

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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Done!

What a month September was! As noted in these pages in past issues, we have been long anticipating completing the move of KLDC, our 1220

kHz station in Denver, from the old Ruby Hill site to the KGNU site. I looked forward to the move with both anticipation and dread... anticipation of the project and the upgrade in facilities that it represents; and dread of the time pressure, difficulties and both physical and mental challenges that I knew would come. I'm happy to report that the project is done, it went relatively well, and KLDC is now operating from its new home in Englewood, Colorado.

In a couple of months, Amanda and I plan

to do a project article in *Radio World Engineering Extra*, so we don't want to give away too much here in advance of that, but I will give you the brief lowdown.

After doing all the prep work we could in advance (as detailed in these pages in prior months), the core of the project started on Monday, September 12. Stephen Poole was on hand to assist as we shut down the station at the old Ruby Hill site and disconnected the old diplexer and prematch cabinets. We helped contract engineer and friend Eric Scace get a newly constructed ATU mounted in place of the old prematch cabinet so that the remaining station at the Ruby Hill site could get back on the air. With that done, we loaded up the diplexer and prematch cabinets in the company truck and a rental truck that Stephen had and hauled them to the KLZ site. Next came removal of all the existing

components and a thorough cleaning of the old

cabinets. 23 years of Ruby Hill grime did not let go easily, but Amanda got it done. We soon had clean, blank canvases in which to build the new filters and matching networks.

The next two days were spent physically constructing the diplex filters. This involved some modification of the existing cabinets and a lot of drilling and tapping. Then came the plumbing, with precision bends made in the silverplated tubing with a bender. The end result is not quite as good as the amazing folks at Kintronics achieve, but it's

close! After plumbing everything, we pre-tuned the filters and networks.

On Thursday, we hauled the cabinets to the new site and bolted the stands to the prefab mounting pads that we had put into place. We connected ground strap and got to work on the external RF plumbing. I got lots of practice with our oxygen/acetylene torch brazing ground strap and ³/₄inch copper tubing.

Friday was "D-Day," the day we took the other station (KGNU) down and cut in the new filters. We had to both relocate and modify the existing KGNU ATU, and we had a lot of adjusting to do, especially on the KLDC matching network. The proximity of all those cabinets resulted in a

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Left to right the KGNU ATU, the 1390-pass/1220-

reject/KLDC ATU cabinet. Behind the cabinets

reject cabinet, and the 1220-pass/1390-

but not shown is the prematch cabinet.

lower self-impedance than what we had measured, and it took some doing to get things matched. We got both stations back on the air that evening around 8:30 PM.

The following week we had to do the IM and spectrum measurements (all good), measure the base Z and file the FCC license applications. Then we had to run conduit from the building out to the ATUs and tower for remote base samples and for the CAT5 run to the isolation choke for the microwave link. We had to make permanent transmission line runs and do a lot of cleanup as well.

So, how does it sound and perform? *Great!* I am amazed at the on-air sound. It's far louder than it used to be, and its signal seems much stronger than it was on Ruby Hill. I didn't but probably should have made some before/after field intensity measurements in a few locations, but the bottom line is that the signal is loud and strong. The on-air sound is excellent, the result of an optimized diplexer design, and the digital performance is amazing – the station locks in digital quickly and holds lock like a vise.

Looking back, was the dread justified? You bet. We ran into all kinds of challenges that we had to work through, and the fact that I'm well into my 60s now was reinforced daily. As I write this a couple of weeks after the project, I'm just now starting to feel normal and walk without being bent over. My guess is that Stephen has also been slow to recover, and even Amanda was paying for all the physical contortions until a few days ago. What about the anticipation? Did we achieve the payoff that we expected? Indeed we did and more. We now have a nice, clean site with a great antenna system and the signal and sound are second to none. The results were well worth the pain and effort.

My thanks to all who were part of this project! Thanks to Amanda, who worked long hours to make it happen. Thank you, Stephen Poole. We couldn't have done the project without you (okay, maybe we could, but it would have taken a lot longer and been a lot less fun). Thanks, Eric Scace, for all your help and cooperation. We very much look forward to being site-mates with you and KGNU for many years to come. And thanks to my lovely wife Phyllis and to Amanda's husband Jordon for putting up with us during this project. You guys were our anchors and encouragers.

Keith Peterson has created a photo gallery of the project, and you can see it at

https://crawfordmediagroup.net/kldc-photo-gallery-2/.

Buffalo Progress

Our tenant finish at our new Amherst, NY studio leasehold is just about done. At present everything is done except for the glazing. Glass is scheduled to arrive on the seventh of this month and be installed shortly after, Then the studio cabinets will be installed – they are complete and ready to install, but we need to get the glass in first. That will wrap up the non-technical part of the project.

Brian Cunningham now starts work on

installing racks and cable ladders and terminating all the Ethernet wiring in the TOC. He will have plenty of time to get that done, however. because the Cisco switches that will be at the heart of the new facility won't ship until mid-January at the earliest.



One of the new WDCX/WDCZ studios ready for cabinets and equipment.

The good news is that some of the Cambium microwave equipment we will need for the new site has landed. I have the upper-6 GHz radios for the Boston-Hamburg path on the bench here in Denver, configured and almost ready to ship. We plan to get that link up and running this fall. The 23 GHz radios have shipped and I expect them to arrive at any time. Those are for the link from the new leasehold to a relay tower (SUNY) nearby. The bad news is that the remaining upper-6 GHz radios for the SUNY-Boston link likely won't arrive until next spring sometime. I suppose it matters little – I don't see how we could install that link in the dead of winter.

So, very soon we'll be all dressed up with no place to go. Still, it's a relief to have some major phases of the project either done or close to being done. There will be time pressures later on, but they won't come from the tenant finish. Stay tuned for updates on this project.

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

Hello to all from Western New York! I cannot believe how fast we transitioned into fall weather here in the Northeast! We went from

the studio cabinets to be installed. At last check, Pat Viola, our cabinetmaker, was waiting on several pieces of laminate to arrive so they could complete

sweltering heat and humidity to wet, cool weather virtually overnight.

I still have a number of outdoor maintenance jobs to buttonup before the snow begins to fly, but the never-ending rain is hindering my ability to get the summer outdoor projects completed, and soon, winterization will begin to ensure all our sites are protected from the harsh winter weather and protected

from any varmints that wish to call our equipment enclosures and buildings home for the winter.

This summer went on record in the Niagara region as one of the hottest, driest seasons we had in several decades. In a normal summer we experience less than a handful of days with temperatures 90 degrees or higher. This year, according to the National Weather Service, Buffalo reached 90+ degrees 23 days this summer, not far off of the record set in 1955 when we had 32 days of 90+ degrees.

What will the winter bring? It's too early to tell, but according to the Farmer's Almanac, we are in for lots of snow and below normal temperatures for the 2022/2023 winter season. Yay! Just what my old bones wanted to hear!

The Amherst leasehold tenant finish quietly came to a finish the last week of September. On Tuesday the 27th, the project foreman and I performed a walk-through of the new facility and we signed off on the project. Everything was done well and to our satisfaction. The only remaining item to be completed is the glass installation in the control room, talk studio, and office manager's office. The glass was ordered at the beginning of August for September 1st delivery, but manufacturer delays have pushed the delivery date to October 7th.

Hopefully, the installer will be able to get the glass installed soon thereafter so we can schedule



the laminate installation for several of the countertops.

It seems that no facet of manufacturing or sales has not been affected by the COVID-19 pandemic. Anything you order these days, it's a gamble whether the item will be in stock or even available from the manufacturer in a reasonable amount of time. We are still waiting on several microwave radios and antennas to be delivered and

other incidental items that are crucial to this project.

It is fortunate that we are not under the gun to move in short order; we have several months cushion in order to get our facility moved. Our only concern is that the weather (i.e. S.N.O.W.) holds off until we can complete the move. Patriot Tower out of Rochester is on standby to install our new microwave equipment on the WBFO, WDCX-FM and WDCZ towers. We are hoping that we can schedule our dish installations before the cold weather arrives.

In Denver, Cris has already tested and programmed the microwave radios, which will save many hours in installation time and troubleshooting. I am anxiously awaiting receiving the new equipment and thankful that we will finally be retiring the old 950 MHz Moseley STL equipment, which has become obsolete and difficult to obtain parts for servicing.

In other news, we recently lost one of the RF modules in Rochester's Broadcast Electronics FMi-201 transmitter, which operates strictly in the HD mode. As field repairs are almost impossible (aside from a fuse replacement), sending the failed module back to the mother ship is inevitable. Most choose to go for the module exchange program which will get you back up and running at full power much quickly, but that comes at a cost, about \$2500 per module exchange. I optioned to have BE make the repair to

our module and bill us for the parts and labor. This may take a little longer, but the savings is well worth it. In our case, we saved almost \$2,100 dollars, and turn-around time was just a little over a week.

In Buffalo, we recently experienced an outage of internet and phone service at the WDCZ transmitter site in Hamburg, NY. Upon arriving at the transmitter site, I found that our fiber-optic cable that provides signal to our building had been cut. Our tenant, WHLD, had recently purchased new services from Spectrum, and their installation crew inadvertently cut our buried cable while trenching to install WHLD's new cable. The next morning, Verizon arrived to run a new buried cable from the utility pole to our building, a distance of approximately 100 yards. They got the job done in short order, and we were back up with full services. However, WHLD was then off the air due to Verizon cutting Spectrum's cable while trenching our new fiber-optic cable! When will it ever end?

That about wraps up another month here in the great northeast, and until we meet again here in the pages of *The Local Oscillator*, be well, and happy engineering!

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

Greetings from the high seas!

I'm writing this while relaxing in my stateroom aboard the wonderful *Odyssey of the Seas*!

As most readers will understand, I'm using a breadth of technology neither available nor even dreamt of when we started our careers in broadcasting. The laptop computer, Wi-Fi, satellite internet, and even the very word processor I'm using were not heard of when I first started taking computer classes. In fact, the first computers I used in high school were either used by way of punch cards or teletype terminals with acoustically coupled modems that operated at a rate of just 160 baud. I

recall typing commands that were echoed on the paper (no monitors here), and the computer replied by printing on that very same paper. Remember The Oregon Trail? I must have died of dysentery every time I played that little text game!

Well, technology has advanced rapidly and wonderfully as we all know, but it's fun to remember where we came from. There are likely those of you that don't remember a time without the internet - I'm getting a bit gray around temples.

One of the most amazing things about our current suite of technologies is how it connects us, sometimes for better and for worse. I'm able to do such things as see the user interface of a transmitter, look at security cameras, set the alarm at my home, or be notified of abnormal statuses, all from the comfort of a cruise ship (sometimes to my wife's displeasure!).



Please stop ruining my cables!

Three times now we have damaged or severed a connection from our antenna monitor to its

RF sample current transformer. This first happened when a contractor cut through one while clearing out growth. The second was my fault, trying to pull out a stump with the front-end loader on the tractor. The third was another hit by a bladeequipped weed eater. These have all been repaired and everything works as it should.

The final damaged cable repair was not without considerable difficulty. The difficult piece was not the lying on my back under an ATU

(thankfully it's not winter!), but finding the connectors for this old Cablewave 3/8" sample line. It literally took me weeks.

Running new cable is out of the question since this would require trenching, the new cable, and new calibration of the antenna monitor system. I finally did locate a stock of connectors and bought some spares which were likely the last ones for sale anywhere.

Keep my perils in mind while working in and around your ATU's and tower tuning houses. My new rule? No mechanical devices are to be used in the areas where these cables are run. Spray only.

The Best Laid Plans of Mice and Men

I've quoted this line from "To a Mouse" by Robert Burns before because its meaning (for all the planning we do we cannot guarantee an outcome) has stuck with me for decades. This one and another,

"There are none so blind and those who will not see" (John Heywood circa 1546) (understanding cannot be forced upon someone who chooses to be ignorant), seem to be rigid constants amongst a world of variables.

I'm sharing these because I maintain that we must be openminded and considerate of other's input.

We've all found ourselves determined to a point where we bury ourselves despite overwhelming evidentiary proof, contrary to our prejudices and opinions. To be committed to one's efforts is admirable, to forge ahead without considering other's input is arrogance.

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

We Have Met the Enemy, and They are Us

Some of you will recognize this as a play on words from the quote by Navy Master Commandant

Oliver Perry to major General William Henry Harrison, "We have met the enemy and they are ours." On September 22nd, we went off the air at our WXJC-FM tower in Cullman, Alabama. It's a somewhat odd occurrence since we have a generator at the site and STL backups. A number of things can roll through your head as you listen to hiss during a 55-mile drive from the studio.

When I pulled up to the site, the generator wasn't running so I immediately tried to crank it manually – it turned over but no fir



manually - it turned over but no fire. I assumed



Gate hardware and combination locks will help slow down the enemy.

poorly that the battery wasn't giving it the kick it needed to crank well, so I went for some jumper cables. Of course I have some in every car I own except the one I was in. So I ran back

to the interstate to purchase some cables, and right as I paid for them, I got a notice from our SNMP monitor that the Dragonwave radio and the transmitter were coming back on line – utility power had been restored. I needed the jumper cables anyway, so thank you Jesus for that blessing.

As I got back to the site to dig a little deeper into what was going on, I found that the 12-volt fuel pump had been tampered with and thieves had once again gotten some diesel fuel for free. So I had met the enemy, and it

was us – humanity. I got it hooked up enough to fire the generator off and then called our technician. He came and checked my wiring job and declared it correct.

I went and got some hardware and combination locks to secure the doors better to at least slow down their attempts. I stopped by the county sheriff's annex near our tower to register the tampering and theft. They did tell me there is a drug rehabilitation halfway house about a mile from the site, so we may need heavier artillery before it's all over.

With those in place, I turned my thoughts to why the freshly installed POE surveillance camera didn't give me a motion alarm email. In this case, I hadn't actually set up the email capability on the system, and the other issue was that my install of that camera was faulty. I hadn't weather-proofed about an 1/8" of the connector at the end of the cable. All the rain we had in late July into August had soaked the Ethernet connection and shorted the PoE portion of the cable. Of course, that meant no video evidence

of the theft since the camera was not on to record it. So I had met the enemy, and it was me.

So often, our engineering efforts are attempts to combat the enemy – humanity – whether it's us or them. It's processing through every conceivable notion and protecting our equipment against them. We lost a couple of rounds this month, but we dusted off, got back up and moved toward fixing the error and making it better.

Tower Site Multi-WAN

We got Viasat satellite internet service set up at our Tarrant site as backup for our 11 GHz microwave link, so I was searching for a router that might meet our needs and found the TP Link TL-ER7206. It's around \$160 and can handle up to three WAN connections (one SFP-GBIC and two RJ45 types). You can set up a PC as a software controller and have cloud access to the router as well. I like it and plan on implementing the same router at a couple of our other sites so that we can manage the routers from a central location. You may want to check it out if you find yourself with a similar need at your sites.

Most of us don't need a reminder that Jesus is returning, but in case you needed encouragement, the local electric cooperative in the area where I live has been working on building our a fiber internet infrastructure for some time. Kim and I finally had opportunity to replace our low-speed DSL with the high-speed fiber service at our house on a county road in Jemison, Alabama. We went from 15 Mbps to 500 Mbps. As you might already surmise, the world's not ready for that and Jesus is coming soon!

Be praying for Florida, I've got a lot of family there and they're getting hammered with Ian's rain, wind and tidal devastation.

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

I am generally regarded as a fearless man. For example, I routinely take my blood pressure medication with strong coffee – just because I can. It

is no surprise, then, that I should overcome all fears and, trusting in the Lord, go to Denver to assist Cris and Amanda with the KLDC move.

Why should I fear, you might wonder? First, I chose a nonstop flight on United that was reasonably priced. The flight was fine, and as small jets go, the Embraers are an order of magnitude better than the CRJs that Delta and American's regional airlines tend to use. The only problem was, the plane

was ghetto. Oh, it was clean on the surface, but that's all: it was surface clean. Look down in the crevices and cracks and you could see mold, grime, and things that haven't been granted a name yet.

But I fearlessly persevered. We couldn't have asked for better weather, and Eric Scace, the engineer for the other station that we would be combining with, was a good guy. Amanda and Cris were their usual hard-working selves. Keith Peterson had intended to help but wound up ill and in the hospital. He apologized for not being able to meet me this time, but of course, no apology was necessary.



As I write this, he's out of the Health Hotel and is recovering at home.

Anyway. Fearlessness was also required

because I knew I'd have to work like a Hebrew slave, and I did. We humped old ATUs from the original site to the new; Cris had to find ways to mount a million coils and capacitors into said ATUs (which he did!), and then get everything tuned. God blessed us, and by Friday, when it was time for me to start packing for my Saturday flight, both stations were combined and on air. Some glitches and tuning remained, but it was a milestone.

Best of all, I managed to time my escape before Cris, Amanda and Eric had to haul a bunch of sandbags to weigh down the ATU pads. Tell me I can't plan ahead. Life is good. But in all seriousness, I am honored to be asked to assist and I'm glad I could help, even if Cris did most of the really hard (think: cerebral) stuff.

A Broken Fiber Link

Right after I returned to Alabama from Denver, I started getting complaints about the email server not responding. We have two ISPs in



Figure 1 - IP addresses blocked in one hour, most from Eastern Bloc countries.

Birmingham now; Spectrum takes care of routine office and studio traffic, while an older AireSpring link is used for email, our local FTP, and other critical stuff (including NexGen access). I tried to get into the email server; no joy. The FTP (which is on a different IP address) wasn't responding, either. The Nexgen stuff was missing.

A little investigation showed that ATT, the "backbone" provider (even though we contract through AireSpring) had a broken fiber line somewhere between Birmingham and Atlanta. Todd called AireSpring and established a trouble ticket. I did a few searches online and found an outage map that, sure enough, had an ugly circle that encompassed our area. The rest of the country was fine.

This stumped us at first, because the link was intermittent. It's almost as if the broken fiber was able to pass some photons here and there, but then would lose the link again. The effect for us was, we'd get some email, then it would stop. Over and over. But I'll give ATT credit (and you have no idea how difficult it is for me to do that): by 2:00 PM, they had the fiber repaired and everything was humming normally.

You know me: I have to make a point with something like that. We are all dependent on our messaging, email and phones to contact one another. I makes you wonder, shouldn't we have a backup plan in place so that everyone can be notified if there's a major outage? Those who are on a nationwide cloud/collaboration scheme like Office 365/Outlook aren't invulnerable, either; those systems can (and will continue to) fail.

For now, I'll just repeat the usual: make sure you keep local, accessible copies of all important work – contracts, emails, whatever. Don't just assume that it'll be in "The Cloud" when you need it.

... And Hacking, It Never Stops

Our web and email servers stay busy. The web server in particular will sometimes max out all but one or two cores and most of its memory to keep up with demand (and we ordered a top-flight, fullyprovisioned Dell server for this!). If you add hacking attacks to that, it doesn't help at all.

Figure 1 should be familiar to regular readers of this column. To the uninitiated it looks like a jumble of numbers, but that represents the number of IP addresses that our server blocked in just one hour. Most of these, as usual, are from "eastern bloc" countries – China, Russia, the usual. In one hour. Thank the Lord for Fail2Ban, which is just one of many tools that we use to protect our exposed servers. It allows you three (3) attempts, after which it blocks your IP address for an hour.

I'm pretty sure I've mentioned this here before, but keep that in mind, by the way. If you can't remember your password, don't just keep stabbing in different guesses. This is not only true of our systems; most nowadays will only allow a limited number of attempts before locking you out. In our case, it's only for an hour, but some (ex., Apple) can make it much longer, and/or require that you contact them, hat in hand, to have your access restored.

Mr. Don Crawford

Mr. Crawford shared the history of the company and his philosophy in a recent Zoom meeting. The history was fascinating, and I especially enjoyed his recap of how he came up with our "Tailored Plan" sales concept. He told of the early days, when he'd watch a salesman just sign a contract for a bunch of "spots" that might or might not work, paired with an advertisement that was boilerplate ("for the best prices, visit Schlomo's Sanitation Services!").

I am anything but an expert on his carefully crafted and tweaked ideas. My ministry with our company is to do my part to keep things running so that our hosts will have a platform, and so that our salespeople will have something to market. In spite of my title as "Cousin IT," I fully and emphatically agree with him that radio is our key product. Everything else may enhance or buttress that, but radio is central. And, just like him, I love radio (and always have). (Radio rules, TV drools!) (Heh.)

But I was especially struck when Mr. Crawford said that we formed a partnership with each advertiser. We don't just sell them a "box full of spots," we want them to succeed. We want a plan that works with the client to grow their business. Contrast



Figure 2 - Work in progress: the home studio monitors.

this with the usual way that most stations work – especially, and ironically enough, in the larger markets. It's all a Ratings GameTM. Make a good Arbitron "book," then watch the money flow in! (Though anyone who believes it's that easy is living in La-La, right next to Ding Dong).

I wish I could remember his exact words, so I hope he'll forgive me if I've misquoted him ... but in essence, he said that bringing the listener and advertiser together is what matters. As for ratings, even if you have only a small percentage of a huge audience, that will still represent a tremendous potential for the advertiser. But I'm explaining it badly, so I'll just stick to my Cousin IT thing.

The Home Studio

Still working on my home studio in my copious spare time. Figure 2 is a (terrible) picture of my JBL monitor system going into place. I'm using the 308 powered monitors with the LSR310 subwoofer. The sound is astonishing, given that the bass if flat down to about 30Hz. Plenty low enough for me. The reason this matters is that in the past, when I've done a mixdown, the end result can end up sounding very bassy. I was compensating for bad speakers and/or headphones.

I also have a really good microphone (for a home studio, anyway): a Sennheiser condenser and one of those fancy-dancy wrap-around acoustic foam things (Figure 3). A few years ago, I purchased a set of MXL condensers that sounded OK ... unless you overloaded them. Their definition of "overload" was at a surprisingly low threshold, too. They would splatter, break up and "splut" at the least provocation.



Figure 3 - A real microphone! A Sennheiser condenser.

Life is good, and God is great and I am blessed to work for the best company (and with the best people!) in communications. Until next time, keep praying for this nation!

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

A year ago, I was looking at the infrastructure for our HD operations. We had been gradually losing the ability to have backup

transmitters for the HD signals. Most of this was due to the aging 20-yearold exporters and importers that had bad motherboards that were no longer available for replacement, or if they were available, they were at exorbitant prices.

Out of the four transmitter sites we have in the Chicago area, only one had a backup HD importer/exporter combination that was 20 years old. That is our Lansing site, which had a new Nautel GV5 transmitter installed with the Nautel HD Multicast+ importer/exporter four years ago. That was followed by a Nautel GV20 transmitter to serve as

the backup transmitter for WSRB and an offsite aux transmitter for WPWX. That transmitter also came with its own Nautel HD Multicast+ importer/exporter.

The other sites had backup HD transmitters with relatively good exciters, but not so good importers and exporters. So, when it came to planning the 2022 budget, one of our main goals was to upgrade the HD equipment at the other three sites.

Besides purchasing three Nautel HD Multicast+ importer/exporter combos, we would also need to add some Nautel LVDS adaptors because we would be interfacing them with Broadcast Electronics FXi exciters and BE FMi transmitters.

In reality, I was not planning to directly interface the newly purchased Nautel HD Multicast+ units with the BE exciters/transmitters. Instead, I decided to pair them with the main transmitter at each location as each of these sites has a Nautel transmitter that is of relatively recent vintage. The idea is to put your best assets with your other best assets.

Once the new Nautel HD Multicast+ units were put in place with the main transmitters at each site, the "older" Nautel Importer+ and Nautel Exporter+ discrete combos would then be used to match up with the BE exciters/transmitters using the LVDS adaptors. In this way, we are improving both the main and auxiliary HD operations.

After receiving them from Nautel we got the new Nautel HD Multicast+ units licensed, and then I



configured each one for its respective site. We were ready to deploy them during the week of this writing. However, we hit a bit of a snag. Late on a Friday afternoon, I got a text from the program director of WPWX, and he was stating that the HD1 had no artist and title information on the display.

I tried using PuTTY to log into the main transmitter's exporter; I had done this without issue recently to get my settings for the new setup. I couldn't get into the unit remotely, so I went to the site and the exporter's LCD front panel menu showed no issue other than it hadn't received any

PSD (artist and title) information since May of 2021!

I knew that this was not correct. I had seen the PSD on the radio during that time frame many times. I decided we would perform a soft reboot of the exporter from the LCD panel menu. When we did this, it never came back up; it just ended up at an "initializing" point on the display. We tried a power reboot, and the result was the same. This exporter will have to be sent back to the factory for repair.

In the meantime, while I would have liked it to have made it until the actual install, we did have an already licensed and configured Nautel HD



Sofia site monitor display of the HD2 station logo, confirming that this feature is working.

Multicast+ importer/exporter ready to go. So, that is what we did – we installed the new unit.

I like the fact that the new software in the importer panel has built in MAC clients that are easily accessible so that you can load static station logos for the HD radio displays. If you want to have album artwork, you still will need a third-party software platform to feed that artwork to the importer. However, it is so much easier to get station logos on the air.

We have never had station logos on the HD2

and HD3 signals. We will now. In the photo, you will see where I am using our Inovonics Sofia Site Monitor to verify that the HD2 logo is propagating. Obviously, it is. Maybe one day I will have a vehicle with an HD Radio that has the Artist Experience built in, but the Sofia allows me to check this wherever I can get internet.

We still have two more installations to go on the main transmitters, and then we will follow up, finally getting our backup HD operations working once again.

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

Sometimes I just have to learn the hard way. The lesson I learned recently is that metal roofs get hot!

Six years ago, we installed our FM translator for KCBC. The transmitting equipment is located

about 600 feet from the main building at one of the AM towers and is too far for an Ethernet cable to connect them together. The solution was to use a Ubiquity 5 GHz NanoBridge system.

I decided to mount the NanoBridge on the roof of the main building. It was easy to do and would be out of the way. It worked great for the last six years. It died

one day a few weeks ago. I happened to be the hottest day in a very long time. Records indicate it was 110 degrees F, but I recall it peaking at around 117 degrees F. In any case, it was HOT!

In the heat of the day the NanoBridge had had enough. Now in hindsight I can see the roof was not such a good location. It is a kind of perfect storm of heat. The roof faces south at a shallow angle that puts it almost perpendicular to the sun. The poor NanoBridge was near the surface of the hot roof where the air temperature had to be extreme, plus it was receiving direct radiation from the sun and reflected energy from the roof.

At six years of age, the NanoBridge was already a vintage piece of equipment. The replacement is a Cambium ePMP Force 300-13.



Upon arrival it needed to be setup. The only instructions included were printed on the box, basically how to set the Ethernet properties on the computer and the IP address of the unit. That's all well and fine, but it didn't work.

YouTube to the rescue! I found a video of how to set up the device and I followed along. Turns out the instructions printed on

the box had the wrong IP address of 192.168.0.1. The guy in the video used 192.168.0.2, that made mine connect as well. Once connected, it is fairly intuitive on how to set up the link, very similar the NanoBridge as I remember it.

This time I mounted it on the east side of the building. It gets some morning sun, but after noon it is in the shade the rest of the day. It will be much happier in that location than it would be on the hot tin roof!

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

KLDC Move

As most of you read in my dad's column, we got the KLDC transmitter operation moved over to

the new location. It was a weekplus of long hours and hard work.

It was great being able to work, in person, with Stephen Poole. Last time we worked together in person was back in 2010 when we moved our offices from Denver to Aurora, CO. This was my first station move of this extent, so it was a learning process.

While it was a lot of

hard work it was also a fun time learning, from grabbing the old diplexer cabinets from Ruby Hill, to taking them to KLZ, stripping them, cleaning them, and building new filters/ATUs from scratch, then seeing how the tuning process works, to moving them out to the new location and putting them in place. It was interesting to get to see how some of this works.

While I couldn't help with the entire process (someone had to get the equipment in the racks), what I did experience was pretty darn cool.

The project was not without some issues. The first thing I found was the Ubiquiti link between the studio and tower site was not solid. While it looked like it stayed connected, I would see dropouts making the link useless to us. After some time, I was able to get the BridgeIT XTRA to work on our Century Link internet so we would at least have some forward error correction, getting the station audio to sound good. We did eventually get the link working (an error I caused), but it still isn't great and has occasional short "Max Headroom" spells as we get interference or fades. We are looking into our options to hopefully get a better link.

During all of this, one thing we noticed once we were operating in HD was that the station would show the PSD for the current program for a couple seconds at the start of the program before defaulting to the default PSD set up in Nexgen. We still are not entirely sure why this happened, but I did see in Nexgen that the export did not have shows or memos (comments) selected, only songs. I checked them



and got the usual warning that an ASERV restart was required. I have yet to do the restart, but we noticed right after this, the PSD started working normally.

> Makes me think that the warning is just something in the system and while a restart is necessary on some items, maybe on things like this, it can get by without it. It's been nearly four full days since I made the change and things are still looking good.

KLZ Break-in Attempt

Around 8:30 pm on September 20, as I was nearly asleep, my phone began ringing.

I answered a call from our security company telling me there is a sensor alarm at the back door at the KLZ site. While on the phone, I got on the security NVR and didn't see anything. The building is dark, and at night, the inside camera can't see too well. The door looked closed, though.

I worried a bit and kept looking for a good long while at all the cameras at the site, and when I didn't see any changes, I went to bed.

That next day was spent at the new KLDC site to continue with getting things done that were not completed the week before. I knew I needed to look at the cameras at some point to see if I could notice anything. I had looked at previous days and during the day I could see light coming around the edges of the door. So once we got back to the office late in the afternoon, I looked carefully and there was definitely a gap where a lot more light was pouring through.

I went out to the KLZ site and called my husband who would be heading home (and driving near the site soon). If there's one thing I know as a woman, it's that I don't know how to do certain things, and I knew that if this door was bad enough, I'd have trouble securing it. I knew having him meet me at the site would be of tremendous help if I found something.

When I arrived, a couple things stood out to me. The first is that there was a small Mongoose bike sitting near our gate (something we've had before). The second is that there was a broom handle



The 60-year-old back door at the KLZ transmitter site sustained substantial damage. Thankfully the burglar did not get in.

sticking out of our dumpster. I had thrown that broom away the week before, but it was in the dumpster, lid closed.

I immediately drove around to the back of the building. Sure enough, the door handle was gone and there was considerable damage to the door.

While I waited on my husband to arrive, I began looking at the security cameras. I found that on that Tuesday, around noon, a guy on that bike rode up, dumped it, hopped over the fence and walked up our drive to the dumpster. He went through the dumpster and after a while, he walked away towards the back of our property. We do not have camera coverage back there, so I don't know what he did. I can only assume. Was it him that came back later that night to try to break in? Again, I can only assume. I could not see anyone entering the property on camera around the time of the break in.

Once Jordon arrived, I showed him the damage and we (mostly he) began looking for a way to secure the door. As he messed with the door, the deadbolt just fell out, showing us just how close this person was to getting in the building. I really had no clue how we would secure the door, but his construction background helped him to figure out he could use one of the metal posts we used for a fence around the building years ago (piled on the side of the building) and drilled it into the door and frame. That would get us through the night. I also left a light on in the building so if an alarm did happen, I could look and actually see the door.

The next day, I needed to go out to get some more measurements so we could order a new door, and my dad found some long bolts to put into the inside of the door where it used to have pins to secure it (which had gone unused for over 20 years). We did get a door ordered, but it probably won't be here until the end of October.

I am grateful the person did not get in. The thing to remember about KLZ is that this is our storage site. We have shelves full of equipment and components. A workshop with many tools and a ton of copper. A garage with a truck and tractor (keys to both in the building). And so much more. Some serious damage could have happened. We think, because the siren is right above that door that as soon as the alarm went off, the person fled.

As it is with any security breach, you learn and determine what else could be done to possibly prevent a break-in or catch a person who breaks in. The one thing we thought of and have ordered is a security camera to look at that back door. I also have plans to replace the cameras at the site. They had been ordered and delivered weeks before and have been at the site awaiting me to install them. The issue was KLDC. Some things have to take priority, and that project had me tied up for all of September.

The new 4k camera should be in shortly (likely before you read this), and the plan is to spend a day at the site (maybe multiple sites as I plan on replacing many cameras at the locations) and get the work done.

Some Upcoming Things

With leaving some of the fluorescent lights on at the KLZ site, and with several of them beginning to fail, I have been wanting to convert to LED. We could use some good, bright lights in the building, plus with the number of light fixtures in there, it would be nice to go to LED and not have to worry (too much) about them again. After discussing with Todd Stickler at KBRT, who has been converting their office lights to LED, I knew what I needed to order and what I needed to do to be able to convert those lights. I have purchased the LED replacement tubes and when we go to the site to work on cameras, I also plan on beginning this work.

As mentioned, I also have plans to replace many of our security cameras at the sites. In the last

year, many of them have begun showing signs of sun damage. Some get fogged easily (even with a desiccant bag inside), and on others the cover on the camera has turned yellow and created a haze on the lens which you cannot get rid of. Some of the PTZs no longer focus without a daily (sometimes multiple times a day) reset.

I ordered what we needed a month or so ago and have the cameras at each site ready to go when I am able to make the time. I look forward to getting this done. We have replaced a PTZ at the KLVZ site months ago and the camera on the barn (looking at the main gate) at KLZ with new 4K cameras, and the quality is amazing! Sometimes you don't know what you're missing out on until you do have to replace a camera. Not that the image before was bad, but the way they are constantly able to upgrade cameras to get better and better pictures is remarkable.

One other thing of note is a bit bittersweet. Keith Peterson, who has been assisting me since around 2009, will be stepping down from engineering responsibilities. His health is keeping him from being able to do the things he once did. He will continue with the company working on our websites. I will miss working directly with him as often. We are in the process of hiring his adult son, Seth, who has been helping his dad for the last couple of years, with the physical work. I realized that I can't do it all. I have an office with things that need attention often and five transmitter locations, three of which Crawford owns and maintains. The tasks are so great that there is no way I could ever keep up. Seth will be a huge help with keeping the sites cleaned up and maintained, as his dad was.

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

KBRT • Costa Mesa - Los Angeles, CA 740 kHz/100.7 MHz, 50 kW-D/0.2 kW-N, DA-1 KNSN • San Diego, CA 1240 kHz/103.3 MHz, 550W-U KCBC • Manteca - San Francisco, CA 770 kHz/94.7 MHz, 50 kW-D/4.3 kW-N, DA-2 KLZ • Denver, CO 560 kHz/100.3 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



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