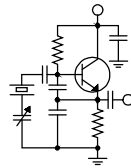


# The Local Oscillator



*The Newsletter of Crawford Broadcasting Company Corporate Engineering*

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DECEMBER 2019 • VOLUME 29 • ISSUE 12 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR.

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## **All-Digital AM**

Late last month, the FCC released a Notice of Proposed Rulemaking addressing All-Digital AM Broadcasting as the next phase of the Revitalization of the AM Radio Service. We had heard rumblings over the past month or so that this might well be in the works, and indeed it is. The chairman is, to some extent, behind it, so it has some momentum.

This NPRM is the result of a grassroots effort by Bryan Broadcasting, which filed a petition last March to allow AM broadcasters to implement the all-digital mode on a voluntary basis. We filed comments in support of this, and those comments were referenced in a couple of places in the NPRM.

A good number of questions were raised in the NPRM. The FCC clearly recognizes the problems plaguing the AM broadcast medium – noise, noise and more noise, mostly manmade; the ready availability of higher-fidelity alternatives; and interference, particularly at night. It also recognizes that all-digital operation can overcome much of this, putting AM stations on an even footing with other sources for those with HD-capable radios. This all stems from the experimental testing done by Hubbard Broadcasting and several manufacturers at WWFD in Frederick, Maryland. Those tests, which continue to this day (and were featured in the October issue of *Radio World Engineering Extra* with a follow-up feature to come out in that publication this month), were a real eye-opener as to the potential of all-digital AM.

Two major conclusions came from those tests. One is that robust digital coverage extended to the daytime 0.5 mV/m contour and beyond, and the other is that nighttime all-digital performance was good to the nighttime interference-free contour. That is more than we can say about the analog day and night coverage of most AM stations, which suffer from manmade noise even inside the 5 mV/m

contour. As such, we have learned that the MA3 all-digital mode is viable.

Another consideration in all-digital AM is that the primary digital subcarriers are contained within a bandwidth of  $\pm 5$  kHz. In other words, the primary digital subcarriers in the MA3 mode occupy the same spectrum that analog AM signals now occupy; they do not extend into adjacent channels or require additional antenna system bandwidth as the MA1 hybrid digital mode does. That means that most antenna systems will be able to pass the MA3 primary digital subcarriers, and that's great news for stations with bandwidth-challenged antenna systems or multiplexed operations.

If a station wishes to transmit ancillary data using the secondary (upper) and tertiary (lower) subcarriers, those will occupy the spectrum between 5 and 9.5 kHz on either side of the carrier frequency, but at -30 dBc, or 5 dB lower than the primary digital carriers in the MA1 hybrid mode. Evidently that is one of the areas in which WWFD struggled, presumably due to antenna issues, and that may be an issue for more bandwidth-challenged facilities.

So the good news here is that interference to adjacent-channel stations would be much less with MA3 transmissions compared to MA1 hybrid transmissions.

As with any change to a long-established medium or way of doing things, there are those in favor and those against, and there are pros and cons. In the pros column we have greatly improved noise immunity, high-fidelity stereo audio, and PSD song/title and other ancillary data. In the cons column we have incompatibility with analog receivers and a number of unknowns, such as how all-digital transmissions will perform in the presence of co- and adjacent-channel all-digital interference. Those questions will only be answered if we actually try this

thing out here in the real world with a good number of stations.

And then there is the “never-digital” crowd, which approaches the all-digital question in much the same way as the “never-Trump” people feel about our president. While all-digital operation is not a panacea by any means, I would put the “never-digital” crowd in the same bucket with buggy whip manufacturers as internal combustion engine powered vehicles came on the scene. It doesn’t take a crystal ball to see that if there is not some kind of quantum improvement in the AM broadcast medium, its audiences will continue to decline in coming years and many stations will simply not be worth keeping on the air. A lot of AM stations are already there in reality, and many are held on the air by sister stations in the cluster or FM translators that duplicate much of their coverage.

So what about receivers? Are there enough out there to make it worthwhile for AM stations to make the all-digital switch? At this point, probably not. Xperi, the licensor of HD Radio technology, reports that there are currently more than 55 million HD Radio equipped cars in the United States, and that all major auto brands offer factory-installed HD Radio receivers, with HD Radio technology a standard feature in over 170 vehicle models.

My own experience in recent years is that about half the rent cars that I have driven have been HD Radio equipped. Those, of course, represent new vehicles, and there’s no question that people are hanging onto and driving vehicles longer than in years past – the car I drive is 13 years old (and is HD Radio equipped!) – but newer vehicles will continue to enter the consumer fleet, and with them will come HD Radio. As for home listeners, there are a number of tabletop and portable HD Radio receivers available, including the \$69 Sangean HDR-14 that I

have playing on my desk as I write this. Just go on Amazon.com and search for HD Radio and you’ll get a screen full of available receivers.

So is the time right for all-digital AM? I would offer a resounding yes! But it must be on a voluntary basis, with individual station licensees making the decision as to whether it is right for them. I think it could be right for AM stations whose programming is 100% duplicated by a sister station or translator, and it could also be right for AM stations that are being “warehoused” and on which there is no significant revenue being produced. I think it would be a mistake for non-duplicated AM stations with viable programming and revenue production to make the switch right now.

As I mentioned above, the FCC invites comments on a number of questions in the All-Digital AM NPRM, and it will be interesting to see what responses are submitted. We plan to submit comments in support, and we will answer as many of those questions as we can. I believe that the FCC will enact these new rules permitting all-digital AM transmissions on a voluntary basis, and by sometime next summer, we could see the first stations making the switch.

Will any of Crawford’s stations make the switch? I wouldn’t be a bit surprised if some do. Stay tuned...

### **Detroit**

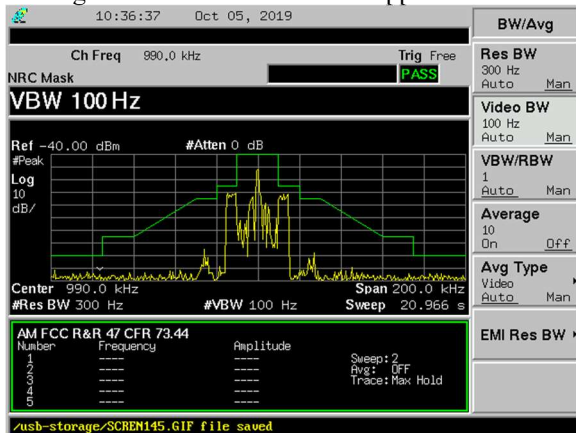
We are still looking for a chief engineer for our Detroit cluster. This is an excellent opportunity for someone with at least ten years major market experience and CBRE or higher certification. If you know of anyone who might be interested, they should send a resume along with three references to [techjobs@crawfordbroadcasting.com](mailto:techjobs@crawfordbroadcasting.com).

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

Hello to all from Western New York!  
Last month I had reported on a strange anomaly with our Nautel ND-5 at the WDCX(AM) transmitter site. The transmitter would run fine for days on end, then suddenly begin folding back with SWR faults. At the end of last month, after the second such incident, I suspected that the common point impedance had slightly changed, causing an impedance mismatch between the transmitter's output and the antenna network. Armed for bear, I made the trip back to Rochester with my oscilloscope, OIB and spectrum analyzer to finally put this issue to rest. I found the day/night common point impedances to be near dead-on 50 ohms, so that theory was out.



Next, I set up the spectrum analyzer to look at the digital spectrum and found that the upper and lower sidebands were grossly out. This was surprising to find as the DaySequerra modulation monitor was indicating HD lock and a strong robust HD signal. Once I made the adjustments in the IBOC exciter, all was happy again, that is until Friday after Thanksgiving. Earl Schillinger called to report that the transmitter had gone off the air. After unsuccessfully attempting to turn the transmitter back on via the Burk remote control, Earl jumped into his car to get a visual as to what had happened.



We have a storied history with this transmitter. Whenever there is a voltage imbalance or

drop in a phase, it will trip the main breaker. Thinking this was the issue, Earl was more than capable in turning the transmitter back on, saving me an hour and a half trip over there just to reset a breaker. Upon arriving, he did in fact find the transmitter's breaker tripped, so he reset the breaker and called me to report his findings.

While on the phone, the transmitter began folding back again with SWR trips, so I walked Earl through putting the transmitter in analog mode only. The whole trip over to Rochester, I was going over in my head what could possibly be causing this? I had already ruled out the antenna/phasor system and transmitter, so the only other contributor was the AM-IBOC exciter.

After arriving at the site and putting the transmitter back into HD mode and seeing the transmitter fold back with numerous SWR faults, I went back to analog and powered down the AM-IBOC and removed power from the unit. After about five minutes, I powered the AM-IBOC back up, put the transmitter back into HD mode, with no issues! I has been running now for several days with no problems. However, I am certain that the issue will pop up again. I spoke with Terry at Nautel support and he recommended that I send the AM-IBOC in for them to see if they can isolate the problem. This has truly been a learning experience! [See Amanda Hopp's column below for a similar AM-IBOC anomaly. -Ed.]

In other Rochester news, we are preparing for the installation of a new natural gas fueled generator that will power our entire studio location. We generally experience at minimum, 10 brown or black outs at the studios each year, and countless momentarily blips in our electrical service, each time causing us to lose air time. Commercial Power Systems of Farmington, NY has agreed to install a brand-new generator, capable of powering our entire operation at no monetary cost to us, completely trading out the cost with advertising on both WLJZ and WDCX(AM)!

Installation is set to begin the second week of December, and I have been busy insuring that all of our Nexgen equipment is sufficiently protected with a UPS back-up. I am told that it could take as long as 15 seconds for the genset to get to operating speed once a power loss is detected and the transfer switch sends the load over to the generator. We had a couple of locations that were not adequately protected, so we purchased a couple of additional APC UPS units to handle those vulnerable locations.

In Buffalo, things have substantially quieted down after last month's issues. I have been quite busy trying to get all of our sites winterized for the season, as I was sidetracked in the late fall taking care of other, more pressing issues. So far, this winter has been most kind, with only one snowstorm to date. As we enter into December, I am sure that old man winter will come calling with blustery winds and knee-deep snowfalls! Ah, 'tis life in the northeast!

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### News from the South

by

**Stephen Poole, CBRE, AMD**  
**Chief Engineer, CBC-Alabama**

Merry Christmas! I hope everyone is ready for it; this year has almost ended. As I write this, my wife Sandy is in NC with her family, but she'll be back in early December. Yay! I enjoyed a turkey lunch at the local Cracker Barrel restaurant along with a crowd of other people. Apparently, a lot of folks go to The Barrel for lunch instead of cooking.

What am I thankful for? Too many things to list here, seriously. Being saved by Christ, my wife, my job – like I said, too many things to list. I'm blessed and I'm happy, so it's too bad that this month's article will primarily be a whiny rant. (You have been warned.) First, a couple of odds and ends:

#### Pre-Filing Announcements

It's license renewal time for Alabama stations, and the FCC is serious about the required pre-filing announcements running when they should, and naturally, so are we ("we" includes Cris in Denver, who keeps a close eye on stuff like this ... and well he should). We made it through all of them just fine, thanks to good effort by Todd, Jack and the programming staff for our stations here in Birmingham. Some of our stations are almost entirely automated, so we (engineering) took it on ourselves to confirm that they aired properly.

Cris suggests that you run these in the AM time slot. That way, if anything goes wrong, you have a second chance to air them in afternoon drive. That ensures that you don't have to go to the FCC, hat in hand, sheepish look on face, saying, "uh ... one of the announcements aired a little late ..."

#### New Website

It's not my place to officially announce this (I'm anything *but* official, anyway), but we've spent some time in November setting up a new corporate Web site. I'm sure more will be announced later, including some possible changes to our email as well. Now for the whiny rant:



#### Dropouts

No, not the folks who never finish school, digital dropouts. This is one big bugaboo with the shift to digital audio delivery that hasn't been adequately addressed. If your data link degrades, the audio will start digi-blooming and dropping in and out. The problem is, even with silence sensors, you probably won't get an alarm. The audio is there, it just sounds horrible – like Max Headroom on psychoactive drugs. (I just revealed my age there; some of you have probably never heard of Max.)

I first experienced this with our old Harris Aurora link, installed back in 2006-2007 (as I recall). This was a microwave T1 equivalent that allowed us to use a Harris Intraplex to ferry lots of audio between our studios and the WDJC site on Red Mountain. The loss-of-signal (LOS) alarm on that thing was a joke: it was a simple relay that would toggle like mad whenever you had a fade. I had to add a capacitor and MOSFET to enforce a delay whenever it would start toggling. Inside the unit, though, you could still hear that relay chattering like a monkey. It's a miracle it didn't catch on fire.

Surprisingly, even the latest equipment still doesn't address this to my satisfaction. The Horizon NextGen units that we use for a few secondary

signals have alarm closures, but they're basically chatterboxes, too. Even more surprisingly, the Tieline Bridge-IT units don't have squat. Nada. You can get an option (same as with the Horizon) to use two different delivery paths for the IP, but as far as letting you know when the link is degrading, there's nothing there.

Time for another Raspberry Pi fixit: we may be able to check link quality via the Simple Network Management Protocol (SNMP). The manual doesn't have a great deal of information on this, but hey; Todd likes a challenge. It's still annoying that they don't have a relay closure or an open collector alarm output.

### The Case in Point: 850 AM

This really bit us a few days ago. A tower climber apparently bumped one of our dishes up at Red Mountain *just enough* to make the signal to the 850 site in Tarrant marginal. This is a uBiquity NanoBridge that we use to short-haul the data from the ground to the big Dragonwave up on WDJC's tower. Fortunately, the bumped end was on the ground, and Todd was able to eyeball it and get it back in line to restore the signal.

Meanwhile, Jack was at the studios checking Received Signal Levels (RSLs) on everything in the link, because WXJC, 850 AM, sounded horrible. Adding to the hilarity was the fact that the Omnia, which is set up to automatically switch to the backup on LOS, was perfectly happy with that glitchy, gnarly, popping audio. Hey, it saw a level, so it just chugged right along. Fortunately, I was on my way to the 850 site in Tarrant when we got the report, so I was able to force it to the backup pretty quickly.

The operative term is "force." While I'm complaining, I'll again mention that the user interface on that Omnia 9 is anything but intuitive. I got tired of searching for a way to change the inputs and solved that problem by physically disconnecting the Tieline. The Omnia timed out, then switched to WDJC's HD2, which is our emergency backup. A few minutes later, while troubleshooting, I accidentally plugged the AES cable back into the Tieline, at which point, the Omnia happily switched back to that signal. Back to sounding like junk. At first, we thought that WDJC's HD2 signal was glitching, too! We felt a moment of despair, but then I realized what had happened. I unplugged the AES cable from the Tieline until we positively had the link restored.

The final hilarity was the fact that the microwave link was working, but with inadequate throughput. Jack was able to go into the Omnia and

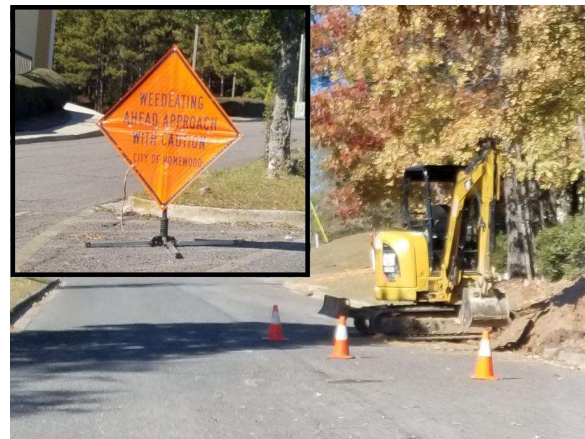
watch the meters glitch and sputter, because that remote control software doesn't use a great deal of bandwidth. But it was apparently just enough to cause dropouts on the high-bandwidth, high-quality audio. Anyway and eventually, after lots of head-scratching and running, Todd tweaked the ground "nanner" dish at Red Mountain, I waited long enough at Tarrant to be sure that the link was reliable, and Jack monitored the RSLs and helped at the studio end. I finally moved the Omnia's primary input back to the Tieline.

I'm not sure what the answer will be, but as I said, it'll probably involve something like a Raspberry Pi or even an old laptop PC. The key takeaway from this (consider this a certified "pull quote," with italicized emphasis) is as follows:

*It's possible for your data link to degrade just enough that your audio sounds terrible, but yet, you still have enough bandwidth to check the equipment or use the remote controls, so you don't suspect the link! (Re-read that a coupla times.)*

The thing is, the vendors who make this fancy "audio transport over IP" stuff include helpful troubleshooting hints, but all they say is, "if you're getting dropouts, confirm that you have a good link." Well. OK, thanks. (Stephen nods and tips his hat.) It'd be nice if you'd give me a simple closure to ground if your equipment is experiencing excessive dropouts, or continually emptying its buffers, or etc. Better yet, add smart logic – a timeout or some "hysteresis" to the closure – don't just let it chatter and clatter away.

Here's the key in a nutshell: I don't just need a relay that chatters and clacks on a marginal signal, I need something that will positively switch to a good backup, then wait for the marginal signal to markedly improve before switching back.



**In Alabama, we HATE weeds!**

### Odds and Ends

That's about it for this time. I'm allergic to not including a picture, so I'll add this. Has nothing to do with broadcasting, though I snapped this shot with my phone while driving up Summit Parkway to the studios. I got a really good chuckle out of that one. I posted this image on Facebook with the

comment, "Alabama: we absolutely, positively HATE weeds."

(Yes, the folks who were using the CAT-hoe had their hats on backerds. Yee hah!)

Until next time, have a blessed Christmas and New Year, and keep praying for this nation!!!

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

### Air Leaks

Over the last few months, we saw our dehydrator at the Lansing, Illinois, transmitter site begin to run more often. We had scheduled to replace the dehydrator this year. Before we did the replacement, we went through the all the plumbing for the air system that we could check without a tower crew.

A few fittings around the control valves needed attention. This seemed to slow down the amount that the dehydrator was running, but it was obvious that the dehydrator was near the end of its life span and was running simply because it could no longer make the pressure needed.

So, we went ahead and put the new one on line. It did run less for a little bit, but it wasn't very long before we noticed it running quite a bit and then eventually running all the time, and it was keeping the load. Once again, we checked everything on the ground that we could without actually climbing the tower. We couldn't find any leak that we could address ourselves.

Getting a tower crew to come quickly was a different matter; most were involved in TV repack and the subsequent 5G rollout for cellular companies.

We have two FM antennas on this tower and thus two transmission lines that are pressurized using the one dehydrator. Each line has a separate control valve and pressure gauge. This allowed us to shut down the dehydrator and close each valve. It was fairly obvious to us that the problem was on the auxiliary transmission line and antenna system as the main system's gauge hardly moved and the aux line went down very quickly.

While we waited for a tower crew to come, we experienced issues with the transmitter on that

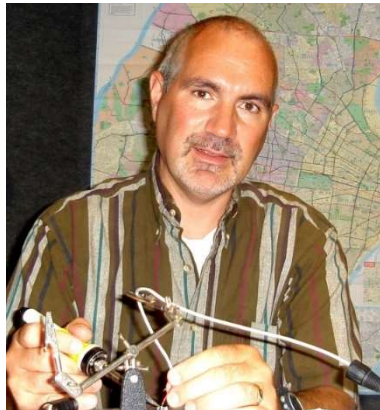
line. One day, we saw the reflected power go up and we couldn't maintain full power. The immediate conclusion was that we had water in the line causing issues with the VSWR on the line.

However, we decided to run the transmitter into the dummy load and saw that we had some of the same issues and symptoms that it displayed into the auxiliary antenna system.

We also noticed that the transmitter's reflected power reading into the dummy load was quite high and much higher than the reading on the external power meter. This meant the transmitter's reflected power calibration was just off. The conclusion on all of this was that

there were several bad power amplifiers in the transmitter.

The modules were sent for repair and when we got them back into the transmitter and on the air,



**A broken butterfly clip rubbed this hole in the line.**

we noted that reflected power on the auxiliary system was higher than expected, but not nearly as bad as we feared initially when we thought we might have to replace the transmission line.

Shortly after that, the tower crew was freed up and running by the site to another project. They did a climb and found three leaks on the auxiliary transmission line and repaired them. At least one of these was fairly large. The cause they found on all three of these leaks was that the butterfly clips used

to hold the line to the tower had broken and then in the wind vibrated back and forth until each of these clips opened a hole in the line. Their conclusion was that this specific brand of clips was the issue.

After the repairs were made, we hardly ever heard the dehydrator running. It still does, but most of the time it is just sitting at full pressure. We noted that the reflected power on the line was also down considerably.

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

A few months ago, I reported some difficulties with the Burk ARC Plus Touch system. On occasion, perhaps one out of 25 times or so, it would miss a pattern change. I had created a macro that would verify the pattern change and repeat the command if necessary. At that time, I was still trying to diagnose whether the problem was within the remote control system or if it was in the antenna controller.

With the macros and the alarms that I had implemented, it was after a few weeks of monitoring that I finally caught the problem. The Burk remote control system had indeed failed to provide a relay closure for a pattern change. With that information in hand, I contacted Burk to get their assistance.

As it turns out, this problem was not completely unknown to Burk. It seems that the command would be sent once with no feedback as to whether the relay actually really closed. Fortunately, the manufacturer had a solution. They had developed a firmware update that included a hand-shaking protocol so that if the relay did not close, the command would be repeated over and over again, for up to five seconds, until it did close.

I updated the firmware in our Burk units, and so far, after about eight weeks, we have not

failed to make a pattern change. Time will tell, but it looks like the problem has been solved.

In other local news, it has been a very

strange time here in California, with the utility company shutting off power to the homes and businesses that are in wildfire-prone areas every time the wind blows. As a recall, I reported last year in one issue of The Local Oscillator that it seemed like the entire state was on fire. Much of the blame for those fires was put on the utility company,

PG&E. The high winds cause trees or branches to fall on the power lines, shorting them out and creating sparks that light the brush on fire. Fortunately, KCBC is not in a wildfire-prone area and we have not had our power turned off.

Many residents assumed that their solar systems would provide power for them during these blackouts. Evidently, it was never explained well enough to them that their grid-tied systems only worked when the utility power is on. Now there is a rush to add off-grid capability to some of the solar power systems, and that is more than a minor modification in most cases.

It seems like a crazy time we live in. We put men on the moon in 1969, but we can't even keep the power on in 2019... or get a plastic straw in a restaurant.



**The Portland Report**  
by  
**John White, CBRE**  
Chief Engineer, CBC–Portland

Did I mention that I hate computers?

Actually, most problems are caused by the choices programmers and system designers make.

The PC architecture can be found imbedded in unexpected places. For example, several Rohde & Schwarz test instruments are based on an imbedded Win XP platform... a platform that ages, forcing the instrument into obsolesce.

In a later trend, many current test instruments depend on the PC platform to create a front panel and display processing for USB-connected test hardware. A major update of EAS hardware illustrates the point in several ways.

IPAWS distribution to individual EAS boxes depends on internet connectivity. Security and connectivity become a moving target, depending on multiple moving parts in which failure or delay of any part can take down the system.

We learned that with a short period of days to upgrade. Fortunately, Crawford Broadcasting ordered the upgrade early. Unfortunately, a lost or mistyped serial number is a monkey wrench in the gears of the upgrade. Fortunately, the FCC extended the deadline. Sort of.

I wish the story would end there, but alas, it did not. The other shoe dropped, and due to the interface change, the older workhorse XP computers will no longer talk to the ENDEC.

Linux anyone?

In Oregon, Raptor is a graphical interface system that provides Emergency Management with logistic information during a disaster. Those of us in

the Northwest think of the subduction zone earthquake as the large disaster. I once saw a movie called *Earthquake*. In theaters, the movie simulated the trembler using low frequency sound to shake the audience. The movie shaking was 30 to 45 seconds at the longest. A 9 earthquake would produce shaking for 10 minutes.

But emergency management isn't limited to *the* earthquake. This last spring, Eugene received a foot of snow on the valley floor, worse on the surrounding peaks. Finding critical resources, broadcasting, and public safety information became a priority. One of the lessons learned is we need to do better with the local broadcast information component of the Raptor system.

As I have been looking through the broadcast data, I have been struck by the poor accuracy of location information in the FCC license database, particularly for the AM segment, presumably as its roots extend back to the early 1920s.

A few years back, I did a survey of land mobile license data for another project. I am not sure that data was any better with errors of a half mile or more. That old saw applies, GIGI. Garbage in equals garbage out.





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

Happy Thanksgiving everyone! I pray you all had a wonderful time with friends and family. I had an early morning, getting up at 4:30AM to get our smoker going so the pork shoulder could cook. We purchased the smoker early this year after find some good deals. We have truly enjoyed trying out different meats. So far, pulled pork is my favorite. I still have a lot to learn, but I am enjoying every bit of it.

November in Denver has been rather slow to be honest. I didn't need to make many trips to the sites. On the first, my dad had his reconstructive surgery on his leg. While he was in the hospital, I was my mom's ride to and from each day. Something I don't mind at all, but still a huge inconvenience as the hospital is located near Denver, miles from the freeways, so once you get off the freeway, it's stop light city. I was very grateful when they released him the following Wednesday. Now some of my days consist of me stopping by his house to help out with things as well as bring him paperwork from the office so he can stay on top of things. I bet if most of you didn't know he had surgery and only spoke to him about work stuff, you wouldn't have had any idea there was even anything wrong.

#### **KLVZ Issues**

One of my board ops came to me one day asking me about the HD signal on 810 KLVZ. He had said he checked our other three AMs and was able to get HD but not on 810. I looked into things and sure enough, the HD wasn't working. Somehow, we were still on air. Typically, when the HD goes out, it's the AM IBOC exciter that has cratered. Last time this happened, I had to rework the transmitter for analog since it's either/or, not both. I am grateful that the good Lord kept it on air for us. I went to the site and didn't see anything obvious, but I decided to go ahead and reboot the AM IBOC exciter for good measure. I switched to the night site while I rebooted the equipment so as not to take the station off air.

Once it came back on, we had HD again and all I was good.

Before this trip, I had noticed another issue at the beginning of the month. Each month, I log into all of our internet-capable modulation monitors and clear the error logs. I went to log into the 94.3-FM (KLVZ) monitor and found an error. I got on the phone with Inovonics, who looked into it. The gentleman I spoke with ended up updating the web page and that worked. You see, there are two updates to these units, one for web page and the other

for firmware. He told me I should do the firmware so when I went to the site to deal with the HD issue, I dealt with that as well. The weird thing was the monitor had no levels showing. It was on, but nothing. I could log in and see everything. Something clearly happened at this site, and despite being on a UPS, these two things were affected. I was able to reboot the unit into the update mode so I could install the firmware. No issues since.

#### **Ode to the Beacons**

It has been a month of beacon issues. I began receiving an alarm for KLTT that tower 3 had a light out. Keith went out for me and found the top beacon completely out. I called in a NOTAM and called Derek Jackson to get him scheduled for a climb. We typically don't replace all four bulbs on these towers, just the level of beacon that is out, so when Derek climbed, he only replaced the top beacon bulbs. We checked and all was fine.

Then that night, I got another alarm that tower 3 had a light out. I went to the site and could clearly see one bulb was out on the lower beacon. I called Derek again and he came out and replaced that level of bulbs. Then that night, another alarm, but for tower 2! This time, I decided to just have Derek replace all four bulbs on the tower. I didn't even go check the lights. I called in the NOTAM and got things scheduled with Derek. It has been a year or two since any of these bulbs were replaced, and chances are, they were replaced around the same



time, which is why they all went out around the same time.

### **Burk!!**

I had been getting alarms every night that the KLVZ night tower 3 ratio was off. I would check, and sure enough, it was way off. So far off I could tell it was a lie. All the other parameters were right where they belonged, but that one was not. Typically, if there really were an issue, you would see it elsewhere as well, something I did not see.

After several trips to the site to recalibrate the Burk ARC Plus, I decided to do some real work. This began at the antenna monitor, where I sprayed Deoxit into the phoenix connector on the back and worked it to be sure the connections were clean. I did this for all four towers. I also checked the wires going into the connector and made sure each screw was tight. Then I moved to the IP8 of the Burk where I made sure the screws holding those connectors were tight and making good connection. Then onto the block where I made sure each punch was solid. I then had to recalibrate everything because it all went out of whack.

It all seemed to hold, so I thought I was done. That evening, though, another alarm. The parameter was a 9.99, which I know wasn't right. I recalibrated again and it has been holding solid ever since.

We are having more and more issues like this at each site where the ARC Plus seems to lose its calibration. I am not sure where the issue is, but I do the same things at each site and it seems to correct the issue for a time.

### **Wheatstone Console**

While doing a NexGen update one morning, I was in the KLDC control studio. While doing the update, I decided what better time to replace two computers. While I was doing work in the studio, I kept hearing a weird noise. I had my airpods in and was listening to a podcast, but I could still hear this noise. I quickly found it was coming from the G6 console. It was the processor fan. I got in touch with Wheatstone and was able to get one ordered up quickly. I went to install it a few days later, and when I powered the console back up, nothing. It came on, but didn't boot up into a usable state.

After troubleshooting with Wheatstone, we decided I should send the motherboard in for repair. This is when the project started. That studio has several live shows on the weekends, and they needed a working room, especially since it was a Friday and didn't allow time to reschedule with the clients.

Jorge, the operations manager, suggested we switch the console with the one in the KLVZ studio. That studio is used rarely and only for recordings. So that is exactly what we did. He helped me, which I greatly appreciated, being the muscle and carrying the consoles to each room (we swapped them). Of course, when the console came up it still had all KLVZ stuff on it (it "thought" it was KLVZ), so I called Wheatstone back. Jeffrey Vance was the guy helping me, and he was great. He was able to FTP into each console and essentially changed the programming for each one through FileZilla. After a reboot of the console, it was ready to go as KLDC.

I had asked them if they could put a rush on the motherboard. I overnighted it on a Friday for Monday delivery and they were amazing and were able to assemble a new one and get it to me the Wednesday before Thanksgiving. Jeffrey had even already put the correct programming in the system so when this console booted up, it would be the right sources (KLVZ). I did get the console put back together and got it up and running, which was a relief as I knew I'd be out through the Thanksgiving weekend and wanted to have the room up and running in case anyone else needed it after Thanksgiving.

The question is, did I damage the processor when I replaced the fan? That is entirely possible. The old fan was really stuck on there, and I had to use force to get it off. But the other thing is it could easily be that since the processor was already having issues that this one last power cycle was truly its last. Either way, it was costly as those motherboards run \$1,000+.

I ordered fans for the other three G6 consoles. I figured they were installed at the same time, so it's only a matter of time until the rest go out. After this, though, I am not sure. I am worried to try it. I will most likely do one at the beginning of the week so that if things do go wrong, I am not feeling rushed to get it done. Hopefully, though, it is a one and done deal. The new motherboards Wheatstone uses for these consoles actually do not have a fan, which is great. I almost wish I could just get three new motherboards and call it good.

### **Intercom System**

Security has become something we want to deal with at the Denver office. It's not that anything has happened, but we typically lock the suite down at 5:00 PM. Yet the receptionist leaves around 3-3:30 most days, and that allows anyone to just walk in. So we are in the process of getting a new video intercom system put in. This will allow the receptionist to talk

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to people and buzz them in. We will also have a station in our copy room outside three important offices where they can go out and see who is at the door and let them in if no receptionist is present. I am not sure yet if we are going to lock things down 24/7 or just change the time we do lock things down. I do look forward to using this new system.

**Upcoming**

I cannot believe Christmas is just around the corner, and then 2020. This year has flown by. I feel

like I haven't gotten to complete nearly as much work done around each site as I would've liked, but I do know that things have been continually running fairly smoothly, which is really all I could ask for. I can only hope that as 2020 approaches, I can prioritize what needs to be done and between Keith and me, and with a little help from my wonderful husband from time to time, get it done. I pray you all have a very Merry CHRISTmas, and until next time... that's all folks!!!

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**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/95.3 MHz, 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, 2.2 kW-D/430 W-N, DA-2*

**WDCX • Rochester, NY**  
*970 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**  
*970 kHz, 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, 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*

**WXJC-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*

**WYDE-FM • Cordova-Birmingham, AL**  
*92.5 MHz, 2.2 kW/167m AAT*



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