what radio is up to in my home stomping grounds.

There was a bit of excitement when I drove from Charlotte to Fayetteville. When I lived in NC, there were virtually no toll roads. In fact, our tourism folks used to brag that we were the "Good Roads State" and emphasized that you could drive pretty much everywhere without paying a dime. That has changed. Highway 74 out of Charlotte now bypasses several cities headed toward Lumberton, NC, and it is a toll road. Worse, it is a High Tech Toll Road™. There were no toll booths, no alerts, no nothing. I found myself on that stretch of pavement and when I exited, there were still no toll booths. It was all automated.

I'm sure many of you are familiar with that sort of thing; feel free to laugh at me. I wasn't. I guessed that it was all electronic, and wondered if I might be harassed by a cop somewhere in a traffic stop for "running" a non-existent booth. A quick call to Enterprise confirmed that they took care of it; it would simply be added to my bill. (The operative term is, "added." The displayed cost on the toll road was less than $3.00; Enterprise billed me for almost $9.00. Heh. But then, rental car companies have been living on nickels and dimes for decades.)

I took my company laptop with me and worked on some programming in the evenings. As I've gotten older, I've learned that I just can't go for 24 hours straight anymore. I have to take breaks (read: naps). Therefore, I only planned one big visit for each day, then back to the hotel. When I was younger and dumber, I would have tried to do all of this in a day or two. Not anymore!

The Data Relay

This is up and running for three stations in Denver; it's about ready to be shared with anyone else who needs it. This is an interim solution for those still running NexGen; the next version of RCS's automation, Zetta, supposedly has unlimited data exports. NexGen has (count 'em) only four. Several years ago, that was probably a gracious plenty; nowadays, it's hopelessly inadequate. If you have main and aux transmitters, each with its own exporter, that eats two. And if you have an FM translator or two, each of those needs an export. And then there are the streams.

Cris Alexander asked me to throw together a Python gadget that would "split" one export and send it to two destinations. I had done this earlier with HD PSD, which is UDP and quite easy to program. With UDP, you send the data and if the other end gets it, fine; if not, that's fine, too. There's no formal connection.

This metadata was for our streams in Denver, and it was TCP. This required a solid, formal network connection. Python can certainly do this, but I learned some things along the way. First – I've mentioned this before – straight out of the box, Python is totally unforgiving of errors. Try to open a file that ain't there, or try to make a connection that fails, the program just crashes with about a half page of error gibberish. You have to put everything into "try/except" blocks, which will (hopefully) catch any errors and let you deal with them smoothly. Adding the exception handling took far more time than I thought it would, but it paid off: the system ran

smoothly for all three stations all through the Christmas weekend while I was out of town.

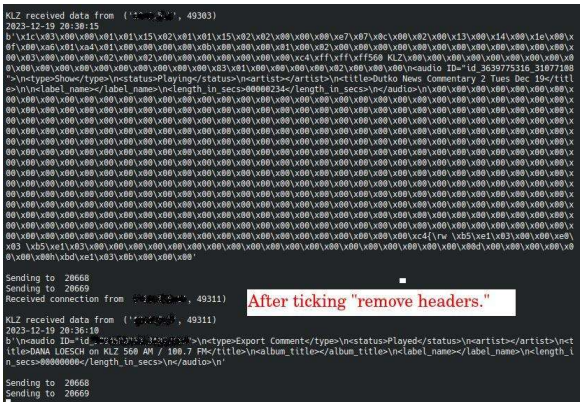

Figure 2 - Gibberish! Lotsa Gibberish! (Until I clicked The Box™)

Figure 1 shows one amusing thing that I also discovered. In NexGen, on the Exports tab, there's a little box that you can check to "remove headers." I wondered why KLZ was sending me a boatload of gibberish on each transmit, mostly zeroes. This sometimes caused the streaming data not to be displayed properly. Ticking that little "remove headers" box cleaned things up considerably (see the bottom of Figure 1).

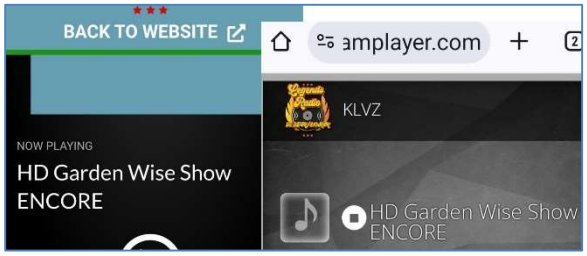

Figure 1 - The relay at work, sending to two different encoders.

Figure 2 is a brag picture, showing the meta data going to two separate streams. Works like a hose. I run three separate versions of the Python program in separate Linux screens, which allows them to keep running whether one of us is logged in or not. Using Wireguard (the only way this can be accessed – on purpose), we can log in with SSH/Putty, click "screen -r KLZ" (or whatever) and see how things are going.

We had also been working on a Web interface to allow adding and deleting packet routing (Figure 3). I did some of that while I was on the road as well. The screen shown here is the "edit an entry" page. You still see all of the other data relays, but the one being edited is automatically highlighted (but as

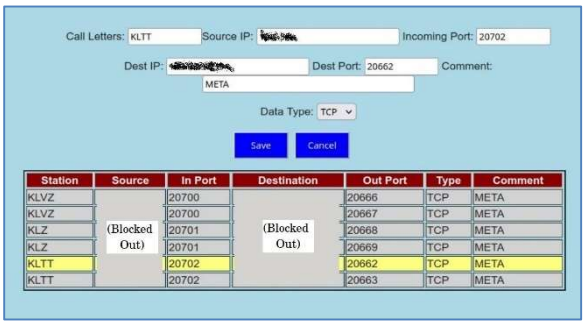

Figure 3 - A Web interface will make it easy to change things around.

with the other images, I've blocked out or obscured the IP addresses. Just because.) I found out the hard way that it's easy to forget what and who you're working on if all you see is the "enter some data, B'weet!" form at the top.

We'll get that running before long, Lord willing. Cris had suggested this when I did the first split/relay for the HD-PSD. Right now, we have other things to do, including ...

My Hope Now

This sort of got squished off to the back burner over the holidays. I've been trying to find a programmer who will simply rebuild the existing app for Google Play, but most of the ones I've encountered either (a) speeka-no-Inglish or (b) want to take over everything and, in effect, be a contract programmer for the company. But I have also been doing a lot of reading and research, and I want to do what's best and most cost-effective for this company. (Always.) I may end up doing this myself.

This biggest issue that stopped me in late December was trying to find all the "license strings" for each module that we're using for both the MHN Website and the Android/iPhone apps. Being a programmer with 30 years of experience, I have to say that some of this has been frustrating for me. I used to write system-level device drivers for pay, and I programmed in pure assembler and a bit of "C" for many years.

The available documentation is horrible. Amazon apparently wants you to go through their (paid) courses to figure out how to use all that stuff. (To be fair, Apple and Google are the same.) I downloaded a booklet that supposedly covered "AWS in a nutshell" and it's a very small, badly-done nutshell. It's basically someone's PowerPoint presentations snipped and clipped into a couple of hundred pages. Errrrf.

Coming Up

Lots of more stuff. MHN and AWS, whether we can find a contract programmer or I end up doing it myself. Cris has made it clear that he wants all of this brought in house, under our control, rather than scattered all over "The Cloud™." There are plenty of other things that need doing, too.

I hope and pray that everyone had a blessed Christmas, and I pray for a good 2024 for each and every one of you, and for our good company. Until next time, keep praying for this nation!

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

Like most of the Crawford Stations we switched streaming provider to Sound Stack at midnight, January first. This went smoothly per our plan, we had to switch the export in our automation software from TCP to UDP and restart the Nexgen software on all four of our audio servers.

One of our engineers, James Kelly, was helping out the board operations due to a shortage of personnel that night, so he took care of it on the spot. That went smoothly, and we kept our metadata flowing.

There was one thing that I didn't really give much thought to ahead of time, and that was the way we keep track of our streams locally. We use Inovonics 610 streaming monitors to do this. They are very handy devices that connect a URL. It then outputs audio in both AES and analog.

Our Inovonics 610 stream monitors are all dark.

Their front panel displays have meters and metadata displays. With those monitors, at a glance you can see your stream status. There's also a web page and email alarm module.

We use the 610 monitors to feed audio to the Nielsen MCEM Multi Encoder Monitor to make sure we are maintaining PPM confidence. I thought that we could simply change the URLs on the 610 monitors and be back in business fairly quickly. However, this was not the case. When I put in the new URL to 610, I immediately got a no connection message. It didn't take long for me to notice that unit was adding an HTTP:// to the URL which already had the HTTPS:// leading the URL. My guess that this was causing the connection issue turned out to be correct.

I pored over the Web GUI of the unit and then the manual and found nothing that addressed the problem. I figured that I would probably have to update the firmware. I went to the Inovonics website and downloaded the firmware installer and latest firmware. I also downloaded each of the 610's configurations in case we might lose all the settings.

Before actually performing the firmware update, I reached out to the Inovonics support department to seek their advice. Unfortunately, the news was not good. The Inovonics 610 Streaming Monitors do not support the HTTPS:// protocol. Thankfully, we found a solution. We removed the "s" in the URL and forced the 610s to port 80. Now they're working. But we hope that Inovonics will add HTTPS:// capability soon, since that's where everyone is headed.

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

Sometimes Slow is a Good Thing

December was a nice, slow month for me at Crawford. It gave me time to finish up some last-minute maintenance items and to do my yearly cleanup at my desk. Not that my desk gets messy, but my files sometimes do. I make sure to go through all of my EAS logs for the year to double check and make sure I got it all right. Then I gather all the packing slips I have kept and file them in a different place.

I also went through various files just to be sure they were still relevant and if they were not filed properly, to do so. Anything to help when I need to find it again. I did the same thing in my files on my computer. Making sure things are in their proper folders, deleting anything irrelevant. Then making my backups of some of the critical computers to take home with me while I was off the end of the month.

Site Trips

I did make a trip to each of my transmitter sites before the long holiday just to be sure things still looked good. I changed filters and did some very minor cleaning at the sites.

With the help of my new assistant, Dylan, things at the sites are getting better every day. I appreciate his willingness to go out on the weekends and get things cleaned up and taken care of. He's a guy who seems to know his stuff, so I don't have to worry about him as much. I was surprised when he told me he went to our 810 KLVZ AM transmitter site.

The site, although it's a prefab building, still evidently has some holes somewhere… where they are, we still don't know, but flies find a way in and come in. Each time I go out there, the floor is just covered with dead flies. He swept them up then got into the rack and found the volume control potentiometer in the Fostex rack-mount speaker we use to monitor the AM and FM was dirty. It made a lot of noise when turning the volume up or down. He took that thing out and cleaned it up really well so it isn't scratchy anymore. This is an issue we have known about for a while but just had not had the time to really deal with, and because it didn't affect the operation of the station, it was a very low priority. I had not even thought to tell him to look at it, so the fact that he just did it was great.

That's the kind of help I need. Someone who can think for themselves and take the initiative without needing a bunch of handholding, although I am here when needed for that when necessary.

I did have to make a quick trip to that same 810 site while I was off between Christmas and New Years. I knew Dylan was off and out of town. I made the mistake of checking my sites via their security cameras and noticed a fence panel had fallen down at one of the towers. Thankfully it was an easy fix, just needed to use some better screws.

Upcoming

January 1 marks us switching over to a new stream provider. In Denver, we already have a Wheatstone Stream Blade that we have been testing out and absolutely love. After we set up our new streaming service for testing, we were able to get the stream blade set up and we love the sound it produces online. I look forward to moving away from our PC-based encoder, although it is a good backup if something goes wrong with the Stream Blade (perish the thought!).

It is still crazy to think of all that is possible in this day and age with AoIP. Our racks are getting less full, and the cables are almost nonexistent. It's something I personally like because there is nothing more annoying to me than having clusters of cables that don't look neat. And let's face it, it's easy to get them all routed properly and looking good when you can do it new, but as you add months or even years down the road, it becomes increasingly difficult.

We are slowly making our way through the sites and getting the cabling cleaned up. Some sites will require more work than others. But with some

careful planning we'll get it done.

I have no doubt we will have some minor projects to start in January, but what those are I cannot even think of right now. As I write this, I am actually still on vacation, so my brain is not in work mode yet. I look forward to January though and the new year. 2024 is going to be a great year.

SBE

I figure I should remind you that if you are an engineer, retired or current, you should consider joining your local Society of Broadcast Engineers (SBE) chapter. If your chapter isn't active, then search around for one, that is. I am always willing to help someone figure this out. If I don't know the answer, I know someone who does! Here in Denver, I am the chairman of our chapter and I try to make most meetings hybrid. January won't be hybrid, but I have no doubts we will have other meetings that are. I even record the meetings and post them to YouTube. I may try to find a way to record our January meeting since Jay Tyler from Wheatstone will be here and anyone who knows Jay knows it will be a fun meeting!

The SBE is a great way to help you stay current with your knowledge. They have tons of webinars and university courses you can take. If you do your membership at the MembersPlus level, you can get all these for FREE!!! If you have an active chapter, it's also a great place to really get plugged in. Feel free to contact me directly if you do have questions.

That about covers it for this edition. I pray you all had a very blessed holiday season. 2024… here we go!!!!

KBRT • Costa Mesa - Los Angeles, CA
740 kHz/100.7 MHz, 50 kW-D/0.2 kW-N, DA-1
KNSN • San Diego, CA
1240 kHz/103.3 MHz, 550W-U
KCBC • Manteca - San Francisco, CA
770 kHz/94.7 MHz, 50 kW-D/4.3 kW-N, DA-2
KLZ • Denver, CO
560 kHz/100.3 MHz, 5 kW-U, DA-1
KLDC • Brighton - Denver, CO
1220 kHz, 660 W-D/11 W-N, ND
KLTT • Commerce City - Denver, CO
670 kHz/95.1 MHz, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Denver, CO
810 kHz/94.3 MHz/95.3 MHz, 2.2 kW-D/430 W-N, DA-2
WDCX • Rochester, NY
990 kHz/107.1 MHz, 5 kW-D/2.5 kW-N, DA-2
WDCX-FM • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDCZ • Buffalo, NY
950 kHz/94.1 MHz, 5 kW-U, DA-1
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT
WCHB • Royal Oak - Detroit, MI
1340 kHz/96.7 MHz, 1 kW-U, DA-D
WRDT • Monroe - Detroit, MI
560 kHz/107.1 MHz, 500 W-D/14 W-N, DA-D
WMUZ-FM • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WMUZ • Taylor - Detroit, MI
1200 kHz, 50 kW-D/15 kW-N, DA-2
WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT
WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT
WYRB • Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT
WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT
WYDE • Birmingham, AL
1260 kHz/95.3 MHz, 5 kW-D/41W-N, ND
WYDE-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT
WXJC • Birmingham, AL
850 kHz/96.9 MHz, 50 kW-D/1 kW-N, DA-2
WXJC-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT

Crawford

Corporate Engineering

2821 S. Parker Road • Suite 1205

Aurora, CO 80014