The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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All-Digital AM

Back in March, Ben Downs of Bryan Broadcasting in Texas filed a petition for rulemaking with the FCC to permit all-digital AM on a voluntary basis. Crawford filed comments in support of this proposal. Recently, the FCC announced that this would be on the docket for the November meeting, meaning that the idea has some traction. Remarksb from Chairman Pai would seem to indicate that it has his support, and itôs likely that it has the support of others as well.

I have followed in the trade press the back and forth on this proposal, and that has been interesting.

Downs raises some very good points in his proposal, the foremost of which is that it fixes the noise problem. Downs states the obvious, that the AM listening environment is hostile and plagued with noise which, at this late date, is here to stay. There is simply no way to put the genie back in the bottle ï all those noise generators are here, and theyôre here to stay. In his proposal, Downs states that full-digital operation is the only option that fully addresses the problem. The noise doesnôt go away, but it is ignored by the receiver.

Another point in favor includes elimination of the IBOC ñhashò generated by the AM HD Radio hybrid mode. While there are only about 250 AM stations reportedly operating in the hybrid mode, there is no doubt that those stations do transmit permissible emissions on adjacent channels, and this has long been a complaint of digital radio naysayers. While I donôt deny that this problem does exist, I maintain that it is spectrum real estate that stations are entitled to. That notwithstanding, Crawford has taken extraordinary measures to be a good spectrum neighbor and reduced or even suppressed entirely some digital carriers to prevent interference.

And yet another point in favor is that in many cases, all-digital AM represents the lowest cost option for reducing or eliminating noise and extending a stationôs listenable footprint. The narrower bandwidth of the MA3 all-digital mode will work with the existing antenna bandwidth of many existing stations, unlike the hybrid mode that places some significant demands on antenna system bandwidth. Compare this to a big power increase, if such were permissible, to increase the signal-to-noise ratio, which might well entail a more complex directional antenna system, more real estate and certainly bigger utility bills to generate all those noise-overcoming kilowatts.

On the other side of the argument is the elephant in the room ï that analog listeners that do not have HD receivers will no longer be able to receive all-digital AM stations. ñDisenfranchisedò is the word that the naysayers like to use, and it fits. I saw some listener comments recently that make this very claim, and I canôt argue with it.

Buté I continue to believe that all-digital AM represents a viable option for *some* AM stations. High on the list are AM stations whose programming is 100% duplicated elsewhere, either on a sister station or a translator with good market coverage. Think about it ï if an AM in a small market or town has a good translator that serves the whole community well and most (if not all) the listeners are listening to that translator instead of the AM itself, why not go all digital on the AM?

Of course some would argue that the status quo would be better ï just leave the analog AM on as the placeholder for the associated FM translator and save the money, and that may be the best course of action for some stations. But for others, especially for those with fairly late-model transmitters that can easily be converted to all-digital, it could be worth making the investment and extending the high-

fidelity, stereo, digital signal with metadata to a much larger area than is served by the translator, and that is an investment in the future of the AM band and medium.

The point here is that if the FCC allows it, the choice of whether or not to convert to all-digital AM will be an individual one, completely voluntary, and while perhaps an analog ñsunsetò would be appropriate at some point way out there in the future, weôre a long way from that at this point.

Right now, we await the FCCôs decision and hope that we are given the option. With that action likely, you can bet that weôre already thinking about it and which of our AM stations would be good candidates for all-digital AM. Making that change on one or more is something I look forward to.

Pulling Together

You have read in these pages in recent months that we are without a chief engineer in our Detroit operation, which is one of the busiest in the company. We have a couple of candidates that we are talking to and are hopefully heading toward a permanent staffing solution there.

In the meantime, however, a few people have really risen to the occasion to help us get through the crisis, and those people are deserving of some public accolades.

Steve Cuchetti has, for the past year, been an up-and-coming engineering trainee in our Detroit market. Our prior chief engineer identified Steve, who was then a board operator, as having some skills into which we could tap, and we subsequently split Steveôs duties to let him develop and expand those skills. Since September, Steve has really stepped up, showing that he can follow directions, communicate clearly and take appropriate steps when things run off the rails.

As I considered what all Steve has done in recent weeks to keep things on track, I realized that the list was pretty long, but a few items are worth mentioning. We had a power failure at the WMUZ(AM) site that the utility provider corrected, but we found that we had some downstream damage as a result. Steve was able to work with electricians and generator repair techs to get all those things corrected and get our station back on utility power. He also worked with electricians to get 20A 120-volt circuits/outlets installed for our new 2.2 kVA UPS units at two of our sites. And he was able to do a reset of the tower-mounted electronics at the studio to restore the microwave link to the WMUZ(AM) site.

Rick Sewell is another individual who has been invaluable in helping us over the ñDetroit humpò in recent months. Rick made a trip to Detroit and took care of a number of urgent issues. More on Rick later.

Amanda Hopp has been invaluable in helping us keep Detroit running during this interim period. Time and again I have turned to Amanda to help me sort out something in that market. She got TeamViewer purchased, installed and configured so that we have remote access to much of the internal infrastructure of our Detroit operation, and she preconfigured and shipped a new Wheatnet computer, a new router and managed switch.

We have some good friends in Detroit, and among them is Russ Harbaugh, a registered professional engineer that has always been ready and willing to help in the past. He jumped in on three separate occasions recently to do the annual occupied bandwidth measurements on all three AMs, measure the base impedance and touch up the ND network on WCHB tower #1, and give the ten-tower nighttime array a tweak to get all the parameters back on the money.

Next, Brian Bonds, a rising rock star in our company. Brian has made several trips to Detroit to deal with various issues, including getting a failed Trango microwave link back up and running, fixing PA problems with the FM transmitter, remapping the IP addresses of the studio and four transmitter facilities, replacing some computers, routers and switches, and countless other things. He made a special trip in late October to do some reconfiguration to accommodate a new on-air account.

I said I would have more on Rick Sewell, and I do. I see Rickôs hand at work in what Brian has been able to accomplish for us in Detroit during this transitional time. Rick has invested a lot of time and effort in Brian in recent years, teaching him through the gap between a first-rate Purdue University BSEE education and the real world of broadcast engineering. As such, it was with complete confidence that I sent Brian to Detroit over the past months, knowing that he had not only all that to draw on but also that he had Rick on speed dial if he had a question.

Soé great job Steve, Rick, Amanda, Russ, Brian and all the others who have had their hand in keeping the trains running on time in Detroit in recent months. Until we get someone in there full-time, we get by with a little help from our friends.

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

Hello to all from Western New York!

Problems, problems and more problems! That pretty much sums up the month of October in our Western New York stations. This past month, we have seen an unusual number of issues crop up, which has kept me quite busy, jumping from one fire to another, trying to keep everything going. In a month when I should be preparing our sites for the long winter months, most of my time has been spent evaluating, diagnosing and making repairs on various pieces of broadcast equipment.

The month started out with a call from the Rochester board operator stating that he was not receiving any DRR recordings from our C-Band satellite receiver. He did note that programming was being received from the internet-based Ambos, so that narrowed down the problem to either the Unity 4000 receiver, or a dish issue. On Thursday the 3rd, I made the trek over to Rochester to see what was causing the problem.

The first thing I checked was to see if the LNB was receiving voltage at the focal point. Finding no voltage present on the RG-6, I then checked the output of the receiver to find that all was OK there, so I knew the problem was in the coax. Starting at the exit point from the building, I traced out the coax looking for any obvious damage and found the problem just under the dish where a splice is located.

Cutting away the weatherproofing covering the splice revealed that water had entered the ñFò barrel and corroded the connections. This would be an easy fix, new barrel, F-connectors and new weatherproofing got us back up and running.

A few days later, we experienced some electrical power issues at the WDCX-FM transmitter site caused by high winds. Seems we were having one phase dropping in and out, which caused a failure in one of the modules in our surge protector and also damaged a composite DA and RBDS confidence monitor. Fortunately, the damage to the equipment wasn't catastrophic, and I had the parts on hand to get the equipment back to working order, with the exception of the surge suppressor. I will have to order a replacement module for the 120-volt leg.

On Thursday the 17th, Earl Schillinger called from WDCX(AM) to report that the AM transmitter was acting peculiar, and the telemetry readings were bouncing up and down. Once I arrived at the site, I found that the transmitter had cut back on SWR faults. Clearing the fault, it was just moments until the problem started again. Not sure whether this was a transmitter or antenna issue, I switched the transmitter into the dummy load and the SWR faults ceased, which indicated that the issue was somewhere in the antenna. I brought the transmitter back up and made the trip out to each daytime tower to see if I could locate the cause.

At tower #4, I found the problem: the arc gap! We recently had some major work done on all six of our tuning houses, so I can only assume that the contractor bumped the bottom arm of the arc gap, causing arcing during modulation peaks. An adjustment of about 1/8ò was enough to stop the arcing, resulting in one happy Nautel transmitter!

About mid-month, we began experiencing internet issues at our Rochester facilities. Mark Shuttleworth called in Spectrum, the ISP, to try and rectify the problems. Unfortunately, either this guy was a complete idiot or he just didn't have a clue as to what he was doing. He added a switch between our internet router and our internal NAT, which is the firewall between the internet and our equipment. He then proceeded to start removing random network cables from a 16-port switch which was serviced from a separate internet service.

Now, I'll be the first to admit that our wiring scheme for internet networking leaves a lot to be desired. When that building was first wired for internet, all of our services terminated downstairs where our offices were located. I don't recall which

company came in and installed all of the network cabling – they did a good job in that aspect, but failed in labeling and mapping out the system. Fast forward ten years. The offices were moved upstairs but the internet services remained untouched in the downstairs location and were added to again and again over the years, resulting in a spider-web of network cabling, making identification of individual cables impossible.

I was able to get all of the issues resolved after spending hours upon hours troubleshooting, and resolved that in the future, any network cable installed from that point on would be labeled source/destination on each end.

Everything was running smoothly with the internet services until Tuesday the 22nd, when our streaming began to breakup on both stations. Spectrum made a service call the next day, and I was on hand to oversee everything he did. He determined that the internet modem was the cause of the outages, along with the switch the previous repairman installed. Replacing the modem and removing the switch got everything back up and running. I stayed on site for several hours later to ensure that the problems were indeed gone. I had just returned to Buffalo when I got the call that the internet was breaking up again, this time worse than before.

The next day, Spectrum spent several hours trying to diagnose the problem, any finally noted that their services were working properly and the issue was in our equipment. I returned to Rochester on Friday the 25th with a new Linksys NAT to replace the existing router, which had been in service for several years. Once I got the new NAT programmed with the internet addresses and port forwarding information installed, the services have been running flawlessly. I have vowed to somehow get the network wiring up to standards and each and every cable identified and the entire system mapped out, as time permits.

As if the above issues weren't enough, when I arrived at WDCX-FM on Tuesday morning, I found that the entire phone system was down and a crucial computer in the WDCX-FM air studio had failed along with the portal computer attached to our VOIP phone terminal. Addressing the phone outage, I phoned Windstream, our fiber provider, and reported the outage. It was determined that the fiber-optic cable was the culprit and they would dispatch a technician within the hour.

While waiting for the technician to arrive, I pulled the failed computer out of the control room to diagnose the failure. From the condition codes displayed on the front of the chassis, I found that the power supply had failed. Looking around the station at some of the carcasses I have saved, I could not find a suitable supply that would work. I contacted our sales rep at Tiger Direct only to find that the supply for this 3-year old computer was already obsolete! He was able to find that they had 11 re-furbished supplies on hand so I had them send me two of them, as we have a couple of other computers in the station that are the same model.

I don't understand why Dell doesn't support their products for any length of time anymore. I guess they would rather sell a new computer than keep one up and running with replacement parts! The portal computer for our VOIP terminal ended up just being frozen, so a reboot got it back to normal. Meanwhile, the Verizon technician showed up and found a bad fiber-optic cable entering the terminal on the second floor of our building. He was able to replace the bad optic cable, and got our VOIP service back up by mid-afternoon.

Just when I thought I would get through the month without any other instances, I received a call from Earl Schillinger at WDCX(AM) that the transmitter was again having power output issues, similar to the problem he reported several weeks prior. Once I got to the site and began troubleshooting the problem. I realized it was not related to the earlier ball-gap issue. The transmitter was folding back on mod peaks, so the first thing I checked was to ensure that the RF current detector on the controller board was not the issue. Checking to see that the sample voltage supplied to the comparator (high RF current) was correct, I found the voltage to be well within range of factory specs. At 10% above rated power (5500 watts) with no modulation, the sample voltage should read 1.67 vdc. I measured the sample voltage to be 1.60 vdc at 5000 watts w/no modulation, and according to Nautel, it is well within the acceptable range.

I have dropped the transmitter's output power from 5400 watts to 5000 watts to keep the SWR faults at bay until I can return to the transmitter site with the proper equipment to further my investigation. At this point, I highly suspect a change in the network impedance. Solid state transmitters do not like to see much over/under 50 ohms impedance, and I suspect that over time the common point has drifted slightly, causing the impedance mismatch. I'll bring my OIB out next trip to figure this out.

findings on this interesting problem.

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

I remember the first time I drove a car with power disc brakes, because it was also the first time that I tasted a windshield (it was awful). When I scrambled off the dash and back into my seat, I told myself: ñSelf, be careful with these brakes.ò

This was back when Detroit was still building certified Land YachtsÊ ï in this case a huge, indecently-comfortable Chevrolet Impala that belonged to a friend. Power disc brakes were kind of new in those days, and they took some getting used to. It didnôt help that the brakes on this particular car were a toggle switch: it was either lock the wheels and screech to a halt amongst a cloud of blue smoke, or, ñOh no, Iôm gonna hit that thing!ò

All new technology has growing pains and glitches; there are too many examples to list in any detail. You know it, I know it, we all know it. But youôd think after decades of work on WindowsÊ , Microsoft would finally figure out how to do updates that donôt bust things. As I type this, the word is out that the latest update probably shouldnôt be installed. Maybe. Itôs up to you. All you risk is turning your computer into a doorstop; what have you got to lose?

Look, Iôm not a Microsoft hater. There are certainly bugs in any software, including some whoppers from other companies that have made the news. (As I write this, thereôs supposedly another vulnerability making the rounds of Android devices.) But honestly, maybe they do need to retire the Windows kernel. I mentioned last time that they were thinking about building Windows 11 or 12 on Linux. I would certainly welcome that.

You might ask, ñDoesnôt Linux have bugs, too?ò Sure. But Linux comes from an entirely different culture. Linus Torvalds, the creator of Linux, doesnôt build to a commercial schedule. Thereôs no pressure to get a release out by Christmas (or whatever). New versions are released when Linus says so, and not before. Each line of code is inspected by programmers from around the world, and vulnerabilities are quickly smished and smashed.

Is Linux perfect? Of course not. But having used both Windows and Linux for many years, I have to side with the latter. If youôre not convinced, this should do it: most updates to Linux software can be done silently, in the background, *and don't require that you reboot*. You donôt have to wait forever on some weird-looking screen that says, ñInstalling updates, donôt switch off.ò

The only time you have to reboot Linux is if the kernel (the operating system) itself is updated. Most distributions will download and install in the background, then tell you to reboot normally when you get a minute. The system comes right back up, ready to work. Nice.

New AC Units For 1260

We had budgeted for these, but back during the serious stormy time over the summer, it got put on the back burner. The 1260 site hasnôt given us much trouble with AC units, but theyôre almost 20 years old, and many parts are unavailable now. We decided to go ahead and be proactive on this one.

We wanted to gitterdone within the 2019 fiscal year, but there was one small problem: we had specified two (2) 2.5-ton units, the same size as the originals. The only units available without a months-long delay were separate 2- and 3-ton boxes. We decided to go with that, which explains why one unit is a bit larger than the other.

Iôve included a couple of photos (Figures 1 and 2) just because the installer, K&S Services, has specialized lift tools to move the units into place. Blake, the owner of K&S, has even offered to loan a fancy hydraulic lift to us if we need to move a transmitter. Slick, slick, slick!

Tower Lights

Most of October gave us some decent weather, so we did some tower light work at both 92.5 (WYDE-FM) and 101.1 (WXJC-FM). Lightning managed to slaughter the flasher puck and surge

Figure 1 - Lifting the 3 ton unit into place at 1260.

Figure 2 - Three-ton on the left, 2-ton on the right.

suppressor at 92.5; I had to fix that myself. First, we had to clear the brush that had grown up around the tower base during all the heavy rain. (The weeds here in Alabama are almost satanic in their ability to grow like é well, weeds é whenever they get plenty of water.) Jack helped with that, then liberally applied herbicide to help prevent a repeat.

At 101.1, the tower crew managed to get all of the primary levels (excluding the AOL at the very top) to communicate, but there are still a few stations out. If weôre going to keep that system, itôs time for a relamp.

However, Iôm beginning to suspect that the problem with the AOL is that there isnôt enough signal between the in-building controller and the AOL, over 1,300 feet in the air. We had lost the original controller a few years ago, and the replacement that TWR Lighting sent wasnôt the same. TWR said that it should work, but weôve had a lot of trouble with the top tier and the AOLs dropping in and out of sync. Better yet, the actual manufacturer (Orga) no longer supplies the original controller. Weôre stuck with the replacement. Yay.

Speaking of technology, I used the original Netscape Navigator as my Web browser until it morphed into the Mozilla project; I now use Firefox, same as Todd. It has its crochets and aggravations, but all in all, Iôve preferred it to everything else Iôve tried (including the new Edge browser, which Windows 10 really, *really* wants me to use).

Until next time, keep praying for this nation, and Iôm praying for Cris to recover from his surgery ASAP and smoothly. (I offered to go out to Denver with my Jeep full of tools to assist the surgeon, but said offer was declined.) Now letôs turn it over to Todd, who (as I write this) is at 92.5 in Pumpkin Center with the chainsaw, removing some fallen trees from the access road!

A Host of New Firefox Features
Todd Dixon, CBRE

For about as long as I have been at Crawford Broadcasting, Iôve been a Firefox web browser user. I guess Iôm a creature of habit and it just happened to be here before Googleôs Chrome browser existed. I remember when I finally told Stephen that I was going to send out an edict that everyone in our Birmingham market had to use Firefox. I was chasing down viruses about once every week and a half when people were using Internet Explorer (itôs also why I call it Internet Exploder).

All that to say that most web browsers have

come a long way, but I still use Firefox. I prefer its commitment to the open source software development community, and lately they have added a load of new features that would be extremely helpful to most of us.

The first new feature is that creating a Firefox account allows me to sync all of my browsing history, tabs, saved passwords and any other web related activity. (Look under **Preferences, Log In To Sync;** youôll need to create an account.) What that means is that whatever machine I get on that has the Firefox browser, I can log in and be looking at the same information across all platforms. This is probably most helpful to me on my phone, where having data that I had browsed at a tower site would be extremely helpful ؔ including logins to manufacturer support websites.

Another feature that they have added is Firefox monitor (**https://monitor.firefox.com**). Have you ever wondered how many times the data breaches we hear about weekly might affect you? My Crawford Broadcasting email account has shown up in seven breaches. Before you gasp too loudly, it is entirely possible that yours has as well and you might not even know it. The monitor feature not only tells you that data has been breached on a companyôs site, but it tells you what kind of data as well. Maybe it was just your name and phone number, but it could likely have been your email address and password.

Firefox has also added the ability to quickly grab screenshots as well. When you click on the ñ...ò at the end of the address bar, the last option is to take a screenshot. You can download the whole page, the visible part of the page or simply click and drag until you have what you need from the page. I use this feature all of the time for articles, writing how-to stuff for our employees or for when I have to send an email with a certain aspect of a page showing.

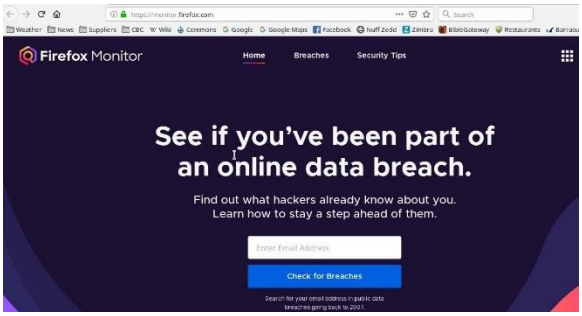


Figure 3 - See if your info has been hacked, courtesy of Mozilla/Firefox!

One other feature that ties into all of these is their Firefox pocket feature which allows you to save articles for future reading or to put a collection of informational pieces together for offline reading. I know a number of you will think that this has been available for a long time, but Firefox has made it extremely easy to use.

The very last feature that Firefox has added to their arsenal is Firefox send (**https://send.firefox.com**). All of you know that we often have documents, collections of pictures or videos and other assorted data that needs to be sent, but it is way bigger than our email attachment capacity.

You also may not be a part of a file sharing type site. What if it is too important to put on Dropbox, Google Drive or other sites? Firefox send allows you to share up to 2.5 Gb of data encrypted over the internet to another user. The link that is sent expires after a certain period of time giving the other user ample time to get that data, but it doesnôt remain on the internet for others to find and possibly use.

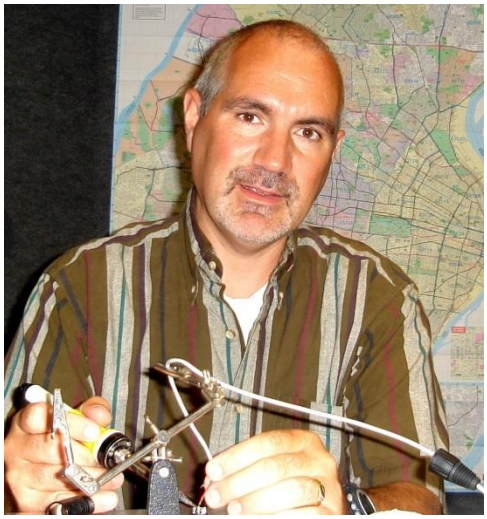
Iôm not trying to get anybody to change their browser (Stephen comments: I certainly am! Use Firefox!), but maybe your browser has similar features that you were unaware of. The syncing and sharing features alone for Firefox help to make it my web browser of choice.

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

Servers, Ransomware and Other Stuff

It was a busy month for the engineering staff in Chicago. We had a planned server swap and one that wasnôt planned, all while working around vacations, conferences and lending help to the CBC Detroit operations.

First off, we did plan on swapping our NexGen automation file servers. They had been scheduled for a swap out this year since they were now in service for nearly a decade. For the most part, they have been problem free for their time in service, so you have to hand it to Dell on this one, they were well built.



The swap went smoothly as we only had about an hour on Emergency Control Room (ñECRò) mode with all four stations. Once that hurdle was clear, we havenôt had a blip of an audio playout issue. In fact, with new servers in place, it seems that the overall NexGen network is a little less sluggish.

One problem that did crop up since the server swap was that our staff is having to use the NexGen feature in the software to reset ñWindow Positions.ò This is used to cure a problem of when a popup menu doesnôt show up on any of the screens. It usually happens when someone using their NexGen login goes from a two-screen workstation to a one-screen workstation. Sometimes the login ñremembersò placing a certain popup menu on the second screen, even though there is no second screen. NexGen has a simple fix for this, with either a keystroke or on a pulldown menu selection.

The problem we have seen recently after the file server swap is that this is happening on two-screen workstations and in particular control rooms, where this can be hazardous to a live program. I am not sure that is related to the file server swap. It might just be a coincidence. However, it has happened quite a bit the few weeks after the swap. We have asked for NexGen support department to help us find out what is going on, but at the time of this writing, no answers have been found.

The other server swap that is in process even as I write, is with our Domain, Active Directory and Visual Traffic server. This server is part of our VPN that connects with our downtown sales office. It has a partner server there for the sales staff. The server also houses our Visual Traffic software working with the traffic workstations.

At the end of last month, we started experiencing problems with some of the computers on the network having their files suddenly encrypted. Some of these files have yet to be recovered and probably will never be recovered. Fortunately, some of the files had a backup version so it wasnôt a total loss.

When our IT director sent me an email letting me know what was happening with some of the computers on our traffic/sales network, I immediately thought of the NexGen workstation that traffic uses for ingesting the traffic logs. It has a second NIC that resides on the traffic network. I was at a transmitter site at the time, so I called our IT director straightaway and asked to him drop whatever he was doing and go and pull the Ethernet cable on the second NIC of that workstation. The last thing we needed was the ransomware to spread to our automation network. That could have brought four stations to a grinding halt.

Unfortunately, a few computers with ransomware was not the worst part of this attack. The server hosting the Visual Traffic database was also affected. In the process of the virus software

removing the viruses on that machine, it caused the SQL software and database to be corrupted. This caused all the traffic workstations to be disconnected from the database. They couldnôt get their work finished. It was late afternoon and they still had not entered logs for the next day.

My staff responded admirably. Fortunately, the domain and active directory portion of the server was still functioning. We tried recovering the SQL software and database with no luck. At that point we grabbed a Windows 10 workstation and made it into a temporary Visual Traffic server. We had to use a backup of the database from the early morning backup sequence. This meant all of the work accomplished that morning was gone. Thankfully, the personnel in our traffic department were the kind of people that did what they had to do to get the job done. They stayed quite late and got the logs in for the next day.

It was decided that it would take us down too long to try and rebuild the server. Additionally, the server was only a year out for its scheduled replacement. Add in the fact that it had never functioned properly from day one, and it was an easy decision to purchase a new one and start fresh.

We are in the process right now of getting that server ready. The engineering staff is working with an outside consultant to make sure we get it right. At the time of this writing, most of the work is done and we should be transferring to the new server any day. Once it is stable, we will move Visual Traffic from the Windows 10 workstation to the new server.

In between all of this activity, we have been trying to get a major project underway. We are building a coax switching network at the WSRB transmitter site that will allow us to quickly move the Nautel GV5 transmitter from the main antenna to the aux antenna that will have dual frequency capability. That will allow us to use the frequency-agile capabilities of the GV5 and put WPWX on the air from this site as an emergency site. It will be a lot of work, but well worth the insurance it represents for the important station that will benefit. If we ever have to use it, we will have to get an STA from the FCC to permit what would otherwise be a non-compliant operation.

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

The computer saga continues with the aftermath of the transition to a new computer platform for KKPZôs NexGen system. The modern broadcaster is dependent upon computerization to manage, program, and generate ongoing content on a 24/7 basis.

The old Windows XP platform became the standard for specialty third party applications spanning the spectrum from billing, and payroll, to stocking and assembly line production. The XP reputation was earned by its stability, reliability and consistency.

Even with that in the early days, there was the omen of things to come in the implementation of word processing and other Windows applications. During the early days, jokes about auto-incorrect and misspell miss-corrector were included as part of test processor programming. What Shakespeare wrote about a Malaprop character who knew the auto-malaprop would be included as a new computer feature.

The objection here is to the inclusion of features which are best described as the computer programmer knows better than what the user really wants. Later versions of Windows have taken that many steps further as options and choices have become smaller and less flexible.

Many broadcast engineers have lobbied to move applications to Linux, which in many ways is a superior platform for third-party software. Current vendors with large investments in Windows development are hard pressed to discard that installed base in favor of a new platform. New products may well have the opportunity to make the move.

In the word processing arena, I often send

documents to a wide audience. Based on feedback, I have chosen to share documents in DOC or PDF format. Many computer users cannot read DOCX or other newer formats. Most everyone can convert the DOC and PDF formats as users are moving away from single sourced platforms.

Meanwhile we have to deal with Windows 10 and its shortcomings, not the least of which is the constant updates. Forced updates and uncontrolled reboots of a platform running a 24/7 critical application is not welcome.

At the network level, the new system has made unexpected demands on performance. In some places, the KKPZ network was sub-gigabit. In terms of capacity, the network was more than adequate with low throughput loading. Windows 10 delays were another matter. When starting an audio element via the B-bar, the audio would hesitate, then play normally. The throughput wasnôt close to loading the path, yet gigabit capability is necessary to for proper operation.

There is an old computer saying: ñThe clutter of the operating system expands to fill all capacity of the latest hardware speed upgrade.ò Well, maybe itôs not an old saying, but it sure ought to be.

Rocky Mountain Ramblings
The Denver Report
by
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The month of October was different for me. I work with my dad. I love working with my dad. I love our daily drives to get lunch or just drinks for lunch. Itôs our time to talk. He likes to tag along when I go to do work at the transmitter sites. We are very close, and having him not at work this month has been tough. In some ways I do use him as a crutch as if I cannot figure something out on my own, he can step in and get his eyes on the issue. This has been a sink or swim type experience.

Interference Issues

Iôm not going to lie, I do worry about having an issue happen where I am in over my head. Guess what happened? I received a call from an FAA contractor saying that 94.3 FM (KLVZ) was causing interference on a Denver International Airport approach frequency. This is obviously not good at all. I ran some tests with the guy to determine it was for sure 94.3 FM. Evidently it is a combination of 810 AM and 94.3 FM, but I havenôt figured out any combination of those two frequencies that would result in a product on 122.95 MHz.

The next day, I went out to work on the issue but could not find it. He had sent me pictures of his spectrum analyzer, so I set ours up to match his, but I could see no product. So I left. There was nothing to do when the issue was nonexistent.

The next day, the issue returned. Thankfully, I was able to get to the site quickly after receiving the call. I could finally see the product on the spectrum analyzer. I began going through each piece of equipment. I would unplug each cable and wait until I unplugged the po,wer to that equipment.

At first, I thought it was the Omnia, as when I disconnected one of the cables, the issue disappeared. I called my dad to discuss what I found. It had been at least five minutes with no issue. Even on the phone, to confirm with him, I would plug the cable back in, the issue would return then Iôd unplug it and itôd disappear. Near the end of our phone call, with the Omnia disconnected, the issue returned. So, I began moving on to other equipment. After a couple hours of various testing with Keith, we found the issue to be the BW TX600V2 FM transmitter. So at this point, not wanting to have to leave the station off the air, I began lowering power a little bit at a time. I found that at 450W (normal TPO is 514W), the issue would disappear.

During all this I was in constant communication with the FAA engineer. He became less than cordial as I continued dealing with it. I would ask him simple questions, nothing about him coming out to do the work, just wanted to see what

he was seeing at that time ¿ñI did this, do you have any reports?ò types of questions. Once he started threatening me with FCC enforcement action, my dad got in touch with Nikki Shears, who is head of the Denver Enforcement Bureau office. She called me about the issue to discuss what we did and was very helpful. My dad had already applied for an STA to accommodate the reduced power operation and give us time to deal with the issue.

I guess Nikki was receiving reports from a station in Nebraska about interference on another aeronautical frequency. It could be a complete coincidence or not. I am awaiting a callback about scheduling a test with the site in Nebraska to see if it is indeed 94.3 FM causing the interference. At this point, I am assuming that no news from her is good news.

Until then, we have six months to find and fix this issue. FM radio is still a little bit out of my wheelhouse. We have some ideas what to do, but my dad wants to be able to come out and look into it himself. With his current health issues, he cannot do that. The hope is that six months will allow the time for him to heal and get back to work fully.

Power Modules!!!

We are very grateful that the NX50 power module issues we had at the 670 KLTT site have decreased significantly. For a long while, we would have a power module go out each month. We would repair and wait a month or so until the next one had an issue. The last issue was in May of this year.

This month, the same module we repaired in May blew again. It was middle of the night, beautiful night, clear, no weather whatsoever, while operating at low power (1.5 kW). Another ñblue-skyò failure (although it was more like a ñblack-skyò failure, or is it a ñstarry-nightò failure?).

I went out a couple days later and worked to repair it. I found the power amplifier MOSFETs to be good, but all three modulator MOSFETs were bad. The fuse was good as well. I began replacing each modulator. This is always a chore, but thankfully it is something we can do. I got the module repaired, tested and put back together shortly before power change that morning. I did notice a high DC current alarm, but as soon as it switched to the day power it was fine. I didnôt think much more of it.

That night at pattern change, I received the email alarm that the power module had again failed. I went back out a week later and looked things over. I double-checked that everything was good, and it was. I decided I would check the solder joints. I added some solder to several areas and made sure there was a good flow-through. That seemed to fix the issue. I mustôve had a poor connection that only appeared at low power. I am grateful that no components were damaged because of this mistake.

UPS Issues

When I was dealing with KLVZ-FM, I found the APC UPS in the translator equipment cabinet was showing an alarm. I also had an issue at the KLTT-FM translator cabinet as well. The battery wasnôt bad, but upon entering the studio engineering room one day, I saw the APT Horizon codec for that station had an alarm. I was able to quickly figure out the FM was off.

Out at the site, when I pulled up to the tower, I could hear the UPS screaming at me. A simple reboot bought the UPS back up.

What this brought to my attention is that since those FM cabinets are at the towers, I may not get eyes on them that often. I typically donôt just go look at things unless there is an issue. I will need to make sure to check for alarms on equipment just in case something like this happens again and make it a point to check those cabinets every couple weeks or so. I was able to get the replacement battery in for the APC UPS and got it installed and working. And no more issues from the other unit.

For all my engineering friends who may have an equipment cabinet at the tower or elsewhere that may not have eyes on it regularly, make it a point to just go and open it up to get a good eye on things and make sure all looks good. Could save you trouble at a later time.

First Big Snow

As I write this, we are experiencing our first big snow of the season. By big snow, I mean up to a foot spread out over four days. I hate driving in snow. You have the people with four-wheel drive who think that means they can go the speed limit when there is a nice layer of ice under the snow on the roads. What they donôt realize is they cannot stop easily. Then you have those people who drive way too slow for the conditions. Their cars arenôt meant for the snow or they just have no clue what they are doing. This makes driving difficult for those of us who have experience and know how to safely navigate the roads.

We received several inches of snow Sunday into Monday. It will clear up later today with another system coming through Tuesday that is supposed to bring upwards of 7 inches by end of the day Wednesday. I enjoy the snow some, not the cold. And I am not looking forward to going out but, itôs

one of the things we have to deal with living in Colorado, so I will suck it up and deal.

I pray you all stay safe and have better weather.

That about covers it for this edition so until next timeé thatôs all folks!!!

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
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, 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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