The Local E Oscillator

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Like every season once a person reaches a certain age, the summer of 2021 is passing with great speed. The pressures of summer projects ramp up as

the inevitability of the coming winter looms ever closer. And yet, in most parts of the country, the autumn months are periods of excellent weather, so we still have some time to deal with outdoor projects before the snow flies.

C-Band Repack

Several months ago, we purchased and shipped out "Phase 2" repack filters for all our C-band downlinks. While we don't need those in place until the end of 2023, we should go ahead and install them now for a number of reasons. One is so that you're not scrambling at the last

minute, standing on a ladder in the middle of a snowstorm, trying to keep the snow out of the waveguide while your frozen fingers drop hardware into the snow. Another is so that you won't be hunting for the filter as the deadline approaches and you can't remember where you put it.

Still one more reason is that there is some insertion loss - 0.5 to 1.5 dB, depending on a number of factors – and if your LNB is weak or your antenna needs tweaking, you'll want to do that now, without time pressure, as opposed to in the middle of that snowstorm. So let's get those repack filters installed now and evaluate their effect on reception.

KLDC Relocation

In prior issues I wrote about our plans to relocate KLDC (1220 kHz) from the existing site on Ruby Hill to the KLZ transmitter site because the Ruby Hill site owner is planning to take down the



tower and sell the property. Moving KLDC to the KLZ site would have made for a compact, efficient collocation of three of our Denver radio stations at a

single site. Last month, however, as the quotes for materials started coming in, we got a dose of 2021 reality – the cost of relocation would far exceed the value of the radio station. Filters, detuning networks, switch gear, phasing/coupling equipment, transmission and sample lines, tower and ground system plus installation and tuning of most all of the above were going to cost far more than we could justify. So the search was on for "Plan B."

We found a 205-foot tower just a little over a mile south of the existing site that was once the home of the station, several years before we

bought it. The tower is 90 degrees high on 1220 kHz and the ground radials are also 90 degrees on 1220. The site is currently used by KGNU, 5 kW on 1390 kHz. We are at present talking to the KGNU folks about a lease.

If we can come to an agreement, we will take the existing 1220/1340 diplexer from the Ruby Hill site and reconfigure it for 1220/1390. The filter components on the 1220 side will have to be upsized to deal with the higher power on 1390, and the ATU components on the 1390 side will also need to be upsized. The existing cabinets should work just fine. We should see 78 dB of isolation on both sides with about a quarter dB of through loss.

It appears on paper that we have a clear lineof-sight from the Denver studio rooftop to the KGNU site, but because of persistent haze from western wildfires, we haven't been able to confirm that. Our hope is to move the existing link with an antenna on the transmitter building roof, but if we need more height, we would plan to put the antenna 100 feet (or so) up the tower and use a CAT5/6 isolator to couple Ethernet and PoE onto the tower. The isolator made by Kintronics provides two cables, so that would leave one for KGNU if they want to use it.

In addition to the lease, there is one other thing that we need to resolve before we can move forward, the ground conductivity to the south. There is a first-adjacent channel station down in Pueblo on 1230 kHz. When our 1220 was on the KGNU tower back in the 1990s, there was overlap with that station that was grandfathered. When the station moved to the north a little over a mile, it had to reduce power both for the higher efficiency of the taller tower on Ruby Hill but also to keep from increasing the overlap to a station on 1210 kHz in Laramie. When it did that, it lost some of its grandfathered overlap status to Pueblo. As such, when it moves back to the KGNU tower, our 1220 will be limited to 840 watts or so... that is, unless we can measure ground conductivities that are lower than the15 mS/m that is shown on the M3 map.

I'm fairly confident that the measured conductivity will be lower, and hopefully that will allow us to get a full kilowatt at the new site. But we won't make any measurements until we are sure we will get lease terms that we can live with.

Obsolescence

That sounds like a term I might apply to myself, but in this case, I am talking about handheld GPS units. We have for several years used a Garmin GPSMap60C for establishing exact location or staying on a radial when making field intensity measurements for proof or determination of ground conductivity. It was slick... using the accompanying Garmin MapSource program, I could create waypoints for the site and radial ends, then create "routes" between radial ends and the site. Navigation was a snap. When on the magenta line, you were on the radial. The "Off Course" field would show how far, in meters, you were off the radial (I would always shoot for zero or very close to it), and the "Dist. to Dest." field would show the distance back to the station or antenna.

A few months ago, I got a new W10 notebook computer, and when I installed MapSource, I found that I was unable to find a USB driver that would work with the GPSMap60C handheld. I searched the web for help, then called Garmin support... and found out that I am out of luck – the GPSMap60C is "obsolete and unsupported," there is no W10 USB driver, and MapSource is no more. I had no choice but to upgrade to the current model GPSMap64SX.

That aggravates me. There is nothing wrong with that older handheld. I own one myself that we use when ATVing in the back country. Good thing I have a W7 machine at home to which it will still "talk." And I could take the old 60 home and do all the uploading from there (and I probably occasionally will, just to extend its life), but I need a way to do it from the office as well.

The point is, Garmin obsoleted the 60 for the sole purpose of selling more \$300 handhelds. It uses the same interface and, as far as I can tell, the same data protocol as the newer units. The only thing missing is the W10 USB driver. How hard can that be to produce?

How often have we seen manufacturers do this very thing, ending support for a piece of perfectly good equipment and making it obsolete? We saw it with the Digigram sound cards, which were insanely expensive in my opinion, and this kind of thing continues.

In some ways I get it... manufacturers could well put themselves out of business if they built equipment that lasts forever and continue to support it indefinitely. But my suggestion would be to take a lesson from Apple: come out with a better product every couple of years with more/better/bigger features while continuing to support the older products. I daresay that model has worked very well for them, and it will work for manufacturers like Garmin as well.

I might point out that the cockpits of most of the aircraft that our club flies are equipped with Garmin avionics, and some of those devices are 15 or more years old... and still supported. Last year we did firmware updates to all our Garmin 430 and 530 aircraft GPS units. And every year or so, Garmin comes out with some new products that would replace the older units – but they don't have to because the older units are still supported. So... it's not as if this model is unknown to Garmin. They just don't employ it in their consumer handheld and automotive product lines.

The good news is that we now have a shiny new GPSMap64SX for which there is a W10 driver and compatible PC software in which I can create waypoints and routes, so we're back in business. For now.

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

Hello to all from Western New York! Chances are, wherever you are located, you have experienced Mother Nature at her worst! The month

of July seems to have unleashed the worst possible weather that we have seen on this continent in years! With everything from massive wildfires to extreme heat, massive flooding and drought conditions, each corner of the U.S.A. has seen at least one of the above.

Here in the northeast, severe thunderstorms and massive downpours have been the

normal as of late. Fortunately, all of our sites in Buffalo and Rochester have been spared any substantial damage from these storms, but that is not to say that we have had our moments.

As July rolled in, on the 2nd, we had a storm roll through that knocked commercial power off at the WDCX-FM transmitter site for a short time. Our 50-kW generator kicked in immediately when the power went out, keeping us on the air at least in analog. Our digital services went down when the first outage hit, warranting a trip out to the transmitter to restart the exporter and importer for our HD-1 and HD-2 streams. After restarting the HD services, I looked the transmitter plant over for any additional damage and was quite pleased to find that everything else was in perfect working order.

While traveling back home, the same storm that had knocked power out at the FM site, hit our AM site in Hamburg, NY. It was not long until the remote control began calling with off-air alarms and loss of commercial power. Detouring my trip home to the WDCZ transmitter site, I drove through some of the hardest rain I have seen in years! At one point, I had to pull to the side of the road, as the downpour made visibility almost zero.

While waiting out the torrential rain, I tried to bring the Harris DAX-5 transmitter up via remote



control, with no success. I knew this had to be something serious, as the last six-plus years we have owned this facility, we have been off the air only

once.

Upon arriving at the site, I found the Generac generator running full-bore, but within minutes, commercial power was restored. Upon entering the building, my nostrils were hit with the sickening stench of burnt electronics, so I prepared myself for a long night of troubleshooting the problem.

After firing up the auxiliary transmitter, I began

troubleshooting the DAX-5 failure. The controller panel was completely dark, which indicated loss of the low voltage supply. I first checked the +48 VDC supply and found it to be operational, so I turned to the +/- 12 VDC / +5 VDC supply and found both to be dead. I had a repaired spare on hand, so I swapped out the supply module and the transmitter came back to life! We dodged a bullet on this one, however the blown supply was cooked to a crisp, making rebuilding the module impossible.

Fast-forward almost two weeks to the 15th when again, we lost power at the WDCX-FM site. As the generator kept us up and running as I traveled out to the site, I could only imagine what I would walk into when I arrived at the site. Upon arriving, I immediately noticed that two of the fused links on our power pole were blown, which meant that when commercial power was restored, we would still be without power. I phoned NYSEG, our electric utility, reported the issue at our pole and requested a site visit from someone in the repair department. Surprisingly, not more than a half-hour later, a bucket truck showed up in our driveway! After a few minutes he gave the verdict of what happened, we had two blown transformers. Talk about a blessing in disguise! I have been after NYSEG to replace those

transformers for almost five years! They were over 50 years old!



Three new "pole pig" transformers at WDCX-FM.

We had nearly a full tank of diesel fuel in the generator, so I got comfortable and began to ride the night out at the transmitter site. It was about 10 PM when the crew showed up from NYSEG and began removing the old transformers and coming up with a plan on how to rebuild the service pole. They basically had to strip all the old components from the pole, as the mounts that hold the transformers were completely different, and the cross Ts had to be rebuilt also as the old fused links had to be replaced. By 2:20 AM we were back up on commercial power with three new piggies, shining like a new nickel! I hung around until 2:45 AM to ensure that everything was stable, then made the long trip home to get some sleep.

On Sunday afternoon the 18th, RCS support and I performed a system upgrade of the NexGen OS for WDCX-FM. We were several upgrades behind, and with our NexGen training session quickly approaching, we decided that the upgrade needed to be done before our scheduled date of the 27th for the refresher training session. It took about two hours to complete the upgrades, and I am happy to report that we experienced no side-effects from the system upgrade.

We still have a couple of computers running on XP, and I was concerned that with the OS upgrade, they would not play nice with the rest of the system. As of this writing, we have not experienced any anomalies with the NexGen system.

The refresher training session with Samantha at NexGen went well on the 27th. We had a total of six persons sitting in on the session, four from Buffalo and two in Rochester. I can say that all of us came back from the session learning something new, or ways to utilize differently many of the software features of the system. In my opinion, this training session was money well spent, not only from a maintenance standpoint, but the daily operators now have a better understanding of how everything works, saving them (and ME) time.

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, social distance, and happy engineering!

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

Hot and Cold

I've been slowly upgrading thermostats at our transmitter sites and studios. I see the thermostat

as an inexpensive first step in combating inefficiencies in our heating and cooling systems.

It all started when the unit that fed my office failed and I got frustrated by its oddball thermostat. One winter morning I arrived at a 58° office! Spring turned into summer, and I had lots of people complaining about it being too hot. Once again, that balky thermostat refused to let me change its setpoint (and I have the manual!). I decided to ditch it and replace it with my regular go-to formerit the Furthermostat

favorite; the Emerson Sensi Wi-Fi thermostat.

I'm sure everyone is familiar with Wi-Fi and programmable thermostats, but you may not realize their value within a broadcast facility. More than once I've walked into a broiling hot or below freezing space, and heaven forbid if it's a transmitter room or TOC! After one 110° double A/C failure, I had an engineer joke that if that ever happened again, I could find his resignation in his top desk drawer. It never happened again.

Staying ahead of HVAC is a big part of our jobs and it's none too easy. HVAC is a perpetual battle where one must know thine enemy.

Monitoring is crucial. The Sensi Wi-Fi thermostat is a perfect ally in this fight because it lets you know via email should an HVAC zone become too hot, too cold, or too humid. It also lets you set up programs that save gobs of energy – why not save heating and cooling the sales area on a weekend or holiday? Sensi will return the space to a comfortable temperature well before the staff arrives on Monday.

For a transmitter room I've used them to lead/lag our redundant rooftop units by setting up mirrored schedules where one unit runs on Monday, the other on Tuesday (and so on). This distributes the wear on the units and proves that they are both operational. Adjusting their programmed setpoints can easily allow one unit to cover for the other in the event of a failure or even bring both on should there



be a significant load such as having to simultaneously run multiple transmitters.

Sensi comes with a usage report that lets you see the usage time of the unit it's controlling which is

sometimes eye opening. I could barely believe that at one of my transmitter buildings, the northwest A/C unit ran nearly 158 of 168 hours last week! To be fair, there is a 50 kW transmitter inside, but we may want to think about insulating to reduce some of the solar load.

Sensi also lets you lock the front panel, and of course sends you an email should temperature or humidity stray too far from setpoint. It'll even run the A/C to correct for high humidity in the space. No

wonder it's PC Magazine's "Readers' Choice."

Internet from the sky?

When a service you rely on gets discontinued, it can leave you in a terrific bind. Recently, the provider of T1 service to one of our transmitter sites announced the sunsetting of their copper-delivered services, meaning we'd lose our backup STL path.

We considered our options, which included doing some seriously expensive trenching or directional boring from the main road alongside our two-track, which runs half a mile through the woods to the transmitter building. Hardly ideal.

For one service we considered, we'd have to supply and bury our own fiber and take their circuit handoff at the road where we'd locate a solarpowered enclosure for their modem and our FOC media converter. Yikes!

I've written about this before, but now I have a solution to share which cost nothing to install and delivers internet speeds that just a decade ago were impossible, even with cable supplied broadband service. Of course, this service is asymmetric, but upload speeds are rarely a concern at transmitter sites. The solution we chose was from Viasat, and it supplies unlimited data at 35 mbps down and 4 mbps up.

Viasat supplies internet service to marine, aviation, and defense customers as well as rural



residential and business users. Ever wonder how your cruise ship gets internet, or how you can get it on an airplane?? Viasat uses a combination of low-earth and geostationary satellites that cover a vast area of the earth. As impressive as that is, they are deploying three more satellites

each with a capacity expected to exceed one terabit

per second, which will deliver users with 100+ mbps data speeds globally in the near future.

We've installed Viasat at our two most remote transmitter sites, replacing DSL and T1 circuits. Their service is ideal for STLs, too, because Viasat hooks up its business customers with persistent IP addresses, meaning your router's address will stay put for up to 14 days should it become disconnected. Readdressing codecs isn't a worry after a power failure or other outage at the remote site. I tried everything I could think of to tripup the system, but even after undoing the coax, my Tieline codec restarted the audio streams within seconds after I reconnected it and the Viasat modem resumed communication with the network.

Do be aware that if you order it for business usage, their modem stays locked in bridge mode, so you'll have to supply a router and a Wi-Fi access point (that gets disabled too), but you'd probably want to do that anyhow.

C|NET says Viasat is the best satellite provider, and so far, I'm super happy with their service. Two thumbs 22,236 miles up!

News from the South by Stephen Poole, CBRE, AMD Chief Engineer, CBC–Alabama

Another wet month in 'Bama Land. As I write this, the immediate storms have drifted to our South, but now we're under the same heat index

warning that some of you folks out west have been enduring. The expected index in the Birmingham area today and tomorrow is in the 105-100 degree range. That's a tad warm, even for 'Bama.

101 in Cullman

The site that has suffered the most from this latest round of storms is 101.1 FM in Cullman, WXJC-FM. I had initially thought it was a lightning strike, but after further

investigation, I determined that the problems were caused by one of our air conditioners. The AC units (there are two) have been running wide open, of course, because of the heat. This particular unit had a bad high-pressure switch, so the compressor kept running up head pressure, then finally failed with a short.

The way high-efficiency AC works (or so I'm told) is to run the coolant pressure as high as you



dare, basically letting it "climb" until it hits the "ceiling" imposed by the high limit switch. In many high-efficiency units, the outdoor fan on the condenser won't even turn on until the pressure has reached some high level. If you lose the control circuits that keep it from going too high, though, the compressor will eventually fail. If you're as old as I am, you remember being told many years ago that you needed to wait a few minutes before turning an AC back on. Flickering power killed

many a unit back then.

Anyway: the compressor in that unit went shorted, which tripped the breaker. Unfortunately, the power to entire the building flickered madly for a second or two before the breaker opened the circuit. How many times have we discussed this?

Even some top name brand UPS units just can't handle brief "flicker" outages. They use a simple thermistor arrangement to control current inrush, and once it heats up, it's useless against a second or third surge. That's what I'm guessing happened here, at any rate.

The UPS got confused and shut down, taking us off air. I had run to Cullman and at first, I thought we'd lost several pieces of equipment. But then I noticed that a large section of the rack was dark; I went around back, reset the UPS and it lighted back up. Yay – to a limited extent. I had also feared that we'd lost the two APT codecs that we use to deliver audio to the site. One of them was indeed dead, but Todd was (eventually) able to restore the other unit, allowing us to at least have the main HD channel. In the interim, we operated on a combination of the Spectrum link and WDJC's HD2 signal. Whew!

Now for the AC unit. We've had the compressor replaced, but the pressure remains high. We're going to call in another repair crew, one with more experience on these units, to replace the highpressure switch and make sure that things are kosher.

Oh ... if the constant heat in Alabama isn't hard enough on air conditioning units, remember that we also have Bubba with his rifle. Figure 1 shows what the other unit – believe it or not, the one that still functions! – looked like after a stray shot from said rifle hit the condenser coil. Thank the Lord the tubing wasn't pierced. Bubba managed to crease some fins, and that was the limit of the damage.

A Dead Moseley Link

Now, I can't complain. These units have been in constant service for more than 10 years. I'm talking about the old late-90s era Moseley PCL6000 and DSP6000 combinations that allowed you to send four channels of uncompressed, digital audio, over a single 950 MHz composite STL channel. I am intimately familiar with them in all sorts of configurations, too.

In the past, I've used both two- and fourchannel units over T1, with Adtran modems and gnarly-looking V.34 cables. That's when I became very familiar with the little capacitor that you see in Figure 2. If you've ever aligned one of these, you know exactly where he is and how to tweak him. In fact, if I lose lock on an older DSP6000, I can usually diddle that little fellow and get it back up. We finally surrendered our last T1 to the telcos some years ago, so the Moseleys are being used in the more common RF STL arrangement now. But that capacitor still gets diddled from time to time. It just so happened that about the time that 101 went off air, the Moseley four-channel link that we use as backup from our studios to the WDJC site on Red Mountain had also failed. We were getting very (ridiculously) heavy rain and high humidity, so the 18 GHz Cambium link from the studios was suffering some dropouts. Normally, our equipment will switch to that Moseley backup automatically.



Figure 1 - A stray bullet from Bubba hit this AC at 101.1 FM.

WDJC is a very important station, so I've arranged things such that the Cambium link, supporting a Tieline codec, is the primary audio source. The main channels on the Moseley are the analog backup to our Omnia.11 processor. But without the Moseley making music, when the Cambium would drop out, our on-air signal would drop to dead air. Very annoying and un-good.

As I write this, we're still trying to revive at least one older Moseley DSP6000 to get that link back up and in service. [The unit has been repaired and is back in service at press time – Ed.] I've already told Todd and Jack that, worst case, we can use a Vorsis processor at the studios to feed an oldschool analog composite up to Red Mountain through the Moseley PCL6000s, to at least keep WDJC on the air. But given that Red Mountain is the main distribution point for all of our STL signals, this is a very high priority and we're working on a solution now.

A New Web Server

This took a bit longer than expected. Cris and Amanda installed the new server in Denver, and it was working fine. However (long story, not going to go into all of it), the CentOS Linux distribution

that we've always used in the past is being discontinued, so we opted to go with genuine Red Hat Linux Enterprise 8 (capitalized with the utmost reverence). CentOS is essentially a clone of Red Hat and has worked quite well for us over the years. But we decided to upgrade to the for-real thing.

Cris and Amanda did a great job installing Red Hat, and even set up the basics for a good server. It was exposed to the Internet with SSH, so I got to work. That's when I discovered that (as usual) (make that, "as always") Red Hat has changed a bunch of things from version 7 to 8. The biggest had to do with the software package management, and the fact that we were now using a new variant of the PHP language that all of our Web sites require. Again, I won't bore you with all the details.



Figure 3 - If you've aligned a Moseley DSP6000, you know this fellow.

At any rate, Keith Peterson and I started migrating all of the sites from the old server to the new. My job was basically to give Keith the platform; he did the heavy lifting, moving all of the data over and restoring it. We expected a few glitches, but we had more than usual this time. Keith and I have become fairly good friends via email and text. I'd post some of our discussions here, but ... well, just NO.

Anyway. We've discovered that some of our websites are horribly bloated and overloaded. There are old files in there that haven't been used in years. We have duplicate "plugins" (added features to the basic WordPress platform) that conflict with one another. Something – I suspect one of the common plugins – keeps changing the file permissions on everything, requiring that I go in and run some "chown" and "chmod" commands to fix them. Fun, fun.



Figure 2 - I was forewarned, so I didn't stray inside.

But we finally got all of the sites up and running. We still encounter glitches here and there – that's going to happen, especially with WordPress (don't get me started on that). KKPZ is currently dark, so we killed its WordPress site and Keith created a simple, single page with a link to our public file and other required information. The automatic update feature on WMUZ doesn't work for some inexplicable reason. A lot more work that we expected, but then, that's about what I expected. If that makes any sense.

(And in fact, as I finish this up and am about to fire it off to Cris for editing, I see I have received another email from Keith about the web server. Ah, life goes on, as expected.)

And Finally ...

So much to do here. We've been dodging storms (and flooded streets) (and downed trees) for so long, it has become second nature. But cleaning up, replacing fuses, resetting breakers, checking for roof damage and all the other things that one must do after a storm has put us way behind. We still need to get the Spectrum internet up at 850 AM, WXJC. The ones at 101.1 and 1260 (WYDE AM) are working like a champ, and I have high hopes for 850 as well.

But you know me; I look for humor where I can find it. Sandy had a doctor's appointment in mid-July at UAB downtown. The parking lot at this particular clinic is almost always full and closed, so I just find somewhere else to sit and wait for her, then go pick her up when she calls. While driving back to fetch her, I saw a construction barrier that just screamed, "Creature," over and over (Figure 3).

One can only guess that the reverse, facing said creature, reads, "food! food!" (or something like that).

Until next time, keep praying for this heartsick nation!

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

Generator/Flywheel Combination

Our Burnham, Illinois, transmitter site features not only a generator but a flywheel UPS. The

UPS provides not only a transition from the initial loss of utility power until the generator is running and online, but it also covers those one or two second outages which are not long enough to cause a transfer to generator but are long enough to take your transmitter down for a bit.

The flywheel UPS reacts quickly to these outages, but the one drawback is that it will only carry the load about 45 seconds. This may sound like plenty of time to get to the generator, but there have been times when the generator just wasn't ready recently.

This happened back in June. The generator wasn't handling the load, and due to under voltage and low frequency power conditions coming from the generator, the UPS held off transfer until it no longer had any energy left to hold the load itself. This resulted in the transmitter dropping off air until the generator could handle the load.

Since it's been almost seven years since this happened before, we got our generator service company involved. We did a load test with the generator tech connecting his laptop to the generator while I pulled the main power from the utility. When this took place, we did see the transfer to the generator and the generator definitely bogged down under the load, then revved up. This did cause some variation in the transmitter and the UPS eventually lost its energy and went off line.

Trying to figure out what was causing the issue of course resulted in finger pointing. The generator tech showed that we were definitely at times over the load rating of the generator. It is a 100 kW generator, and our normal load is about 80 kW. The most likely cause for the load being higher is that in addition to the normal load, the flywheel UPS has



to restore its energy by revving up the flywheel. Now these type conditions have been a part

of this setup for the almost eighteen years of its existence. So what is the difference now?

> We could point to the age of both units. Truthfully, that could be a factor. One item that got my attention is that they had changed out the LP gas regulator on the generator back in December due to start issues. Now, during the load test, the tech also put gauges on the fuel system and did see that our fuel pressure is on the low side. This is due to the fact that we use propane, and it's in a liquid state until it reaches that regulator. There is certainly a factor in the conversion to gas that plays a part in this.

My question is still that the generator, although it has always started slow due to being fueled by propane, was handling the load. Why is it having trouble now?

My next question was, when was the last time a tune-up was performed on the unit? At first, the tech balked at doing this, thinking it had been about five years since it was last performed, but when we actually found the records, it was twice that! So, it was definitely time to do that. Once I saw the spark plugs that were in there the last ten years, it was obviously at least part of the issue. The tech also brought a load bank with him so he could do adjustments on the unit under various loads without us having to be on the actual station load.

Short of us having to purchase a new generator with more capacity, I have been trying to figure out ways to make the current situation better.

For one, the main reason we bog down the generator is that the load plus the re-energization of



The 150 kVA 480V flywheel UPS at the Burnham site is inside this stand-alone, self-contained enclosure.

the flywheel UPS momentarily takes it above the rating of the generator.

Now that we have an auxiliary site for the station at our Lansing transmitter site, it is really an ideal way to put that to use. I have set up a macro in the Burk ARC Plus Touch remote control that will transfer the station to the auxiliary site transmitter moments after the generator goes on line. This will hopefully happen before the flywheel UPS completely runs out of energy.

The thought is that by getting the transmitter off the load equation, the flywheel UPS can recharge itself and not put the load of the generator over its rating. Then after ten minutes, the macro will turn the main transmitter back at the main site if the UPS is online. I figure that is the best way to know the UPS is no longer adding to the load.

The other item I am looking into at this point is to see if we can switch to natural gas as the fuel. It is my understanding that natural gas provides a quicker start than propane. I have noticed with our own generators that the natural gas units seem to fire up quicker with a cleaner sound. The two units with propane seem to take longer. It was also recommended by the tech as a better method under our circumstances. Availability along with the cost of the move will play big factors in that decision.

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

AC/ Cooler Maintenance

It is so easy to forget about these units. They sit on roofs typically, maybe in a window on

the side of a building. But out of sight, out of mind. We do our best to keep up with the filters. The AC units are a bit easier, with the exception of KLVZ, where both units are high off the ground, and difficult to get to even with a ladder.

The high-tech BreezeAir cooler at KLZ is a different story. The pads should last a few years at least. They can't be bought at Home Depot.

You have to order them from a vendor. I had gone out to the site after noticing the unit, while cooling, wasn't being very efficient. I could never hear any change in fan speed when we adjusted things, and the temperature stayed in the upper 70s.

When I got up there, I found the belt had finally given out and was barely hanging on. I had



bought several a few years ago and keep them in a marked box on a cabinet. Once changed, the unit started blowing hard again and the temperature stays

around 68 degrees.

The two AC units on the building at KLVZ usually give us issues each year. We aren't able to keep up with cleaning and, as mentioned above, since this site is in a flood plain, the building is up high on pylons, meaning the units are even higher. Trying to maneuver on a ladder to replace filters or clean things up is very difficult.

I have been getting "AC

Fail" alarms at this site on and off all season. The first time, I went out and did a hard power cycle using the breaker, and the unit came back up with no issues. The next time, we actually had a power outage shortly after that cleared the alarm. But on a trip to the site to do some maintenance, I could hear the compressor continually running. I was able to get a service company out to look at it and the tech found a leak and a stuck compressor contactor. I had already discussed the issue with him and told the tech that I wanted the unit cleaned as well. I want to make sure it is in good shape. He spent the entire day at the site getting the unit cleaned and fixed.

We haven't had any cooling issues at KLTT, which I may regret saying. Typically, by this time, we have had to make a call to get a repair done. If it holds out the rest of the season, I will most likely do a good cleaning of both units myself. The AC units at that site run most of the year due to having a 50 kW transmitter. It doesn't get used much in the winter anymore, but the other nine months of the year it gets a good workout.

Back to my main point: maintenance. It is so easy to overlook. You almost need to create a checklist of the various things to look over each week, bi-weekly, monthly, yearly so things don't get forgotten. I know maintenance cannot prevent an issue – sometimes things just happen. But making it a point to visually check the AC and coolers at your sites can help ward off a problem. I know I need to be better at checking often the state of our filters/pads and I for sure need to do a better job at keeping the units cleaned up.

KLVZ Exporter Plus

Late on a Sunday night we had a power failure at the KLVZ transmitter site. Not a big deal as we operate from a different site at night. But the next morning, upon arriving to work at 5:30, I noticed an issue. At 5:45, we should have gone back to the main site. I checked, and sure enough, the transmitter was "ON" but not putting out power. I began troubleshooting and ended up having to go to the transmitter site.

At the site, I found the Exporter Plus was DOA; I could not get it to turn on. Unfortunately, this transmitter does not have two exciters, so we had to dig into the manual and be reminded how to convert the transmitter back to analog. We were able to get it done and get the main site back on the air.

I brought the exporter back to the studio for further testing, which went quickly. The power supply was done for. We contacted Nautel, who had some issues getting things figured out. While they still sell these units, they have updated them a bit over the years. They no longer sell the power supply that we had in our unit, but they were able to find something that will work.

We went ahead and ordered the power supply. It took a couple days to come in thanks to

customs, but once in, installing it was easy. We went to the transmitter site and were able to get it put in and working. We had to convert the transmitter back to digital and have been back to HD operation ever since, which made some listeners happy (we did get some calls). I am grateful to Nautel for their work at getting us this power supply so quick.

Lightning Damage

KLZ is without a doubt the most stable of all our transmitter sites. I rarely have an off-air issue. One evening late last month, we had some random monsoon storms come through and move slowly through the area. We figure one such storm must've parked over the tower site.

I was informed of the station being off air, but looking at the radar, I figured it was most likely a rain fade on the 11 GHz microwave link. After a bit, things didn't come back and radar showed the storm had moved on. After trying all I could remotely, I ended up dragging my husband with me to the KLZ site. It was fairly late and I really don't like going to any site alone at night.

About the only thing for me to do was physically turn the breaker for the tower off and back on. While on the drive out, I also noticed that east tower had only one set of tower lights working and even then they weren't flashing in sync. Two towers with issues, and I was unable to fix either.

I called Derek Jackson to see if he was available for a climb the next morning, and he was. I knew I needed to get some supplies together for the climb, so I made a late-night trip to the office to get a spare microwave radio. The box had a spare power supply in it.

What I forgot in my half-asleep state was that the power supply that came with the Cambium is very RF sensitive and would not work up on that tower. I had decided not to grab the Omron 48V DIN-rail power supply because I could not remember this. It wasn't until I was trying to sleep later that it all came back to me... It was a late day working at KLZ when we had the dishes and radios replaced, and I remembered the climber got on the ground and we could not get the radio to work with RF on that tower from KLZ. That's why we bought the Omron 48V DIN-rail power supply, which was well RFI filtered and shielded. So at 3:30 the next morning, I got up and went to the office to grab that spare Omron supply. This allowed me to get to the transmitter site at 6AM and have everything ready to go. The issue was indeed the power supply, and replacing it got the microwave link back up in short order.

The strobes on the east tower just needed a fuse replacement on the power supply for the top LED strobe/beacon. That top beacon is the master and supplies sync to the two side fixtures. Once it was working again, all levels were again flashing, synched and clear of alarms.

Vacation

It is August and I am so glad that my yearly weeklong vacation is almost here. We will be leaving August 7 for the San Juan Mountains of southwest Colorado. It will be a full week of rest, relaxation, ATVing, fishing, and anything else we may want to do.

I look forward to being somewhat unplugged from the real world (unless they finally have LTE cell service). The last three years Keith has run into issues while I've been gone. Two years ago it was phone system issues, and another year, a NexGen computer cratered.

In preparation for being out of touch for a few days, I am doing everything I can to make sure all is in great shape. I am currently working on my list for Keith. Since he doesn't do too much actual troubleshooting when things go wrong, I need to try to explain what to do if certain things happen. Make sure he has various account numbers for internet and phones, get an up-to-date IP list to him, and so much more.

This is also a good opportunity for me to make sure things are how I like them. So far, I have found one site modem I cannot get into, and at another site, a Barix unit that isn't receiving audio. I have a list of things to do and fix, and my prayer is that this year, things will go smoothly.

That about covers it for this month. I pray you all have a safe and wonderful August!

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 KKPZ • Portland, OR 1330 kHz/97.5 MHz, 5 kW-U, DA-1 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 • Cullman - Birmingham, AL 101.1 MHz, 100 kW/410m AAT WXJC • Birmingham, AL 850 kHz/96.9 MHz, 50 kW-D/1 kW-N, DA-2 WXJC-FM • Cordova-Birmingham, AL 92.5 MHz, 2.2 kW/167m AAT



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