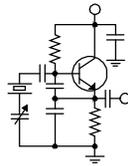


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

MARCH 2016 • VOLUME 26 • ISSUE 3 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR

Translator Update

The AM-only translator window has been proof of something I have long suspected & when the FCC wants to move quickly, it can. Until now I have seen little evidence of that fact, but in this window wow! The Media Bureau has been plowing through the applications, and ours were among those granted in the first two weeks following opening of the window.

As you may recall from last month's *Local Oscillator*, we filed four translator applications: Costa Mesa (KBRT), Denver (KLDC), Detroit (WEXL) and Birmingham (WYDE). We filed in the early morning hours of January 29, so our applications were near the top of the pile.

On the Monday following that Friday filing I started plowing through the applications filed to see if we were mutually exclusive (øMXö) with any other applications. I found that Costa Mesa and Denver were fine, but Detroit and Birmingham were MXed with other applications.

Immediately I began looking for ways out of the MX situations. In both markets I found other frequencies that gave us the same power and coverage, and very quickly we filed amendments specifying the new channels.

I had to wait until the next day to see if we were in the clear on those two. I had to laugh a little bit. In Detroit, the applicant we were MX with was Salem. When I was about to click the öFileö button

for the Detroit amendment, I called our attorney and asked him to call Salem's attorney to advise them what we were doing. I did not want Salem to follow us to the new frequency and re-create the MX. As it turned out, Salem also filed an amendment but for another frequency altogether. When all was said and done, the original channel we were MXed on was empty and available.

Early in the week of February 15, the



The array of antennas at the Denver Lookout Mountain site where our new translator will be sited.

notifications that our applications had been granted started rolling in. All four applications were granted, and I have CPs in hand for the translator relocations. We still have to wait for FCC approval of the transfer of control of the four translators from the sellers to Crawford's license entities, but that should take place this month. With the transfers granted, we will close on the purchases and the translator CPs will be ours.

Now we move from the realm of possibility to one of planning, pricing and ordering equipment. Translators are a new world for me. I understand the concepts, certainly, but I had to quickly educate myself on equipment, antennas and other aspects of translator operation.

Naturally I started looking at Nautel when thinking about transmitters, but after asking around a different brand started emerging: BW Broadcast. BW, which is a UK-based manufacturer, evidently makes a first-rate product that even our friends at Nautel speak highly of. They are very reasonably

priced and have just the right set of features for our applications. They also come in 30, 50 and 300-watt packages.

I also had to learn about antennas. Many translator antennas are Yagis or log periodics. One of our applications (Costa Mesa) called for a five-element Yagi. Denver had tighter protections and called for a ten-element Yagi. In Birmingham we had some room and were able to go with a five-element circularly-polarized Yagi, and in Detroit we had a tight protection to the south but some room to the north and we specified a log periodic with horizontal and vertical elements.



KBRT's translator will use a Scala HDCA-5H like this one.

In California, Birmingham and Detroit, we will use our own sites for these translators, but in Denver, we will have to lease some space up at the Lookout Mountain antenna farm. Amanda and I went up there last month to look around and get an idea of what we would have to do. There is a lot of stuff at that site. In addition to tons of Part 101 fixed microwave there are several translators at the site, and it sits in the midst of a lot of high-power FM and TV signals. Entercom's site with a couple of 100 kW stations combined into one antenna is just 400 meters away (and one of those is only 400 kHz from our frequency). I figured the power density from those two stations alone would be only 27 dB below our own carrier at our transmitter output. Very likely we will need some filtering, so I added a fairly tight bandpass filter to the equipment list for that site.

The Birmingham and Detroit installations are straightforward and relatively easy as the equipment will go in the racks in our transmitter buildings and the antennas will go on our towers as but in California we will mount the translator antenna on tower #1 of the KBRT directional array. That will

require an isocoupler and some kind of weatherproof, temperature-controlled cabinet that I can place at the tower base. I will also have to figure out a way to get Ethernet out to that tower for audio and control.

Our friends at Kintronic Laboratories will supply the isocoupler, and they also have the temperature-controlled weatherproof cabinet that we need. That takes care of two of the issues.

As for the Ethernet, it occurred to me that we have multimode fiber out to tower #1. It splices inside the ATU and connects on up to the microwave radio on top of the tower. What if we put a small (10-port) Cisco switch with a couple of GBIC ports in that ATU, stuffed the GBIC ports with SFP multimode fiber transceivers and plugged the two fiber LCs into those? That would eliminate the splice and give us eight gigabit ports out at the tower. All that sounds wonderful, but will it work in the high RF field inside that ATU cabinet? I guess there is one way to find out. If it doesn't work, a plan B would be to use a pair of Ubiquiti Nanobridge M5 Ethernet radios and 1-foot antennas to create a point-to-point wireless link from the transmitter building to the tower #1 base area.

At this point we have equipment ordered and await word on delivery dates. We hope to have Denver on the air before April 1. The others may take a little longer. I think Birmingham will be our biggest challenge because tower workers are so hard to come by in that region.

What do we expect from these translators? Both California and Denver are, for the moment, horizontal only, so we'll have that factor when dealing with mobile receivers. Longley-Rice studies show that KBRT's translator will cover all of Corona, Norco and a good bit of Riverside with a listenable signal. Denver should have close to a full-market signal (excluding the far north and far south suburbs). Detroit will cover a nice-sized area north of our central-Detroit tower site, extending into the northern suburbs, and Birmingham will have close to a full-market signal. Both Detroit and Birmingham will be either circular or horizontal and vertical, so mobile reception should be good. All four of these translators are on clear channels (i.e. there are no nearby co-channel stations to give them grief).

I am excited at the prospect of four new FM signals in some of our most important markets. Time will tell what value they will add to the operations there.

Changes

You will likely notice a very conspicuous absence from these pages. Brian Kerkan's column is

missing, and for good reason. Brian has left our employ to take a position with the Telos Alliance as an audio processing sales engineer.

It goes without saying that I am not very happy with this development, but we wish Brian the very best and look forward to working with him in the future both on Detroit projects and with regard to Omnia audio processing products.

At the moment we are doing a recruitment for Brian's replacement. By next month's issue I hope we will feature a column written by our new Detroit chief engineer.

Amateur Radio

I've written about Amateur Radio in these pages on several occasions in the past. What does Amateur Radio have to do with broadcasting? Quite a bit, actually. It was through Amateur Radio that I came into my broadcast engineering career. As a teenager I found myself fascinated by the glow of electron tubes and the mystique of transmitting and receiving across the ether. I would see the towers of my hometown AM directional array and wonder what the equipment looked like inside those buildings at the tower bases. Eventually I put in an application at that station and it was there that I landed my first job in radio. The rest, as they say, is history.

We have a good number of licensed Amateur Radio operators in our company. There is John White, Steve Minshall, Amanda Hopp, Rick Sewell, James Kelly, and Brian Cunningham (my apologies if I missed anyone). Here in Denver we have a 440 MHz repeater where a bunch of broadcast engineers hang out and talk shop. And of course the SBE has a couple of hamnets, one on Sunday evenings on 20 meters and another on alternate Mondays on Echolink, the Internet Radio Linking Project (IRLP), VHF and UHF where broadcast engineers who are licensed amateurs get together to discuss the industry, their projects and other topics of interest.

Amateur Radio has several grades of FCC licenses: Technician, General and Extra Class. These license classes or grades have increasing privileges. Most folks these days start out with a Technician class license and upgrade as their skills and technical knowledge develops.

Amanda, who started out as a Technician and upgraded to General several years ago started studying for her Extra Class license a few months

ago. In mid-February she took and passed the exam, so now she has the highest level of Amateur Radio operating privileges. Her husband Jordon recently took and passed his General Class exam, upgrading from Technician. And good friend Robert Payne (whom many in our company know) just passed his Extra Class exam.

It has been fun watching Amanda begin to use and enjoy her new operating privileges. She has a new HF (shortwave) transceiver and recently got a Signalink USB, a computer-radio interface that allows operating with many digital modes (including slow-scan television). Seeing her excitement and enthusiasm has revived my own (and I have been licensed since 1974). Evidently it has rubbed off on her husband, too!

Amateur Radio dovetails very well with our chosen profession and yet provides a useful distraction. Amateur Radio has something for just about everyone. Old guys like me enjoy getting on the HF bands and visiting with friends old and new. Those with more local aspirations talk and send data over VHF and UHF repeaters as well as microwave links. Experimenters build and operate their own equipment. And all can provide public service in the event of emergencies.

One very interesting activity that many Colorado amateurs participate in is balloon launches. These folks, in conjunction with other groups and academic institutions, launch what are essentially weather balloons with payloads of all kinds of equipment. The amateurs track and chase the balloons, recovering them and the equipment packages after they land (often 100 miles or more from the launch point).

I would encourage readers of these pages who are not licensed amateurs to think about getting into the hobby. It doesn't have to be expensive. You don't know what you're missing.

If you'd like to get a taste, there is a great online software defined receiver (SDR) at: <http://w7rna.dyndns-remote.com:18901/>. The receiver is located in Arizona.

Select the desired band and enter the frequency in kilohertz. Generally speaking, 80 and 160 meters are nighttime bands. 40 meters is mostly a daytime band, although there is some activity at night. The frequency display shows what you can expect to find at the various frequencies.

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

Hello to all from Western New York! As I had mentioned in last month's report, my family and I were preparing to move our households to a new location in the suburbs of Buffalo, and as of the time of this writing, we are settling into our new homes. To say this move was tough on us physically is an understatement. The last major move I made was to Buffalo from Kentucky some 25 years ago, and my energy level has subsided considerably in that time. There were times when we thought we wouldn't be able to get everything done, but by the grace of God, we are finally done and working to get our households in some kind of order.



I have mentioned in previous columns that I am somewhat of a packrat; I don't like to throw things away that seem to me to still have some useful value. As we were cleaning out our old house, I was shocked at the amount of "junk" I had collected over the years, thinking I would have a need for it later. There were numerous power supplies, modules from old consoles, tubes, assorted electronic parts, various pieces of equipment in various states of disrepair, nuts, bolts, assorted connectors, and tons of old equipment manuals. Now I'll admit, it wasn't as bad as some of the episodes you see on A&E's hit show "Hoarders," but there was a lot of junk! I simply couldn't move all this stuff to the new house, so out it went. In fact, I was so focused on removing all the clutter that I even cleaned out the engineering workshop at WDCX, throwing out everything that didn't have either value or a presumed immediate need. It feels good to not be burdened with all the junk, and hopefully I can continue this newfound clutter-less lifestyle!

Right in the middle of our move, in the early morning hours of Saturday the 20th of February, I got a call from our PD that WDCX-FM was off. We had carrier, but no audio was being broadcast. As we simulcast WDCX-FM on 97.0 WDCZ, I had him check to see if everything was good there, and he reported it sounded fine. Next I had him check the STL transmitter to see if it was operating and sending

audio. Again, no problem. That indicated that the issue was at the transmitter site, 25 miles south of the city.

I quickly dressed and headed towards the transmitter site, playing the "what-if" game in my mind as I drove. We have had some issues in the past with moisture in the STL line, and I was relatively confident that I would find both STL receivers muted from signal loss due to water in the line.

Upon arriving at the transmitter site, I immediately noticed that the Omnia 11 audio processor had locked up. I tried to reboot it, but it kept hanging when trying to load the I/O http server board. In order to get us back up the quickest, I removed our Omnia6.EXI from the HD-2 audio chain and reprogrammed it to feed the Nautel transmitter's analog and digital inputs.

Back on the air, I began to look for the cause of the failure. While removing the processor from the equipment rack, I noticed that the backup transmitter's exciter had faulted out, along with our analog back-up STL receiver and TSL transmitter. I attempted to reset the fault in the BE FX1-60 exciter, but the fault kept recurring with a warning that the composite signal was missing.

It was beginning to dawn on me that almost everything in this rack was down, so I checked the surge protector and likely found the cause. One of the 115-volt modules was bad, along with the ground/neutral module. We must have taken some kind of surge during the nighttime hours. A look at the fault log on the Nautel transmitter indicated that the power had dipped momentarily at 2:03 AM, and the log was indicating a bad controller PS module also.

I also found that the composite DA was affected on two of its outputs, one that was feeding the composite input of the BE exciter and the other one that fed the FM demod module. Replacement of the bad chips in the DA took care of that problem, but the remainder of the equipment likely will have to go in for repairs. We had high winds throughout the

night, with sustained wind measured at 40 mph in the city, so winds at the much higher elevation transmitter site could possibly have reached speeds greater than 40 mph, causing problems with our electrical service.

At the WDCX(AM) transmitter site in Rochester, we were experiencing an odd problem with tower 6 phase readings on the night pattern. It would read properly for several nights, then read very high for a night or two, and then return to normal. After discussing this with Cris, he suggested checking all the clips on the inductors to insure that all were tight and making good connection. I did find one that was suspect, changed it, and returned to the night pattern, only to find that it again had skewed high.

After leaving it in night mode for a length of time, I checked all the components with an infrared thermometer to see if anything was heating up, causing the phase to change. Finding nothing there, out of desperation, I switched the inputs of towers 5 and 6 on the back of the phase monitor to see if the problem moved or stayed the same, and the reading for tower 6 was perfect on tower 5, and 5 was perfect on tower 6 input! It seems that the center conductor of the tower sample into the antenna monitor had oxidized to the point that it was not making good contact with the female counterpart. A good cleaning with scotch-bright did the trick, and the readings have been solid since.

While on the subject of Rochester, the weekend of February 13th saw brutal temperatures and wind chills in the Northeast. On that Saturday evening, I began to get calls from the WLGZ-FM Burk VRC-2500 that the transmitter power out was zero percent. The plate voltage and current were reading a little high but no output power was noted. Temperatures at that time were -15 degrees, and as there is no heat in this building other than the transmitter's exhaust, I knew that the problem was temperature related.

Unfortunately, the remote called me every hour all through the night with the low power alarm. On the Burk VRC-2500 you can mute the alarm reporting for only 1 hour, so it called throughout the night. Early on Sunday morning, with the

temperature at -20 degrees, I made the trip over to Rochester to try and get some heat into the building.

Upon arriving, I found the inside temperature at 0 degrees. Since I installed the new tube in the Continental transmitter, it does not put out much heat at all. The normal heat rise posted in the transmitter manual is 75 degrees, but running at only 9 kW TPO, it is realistically about 36-38 degrees above ambient. The tube tuned very efficiently, reducing any additional heat generated from the plate. As the transmitter exhausts into the room, and the air intake was so cold, there just was not enough heat generated from the tube to warm the room.

I purchased a thermostatically controlled oil heater from Home Depot to help warm the air in the building. It took quite some time, but I was able to get the room temperature up to near 40 degrees, which ceased the hourly alarms. Before next winter I will be looking for an alternate way to heat the building when temperatures dip into the negative readings.

Back at the WDCX-FM studio, we are continuing to experience problems with our Internet service from Verizon. It seems as time goes on, it is getting harder and harder to contact them to report issues with the service. As late as last Friday the 26th, I spent well over 4½ hours on their in-queue hold, waiting to speak with someone in technical support to report the issue of the Internet cutting in and out. As we utilize this service for our streaming service and IP connection to our Rochester station, it is imperative that the utility works flawlessly. We do not have much in the way of options for Internet service in Buffalo; all that is available is either from Time Warner (max 35 mbps cable internet) or Verizon DSL. Currently there is no availability of fiber optic service within the city limits of Buffalo, which would in all probability solve most, if not all of our issues.

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

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

Ah, another month has passed and as I write this, we're headed to the polls for the "SEC Primary" on March 1st. A very heavy turnout is predicted, but we'll see. The big news here is that Jeff Sessions, our very popular junior senator from Alabama, has endorsed Donald Trump for president. By the time you read this, we'll know how that worked out, too.

But I can tell you this, Trump is very popular here in the South. Figure 1 is a picture taken Sunday, February 28, not at his event in Huntsville, but at just one of the auxiliary parking lots. Trump had three buses running in a constant loop to get people over to the stadium where he was speaking. Many of these people never made it in; the fire marshal declared that the facility was filled to capacity, so that was that.

Our station was going to participate in a



People queued for shuttles to see Donald Trump in Huntsville, AL. An estimated crowd of over 30,000 people came to hear him speak.

Candidate's Forum at Samford University here in Birmingham on Saturday, but all of the candidates but Marco Rubio pulled out. Management decided



that it would be inappropriate to do a two-hour free advertisement just for Rubio, so the plans to air the Forum were dropped. But I know that several of our staff went to the event.

It's kind of neat to see this kind of attention being given to Alabama. In the past, we voted in June and as often as not, the primaries were essentially decided before we had a chance to stick in our two cents worth. This time, Alabama matters. It's kind of

cool.

AireSpring

Our new ISP, AireSpring, installed a 20 megabit MetroE link in January. 1.5 megabits of that was reserved for a standard PRI, leaving us about 18.5 megabits of upload and download for Internet service. This is shared with our mail server.

I mentioned last month that this was a breeze to bring live; I should have known better than to run my mouth. In February, we began having problems. The Internet would drop from time to time, but worse, so would the phones. The poor folks on our morning shows were about to pull their hair out. It seemed like every time they'd have a contest or a call-in, they'd line up a bank of calls ... and they'd all drop at once.

Intermittent problems are the worst, by far. We all know that. They're especially annoying when you can't decide whether it's your equipment or the service provider. In this case, though, it was pretty obvious that our new ISP was probably the issue, because our phones had been working just fine prior to the switch over.

We called AireSpring and they said that

didn't see anything obvious, so we kept looking. We asked our employees to be patient and to keep a log of dropped calls. Finally, we found what we had been looking for: both WYDE FM and WDJC dropped calls at the same time one morning about 6:15 AM. At the same time, the Internet stopped working.

That meant that our phone system was probably OK. Our firewall was probably OK as well (ClearOS makes a fabulous firewall, but ask anyone who uses it: it's quirky). This time, we called in Stephanie Crawford, who has helped us many times in the past (and in fact, it is she who helped us get the AireSpring service). They put a running monitor on the Adtran gateway ... and discovered that it was rebooting itself roughly once a day.



AireSpring uses an Adtran 900e to provision our new service.

Those of you who are familiar with Adtran know that their stuff is generally bulletproof. It's as geeky as all get out; you need a PhD in chaos theory to program some of the higher-end stuff. But our experience with them has been that, once you do get them programmed and configured, they're battleships. They just chug along.

Therefore, we suggested to AireSpring that they carefully review their programming and setup. They didn't tell us what they did, but we stopped having dropped calls for several days. All is well!

... well, maybe not. We started experiencing drops again; AireSpring checked one more time and tweaked a few more things. So far, so good.

I guess this is the Bright New Future¹ : most of you probably know that everything is IP now, including phone service. If you have a T1/PRI for phones, unless you live in Ruptured Rump, AK, it's probably coming to your facility as IP over fiber. Something like our Adtran will either be in a box at the street, or (in our case) even inside the facility.

Many folks have even bypassed the PRI now; they're using straight VOIP and SIP for phones. We'd be upgrading to that sometime in the future here in Birmingham, and that's fine, too. But man,

how things have changed.

For the remainder of this article, I'd let Todd Dixon tell you about the solution to our long-standing NexGen issue. (We hope.) Until next time, keep praying for this nation!

NexGen: Resolved! (?) Todd Dixon, CBRE

It began in April of last year. After running relatively worry free for almost eight years of operation in our current location, NexGen became extremely flaky. Many of you know that we have had a problem for nearly a year now where the WDJC-FM audio server (ASERV) machine would routinely hang. Occasionally, the hang would allow the workstation to continue playing (thus, keeping us on the air) in NexGen's local database mode. More often than not, coyote.exe would simply hang badly and we would be off the air. Of course, this was always in the middle of a REM sleep cycle or some once in a lifetime family celebration. A simple restart of NexGen would bring the station back to life for another two to three days.

The classic indicator, besides being off the air, was that red bar on the NexGen screen saying that the "Secondary Database is not in sync" and the control room screen would be blank. In each case, the output from the localviewer text file, which is a comprehensive station activity report, in the C:/hlc directory indicated a repeated "Error 10060". Basically, ASERV4 was knocking and nobody on the network was answering.

We tried a number of options before we ever called RCS: we swapped the workstation for a similar, different one, and network cables and power cables were all interchanged. The problem followed the whichever computer was named ASERV4 (WDJC's). It stood to reason WDJC's full time music format touches the database server much more often than our talk format or religious long-form programming do.

We opened several tickets with RCS and everyone in our market was getting a little restless that the problem hadn't been resolved yet. Unfortunately, a problem like this one wasn't one where you throw everything against the wall and see what sticks. It required changing one thing, waiting and seeing if it had any effect. Changing another and observing differences.

We scheduled a visit from an RCS support field technician and he found a number of tiny adjustments that we could make at each workstation in the system. Nothing major, and certainly nothing that would cause NexGen to hang at only one

workstation. The biggest change that he recommended, and which we implemented, was One Big Switch instead of several smaller network switches.

Time marched on with the problem continuing to rear its ugly head, but we decided to push on and wade through our WheatNet-IP blade project in October. It was a fairly comprehensive upgrade to our hardware. Besides the blade installation and network installation, we were changing out nine NexGen workstations for new ones and upgrading the hard drive, RAM and operating system to Windows 7 of the machines that weren't replaced.

In our early preparation, I had contacted RCS about how to setup Windows 7 for NexGen operation. We went through every new and upgraded workstation with those recommendations. When everything was installed and upgraded, we again began experiencing the problem with regularity in about a 36-hour window. As ridiculous as it sounds, our solution became for Stephen to remote in to the machine every night while he was checking other corporate servers and reboot NexGen on WDJC's newly upgraded workstation.

After things settled down from an internet service provider change at the beginning of the new year, it became my sole mission to get this problem solved. I picked up an email thread that had been left since September and asked RCS support to jump into our system and see what they could find. He tweaked ASERV4, with the following changes:

1. Echo requests in Firewall Specifically Allowed for the Private profile
2. Windows Defender disabled
3. Forced Network Profile to Private for all Unidentified networks

He also included an updated Windows 7 settings list with several more recommendations that were not included in the original list. Jack and I went around to every one of our workstations and implemented those changes as well. He also asked us to not restart the machine until it actually crashed again so that he would have some data from a crash to work with when it happened. I am happy (actually ecstatic) to report that the machine hasn't crashed in nearly two weeks!!!

Ultimately, I think the problem was in Windows 7's incessant need to try to be connected to a "public" network (think internet or coffee house). In 7, Microsoft finally got their minds right about network security and offered real differentiation between a home, work or public network. Being on a

public network vastly restricts the actual data that is passed across the network. The NexGen network needs unfettered access to the network and was being choked off by the public network profile. In particular, the ASERV4 was having to fight for every piece of data that it received from the network. Correcting that issue has created peace on our network and in my soul.

The RCS recommendations for Windows 7 are on a separate document along with the clarification of what Jason Bonds, the RCS support technician and my new hero, actually changed to get our workstation happy.

Here is an edited version of Jason's specific recommendations. Hopefully, everyone else will find this useful.

1. **AV** – Ensure that there is no Network or Proactive Threat Protection present in your AV software.
2. **Windows Firewall** ó Ensure the Windows firewall is set to **On** and set to **allow** all **inbound** and **outbound** connections for all network profiles and have 4 rules setup in both inbound and outbound portions.
 - a) Program rule > c:\hlc\coyote.exe > Allow > All profiles
 - b) Port Rule > TCP ó All local ports > Allow > All Profiles
 - c) Port Rule > UDP ó All local ports > Allow > All profiles
 - d) Custom Rule > All Programs > Protocol type: ICMPv4 > Any local & any remote > Allow > All Profiles
3. **Video Drivers** ó Ensure the 3D settings are set to Performance instead of Quality.
4. **Network Profiles** ó Ensure that your NICs are all configured for the Private (Work) profile.
5. **NIC Settings** ó Ensure the following settings have been configured:
 - a) **Flow Control** ó Ensure that Flow Control is off on the switches and all NICs.
 - b) **Port Speed/Duplex** ó Ensure that port speed is locked (if 10/100 switch) or set to Auto (for Gigabit). You should also ensure that the same values are configured on the switch.

- c) **Power Management** ó If supported by the NIC, we need to disable the ability to turn off the NIC when in Power Saving mode.
 - d) **IPv6** ó NexGen does not support IPv6, so we need to make sure this has been disabled on any active NICs.
7. **Other Windows Settings** ó We should ensure the following Windows settings have been configured.
- a) **Windows Time** ó Ensure that the **Windows Time service** is disabled and that **Internet Time sync** is unchecked.
 - b) **Power Management** ó In the Power Management settings, ensure the Minimum CPU % is set to 100. In addition, we need to make sure that the system is set to Never turn off hard disks or the monitor and that any hibernate features have been completely disabled.
- c) **User Account Control** ó Ensure that UAC is disabled
8. **Virtual Memory** ó Ensure that the Virtual Memory settings are set to System Managed.
9. **Scheduled Tasks** ó We need to make sure that the scheduled defrag added to Windows by default has been disabled.
10. **Local Security Policy** ó Ensure that Network Security: LAN Manager authentication level is set to Send LM & NTLM ó use NTLMv2 session security if negotiated. This is located in Administrative Tools ó Local Security Policy ó Local Policies ó Security Options.

The Chicago Chronicles

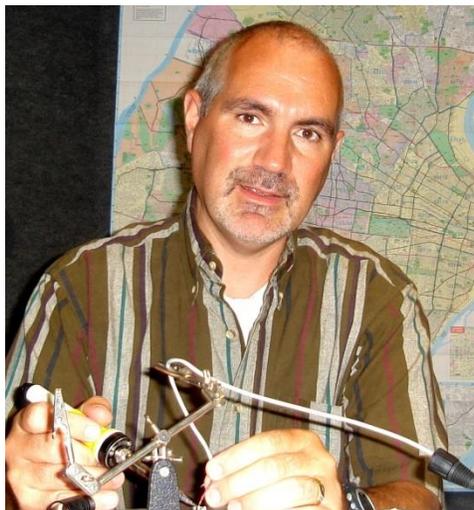
by

Rick Sewell, CSRE, CBNT, AMD
Engineering Manager, CBC–Chicago

There are various approaches in this modern era of radio broadcasting to how much the staff members occupying the control rooms participate in actual transmitter site control. I have worked in situations where it was almost all walk-away operation so there was very little participation by board operators in transmitter site control. I also worked in places where, despite having sufficient staff, the board operators still didn't participate at all in transmitter plant operations. It was incumbent on automated equipment and engineering to monitor and intervene as necessary to keep sites on the air.

When I became part of Crawford's Chicago cluster engineering department, transmitter operation was very much dependent on the personnel in the control rooms. They did all the readings, tower light checks and turned on the auxiliary transmitters and STL when needed. I have never liked this approach because you're so

dependent on people who have programming first in mind and look at transmitter site duties as something they have to do.



I was very glad that we were installing the Burk ARC Plus Touch remote control units when I first arrived here. I knew that I would be less dependent on board operators to get things right. Even though the engineering department would be notified of transmitter plant alarms via remote control, it was decided to keep the board operators involved as a line of last defense in case remote control problems occurred and engineering didn't get notification properly because of such an incident.

So we kept board operators in the loop taking regular readings and continued training them on how to go to the backups. However, I found that the operators usually turned on the backup transmitters when it wasn't necessary, and when they did, they didn't turn off the main

transmitters and/or also didn't turn on the accompanying auxiliary HD transmitter. All our sites have the aux transmitters on the aux antennas, so it is possible and does happen where we can have two transmitters on at the same time. I solved part of the problem by running a macro in the ARC Plus Touch remote control units that whenever they see the status of both transmitters as on, they will send a text message to engineering so we can intervene and correct the situation. Even with this measure in place I still wanted to simplify these type operations for the board operators.

Another problem I wanted to address at the same time was to better improve notification of the auxiliary transmitter going off air when it was being used in emergency purposes. We could do it through the channel on the remote that reads the aux transmitter's forward power, but we found we had to use email notification in addition to phone or text message notification so that engineering could keep its sanity.

The ARC Plus Touch units on a fairly regular basis reboot themselves or they lose their network link momentarily with the IP8 converter. When either of these occur, they will send out an alarm for the aux transmitter. So, getting awakened on a regular basis for a false alarm is not an option. But I did want notification of an aux outage when the aux transmitter is actually on the air during emergency operation.

What I was manually doing during these instances was using Autoload Plus to reprogram the remote controls to give phone and text messages for an aux alarm and then change it back when we were running on the main again. This is a process I wanted to eliminate.

So I decided to attack both these issues by using the virtual channel function in the ARC Plus Touch. On the command part of the channel I would have the raise function do everything necessary to take the station from the aux transmitter to the main transmitter. The lower function would do the opposite, everything necessary to go from the main to the aux transmitters.

With the virtual channel, the two command functions are actually launching a macro that will do

a step-by-step, line-by-line change over to the opposite transmitter(s). For instance, when going from the main to aux, it would turn on the aux analog transmitter, then the aux HD transmitter and then once the analog aux transmitter is up to a certain power level, turn off the main transmitter. At that point it sends an email message to engineering saying that it has transferred transmitters so we get notification. In the case where we have a tube transmitter, it would turn on the filaments, go through a hold for warm-up and then turn on the high voltage to the transmitter. The other macro would do the exact opposite steps.

This will very much simplify this process for the board operators. Plus they won't be leaving two transmitters on at the same time.

Since I have one site that has 32 channels on its remote control (WPWX), I decided to use channel 33 on all the remote controls for this virtual channel. The reason I did this was so we would only have one channel to remember for all the sites. It's hard being awakened in middle of the night by a call from the remote control with a station off air. Since every site is set up a little different, my fuzzy 2:00 AM brain only has to remember one channel for each site and know it's lower to go to the aux and raise to go to the main.

The other aspect of the virtual channel is its metering. What I did there was to combine (or sum) the forward power metering of both the main and aux transmitters. This would solve my issue of the ARC Plus Touch rebooting. This channel would be set to both use phone and text message if the sum got too low or too high. So, when we are running the aux transmitter in an emergency, we would still get notification of the aux going down. This channel is essentially notifying us that no transmitter is on air when it goes below a certain point. On the flip side, if it goes too high, it is notifying us that two transmitters are likely on the air at the same time. So, when the ARC Plus Touch does reboot, as long as one transmitter is on the air we won't get notified by text message or phone that the aux is off air. This helps me sleep at night, under either circumstance.

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

As press time approaches, another deadline is about to pass with no activity at the last tower which needs to be detuned on Mt. Scott. Excuses have been piled on excuses and the detuning never happens. Meanwhile, the KKPZ pattern suffers from pattern distortion in significant population coverage areas. Apparently, FCC orders to detune don't apply as money is spent on strengthening the tower and none is spent to address the damage done to a nearby broadcaster.



Meanwhile, in the sad town of Towerville, another tower has suffered damage to its detuning skirt. Is this beginning to sound like that old math story problem? The frog climbs three feet up the wall of a well each day, then slides back down 4 feet each night. I suspect the damage was caused by ice fall in early January. I have reported the damage, and there has been ample opportunity for the tower manager to make repairs. As can be seen from the photo below, the damage to the skirt is plainly visible and quite obvious.

I have noticed a change in attitude of tower owners and tenants since the new FCC AM protection tower rules took effect. The rules simplified the process of determining which towers will cause damage to AM antenna patterns. That attitude change seems to be that the rules no longer apply. In fact, the new rules are tougher for a detuned tower. When it is determined that a tower needs to be detuned, the obligation on the part of the tower owner is much more mandatory and specific than has been in the past. The station involved must be notified when any work is done, period.

At Mt. Scott, we have transmission towers at three different locations. The communications (rental) tower at KKPZ is always properly detuned (we own and maintain that tower and its detuning). The facility manager for the tower to the south, which is operated by PGE, is very cooperative. They

have posted signage which notifies tenants of the necessity to notify us when work is to be done. Since we haven't received any notification since the signs went up, I suspect that the signs are simply ignored.

I have asked for similar signs at detuned towers located at the water facility to the south. So far that hasn't happened. I suspect the current situation is that AM broadcasters will need to be aggressive in demanding compliance with FCC AM protection rules. At present, the situation here in Portland seems to be headed to a compliance discussion at the FCC.

They say fences make good neighbors. In our case, our fence appears to be a substitute for vehicle brakes as one driver after another uses our fence to stop after failing to negotiate a 10 mph curve. This time, the fence damage was reported to the driver's insurance carrier. Several new posts later, the fence is repaired and sports new reflective tape to warn drivers to slow down.



Skirt damage on a nearby detuned tower.

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

Is it March already? I know I say this every year but it really does go by fast!

Not too much has been going on in Denver. I've been maintaining the sites and doing some studio cleaning. One big thing though, is that we are gaining an FM translator for Denver, as are a few of our other markets around the company. It has been a lot of fun getting equipment in, setting it up and testing it. It is nice that the setup is so small. I've never dealt with FM and I have definitely never dealt with translators. They just make is so easy to fit in small spaces.

In the process of checking things out, we found a pirate station on the new translator frequency for Denver. That frequency should be completely clear, but last week a signal popped up there. I must say, the music the person plays is quite interesting. You could be listening to Hotel California followed by a song about marijuana played to the tune of The Devil Went Down to Georgia.

I went out with my dad in hopes of finding the station location. We purchased a VHF Yagi antenna from Lowes, made a cable and hooked it up

to our Anritsu spectrum analyzer and went hunting. We knew the station had to be near the office as that is where it is strongest. We went to several



neighborhoods/shopping centers measuring. We did narrow it down to a neighborhood to the northeast of the office, and then we nailed it down to a single house (we could see the antenna in the back yard).

We notified the FCC and one of their Denver agents stopped by the office. I must say, seeing numerous people freak out over the fact someone from the FCC was at the office

was fun. Thankfully it was not an inspection, even though I know we are ready for one. The agent went to the house and confirmed that it was the source of the signal. By the time he got there it had been powered way down. The guy might well have seen us wandering around with the antenna pointed at his house from the sidewalk out front and a parking lot to the rear. The next day the signal was gone. We hope it stays that way.

That about wraps up for this edition, so until next time! That's all folks!!!

The Local Oscillator
March 2016

KBRT • Costa Mesa - Los Angeles, CA
740 kHz, 50 kW-D/0.2 kW-N, DA-1
KNSN • San Diego, CA
1240 kHz, 550W-U
KCBC • Manteca - San Francisco, CA
770 kHz, 50 kW-D/4.3 kW-N, DA-2
KKPZ • Portland, OR
1330 kHz, 5 kW-U, DA-1
KLZ • Denver, CO
560 kHz, 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, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Denver, CO
810 kHz, 2.2 kW-D/430 W-N, DA-2
WDCX • Rochester, NY
990 kHz, 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

WEXL • Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ • Detroit, MI
103.5 MHz, 50 kW/150m AAT
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, 5 kW-D/41W-N, ND
WYDE-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT
WXJC • Birmingham, AL
850 kHz, 50 kW-D/1 kW-N, DA-2
WXJC-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT



Corporate Engineering
2821 S. Parker Road • Suite 1205
Aurora, CO 80014

email address: crisa@crawfordbroadcasting.com