The Local Oscillator

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Windows 10

Just about anyone who doesnôt live in a cave should know by now that Microsoft has released Windows 10 and is giving it away free to anyone with a valid Windows 7, 8 or 8.1 license in an apparent effort to quickly replace the Windows 8 nightmare. On most PCs running these operating systems, a white Windows symbol would mysteriously appear at the bottom right of the screen and clicking it would provide information about the free upgrade. After July 31, the actual upgrade was distributed and those who opted in could proceed.

Amanda was the first to be a test pilot for W10 and did the upgrade on her office desktop. When done, her desktop screen would flash on and off at random, as if someone were flipping a light switch on and off rapidly. She couldnôt click anything or bring up any menus. Worse, she couldnôt figure out how to get into the ñsafe modeò to try and troubleshoot the problem. She eventually had to do a ñrepairò from a W10 DVD. In the process, she lost all her applications but managed to keep her data. Within a few days she was back up and running and except for the angst and aggravation of the upgrade process itself, was generally happy with the W10 product.

I wasnôt unhappy with Windows 7 but figured that Iôd better do the upgrade so I could be prepared to discuss it with others in our company who would be asking about it. Hoping that my experience would be better than Amandaôs, I started with my personal machine at home, which was running W7 Pro Ultimate 64 bit. The upgrade went perfectly and in a little more than an hour, it was up and running on W10 with all my programs, documents and data intact. No flashing desktop. Iôve been using it for about a month now with no issues at all.

So that was one 32-bit Dell and one 64-bit HP done. The former had the flashing desktop issue; the latter did not.

That brought me to my office machine, a Dell running the 32-bit version of W7 Professional. I clicked the little Windows symbol and started the upgrade. An hour later I was staring at a flashing desktop, just as was Amanda a few weeks prior. A search of Google and the Microsoft support forums turned up a lot of folks who had this problem. For many of them, the fix was to disable two Microsoft services. It was possible to bring up the task manager with ctrl-alt-del and it would not be flashing (although the desktop beneath it would). From there I could run msconfig and disable the two services, both of which had to do with, of all things, problem/error reporting. A restart brought me right back to the flashing desktop.

I spent a full day on the issue before deciding that I was wasting my time. I did a shift-restart and clicked the option to troubleshoot and eventually wound up at a prompt that told me Windows would be reinstalled and that I would lose ñall programs that did not come on this computer.ò I had already backed up all my docs and data, so with not much to lose I clicked the button to proceed.

An hour or so later I was looking at a non-flashing desktop. All of my shortcuts were still there but clicking on any of them popped up a message saying the program could not be found. A quick peek at File Explorer showed all my data and docs still in residence, so my course was clear: get busy and start reinstalling programs. By the end of that day I was back to 90% or so, with email, word processing and most of my engineering applications back up and running. It took another half day to get the final 10%,

and Iôm sure I am still missing a few things that I wonôt discover until I really need them.

While I was installing one of the engineering applications that I use frequently (it was the nodal circuit modeling application that I used to smoke out the KBRT parameter drift problem), I had to stop and download/install Adobe Air, the runtime library that the app uses. Somehow, in the process of downloading and installing that app, a handful of other apps appeared on my desktop, apps I didnôt recognize and certainly didnôt want. And then a screen popped up and covered the desktop displaying a message saying that my computer was infected with malware and instructing me to call a phone number to have it removed. At the same time a female voice began broadcasting a 120 decibel warning of the same thing through the PC speakers. I could not close the window or get the blasted audio to shut off without turning off my speakers. I did finally get to task manager and shut the window and stop the audio message.

Amanda suggested that I try the free trial of Malwarebytes, so I rebooted and before the thing started screaming at me again, got the download of that program started. It scanned the system and found about 30 malware files all related to those programs I didnôt recognize and quarantined them. Problem solved. After making sure everything was working, I deleted all those files and checked the installed programs list to see if any remained ï none did.

I doubt very seriously if those programs actually came from Adobe. More likely I was fooled by a very real-looking link provided in response to my Google search for ñAdobe Air Download.ò The link had ñadobe.comò in the URL and carried the Adobe logo, but I suspect it was not actually Adobe. I have since gone directly to adobe.com, done a search on that site for ñAdobe Air Downloadò and found, downloaded and installed Adobe Air without any issues.

That was a multipart lesson well learned: (1) Donôt get in a hurry when installing software, particularly from downloads; (2) McAfee will not catch everything; and (3) Use the software developerôs direct URL and donôt rely on Google (or other) search engines to take you to a download site.

So how do I like Windows 10? So far, so good. Itôs a world better than Windows 8, and it has a whole new set of shortcuts and navigation challenges, but once you learn them itôs fast and easy to use. Iôm still trying to get a printer share to work with my XP notebook, and Amanda is working with our copier/printer vendor to find a 32-bit W10 driver for that unit, but otherwise Iôm reasonable happy. Ask me again in another month and I may offer a different opinion!

Projects!

This has been a summer of projects around our company, and the work continues. The WheatNet-IP project in Chicago is substantially complete. There is still one audio server that is giving us problems, but itôs a computer issue unrelated to WheatNet. Some of those older computers just donôt play well with Windows 7 and thereôs no way to know whether they will until you try it. We have a new PC on the way for that application and should have it replaced shortly.

Birmingham is gearing up for its WheatNet-IP project. Itôs the little things that will get you, like the security keys (ñdongleò) for Nexgen. The existing machines all use parallel dongles but the new hardware does not have parallel ports, so we have to do a wholesale swap for USB security keys. I wonder how long it will be before we find that new machines donôt come with USB ports so we have to do wholesale swaps for Thunderbolt (or whatever) security keys! Those USB keys are on their way so hopefully Stephen, Todd and Jack can get the project started in early September.

That leaves just KBRT to convert to WheatNet-IP, and weôve already taken some steps in that direction. The new KNSN audio server, installed last spring, was set up with a PC blade and a digital IP blade for audio I/O. We just received the hardware for the new KBRT audio server and Amanda is already at work remotely getting it ready for WheatNet and Nexgen. KBRTôs Nexgen system is a ñno serverò system with the database residing on a drive in the audio server, so to keep from having to mess with the database when we swap out the KBRT ASERV, we moved the database to an empty terabyte drive on the KNSN ASERV. The Wheatstone hardware should be on site in mid-September and Amanda and I are planning to head out there the week of the 28th to do the installation.

Transmitter/Antenna Issues

At one point in late August we had three stations that were at reduced power, off the air or limping along with workarounds. Two of the three issues were the result of lightning hits. The third was another in a string of problems attributable to a safety climb cable.

WDCD(AM) in Albany took a ñgrand malò lightning strike on the antenna sometime on the evening of Saturday, August 15. The main transmitter lit up like a Christmas tree, and the aux transmitter

(which was off and not connected to the antenna at the time) would make RF but not modulate. There was also an issue with the phasor controller ï both the main and auxiliary transmitter interlocks were open. In addition to those major issues there were minor issues with Nexgen (the facility is a collocated studio/transmitter) and the master UPS for the transmitter room.

It took several days to get the aux transmitter fixed. There were several problems with it, but by the middle of the following week our engineers had it running with the phasor interlock bypassed. That at least got the station back on the air, albeit at 10% of licensed power. The main transmitter has a burned out main AC contactor and Nautel does not have stock on a replacement. At present they are searching for something that will work.

WXJC(AM) in Birmingham also took a lightning hit around that same time, and it was phasor controller components that took the worst of the damage. Stephen Poole will provide a full account later in these pages. Stephen and his crew were able to bypass the damaged parts and keep the station operating at the night power and pattern, running around to the towers and manually moving the RF contactors to put the system in the day mode so the station could operate at the full 50 kW during the day. All is fixed now.

Finally, KNSN in San Diego dropped to low power air late in the day on Monday the 16th of August. There was something wrong with the load; both KNSN and KURS, which share the tower with separately-fed skirts, had VSWR issues. A tower crew was brought in the next day and they checked and retensioned the safety-climb cable that has given us issues in the past ï it gets loose and comes into contact with one of the skirt wires. That fixed the issue for KURS, but KNSN could not run more than 200 watts without occasional VSWR trips. Something was arcing. The situation got worse over the next few days until the reflected power was at a steady 80% with only 50 watts forward.

It was not until the following Saturday that the (tower owner) Multicultural engineer looked at the diplexer and found a burned bushing in the prematch roller coil on the KNSN side. He was able to flip the coil around and get it going again, so KNSN returned to full-power operation. We still need to replace that coil and get the safety-climb cable replaced with something non-conductive. This is the third time in the last year that the safety-climb has caused issues with KNSN and KURS.

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

Hello to all from Western New York! It is hard to believe that Labor Day is already upon us, signaling the official end of summer in Western New York. It wonôt be long now until the brisk Canadian breezes will begin to blow down from the Arctic region bringing snow and blustery cold temperatures that we are more accustomed to here in the Northeast. It has been, seemingly, a very short summer.

Although we were not overwhelmed with outdoor projects this year, there just doesnôt seem to be enough time to get everything done on my list before the weather turns for good. Contractor delays, cooler temperatures and extended rainy days have cut back on our outdoor work time considerably.

It was the beginning of August before our mowing contractor could get out to cut the field at the WDCX(AM) transmitter site due to heavy rains in the early summer months. At times, there was at least a half-foot of standing water in the tower field, and with below-average temperatures, it took forever for the water to evaporate so mowing could begin. We generally have the field cut twice yearly, but with the late cutting, I am hoping that a second cut will not be necessary in the fall, saving us several thousand dollars.

Also at the WDCX(AM) site, the contractor has just finished some desperately needed repairs and upgrades at the entrance of our property. We have experienced severe road flooding at the entrance gate to the site, caused

mainly by poor drainage and an undersized drain pipe under the road. Ted Hosmer Landscaping has replaced the drain pipe with a larger diameter pipe and re-landscaped the surrounding area for better water drainage. The roadway at the entrance gate was dug out and filled with compacted gravel, raising the entrance road better than a foot above grade. Also, a new gate was installed, replacing the old gate that was damaged by intruders several years ago. Don Boye is busy replacing the side markers on all six towers with LED side lights, replacing the older incandescent bulbs that seem to go out rather quickly. Don has a couple more towers to do, and that project will be done.

In Buffalo, I am trying to get the WDCZ(AM) tower foundations sealed with Dry-Loc before the weather turns too cold to apply the sealant. We had all 5 towersô foundations resurfaced late last year, and the contractor highly recommended sealing the concrete work to prevent any moisture from entering and loosening up the concrete compound. So far I have two towers completed, but should have enough time before the weather gets too cool to complete the remaining 3 towers.

I would have liked to have the time to paint the exterior of the old WDCX-FM transmitter building this year, but this will have to wait until next year. I painted this building over 10 years ago, and the paint has held up well, but it is beginning to peel and looks unsightly, so a re-paint is in order. This is one item that will have to wait until next year to be addressed.

I am beginning to really dislike Murphy and all his laws! Recently, during a routine maintenance visit at the WDCZ transmitter site, I noticed that some of the metering on the Harris DAX-5 transmitter was missing on the display. After performing some minor troubleshooting, I found that the problem resided on the overlay board, which is a sealed board. Therefore the entire board has to be replaced rather than replacing the bad components. I ordered the replacement board, and shut the transmitter down to perform what should have been a five-minute repair. The overlay board went in just fine, and all of the multi-meter displays were now there, but the transmitter would not come back up!

After spending several hours troubleshooting (this is a new transmitter to me, I have not had the opportunity to work on one, until now), I called technical support for some assistance. To make a long story short, The controller/exciter board had to be replaced. It seems that this board stores several bytes of data written to it every minute, and had filled itself with data. When I shut the transmitter off then turned it back on, all of the programmed operating parameters reverted back to those of a DAX-1 transmitter. Evidently, this was a known problem, and somehow our transmitter did not get the updated controller/exciter board. GatesAir shipped one right out to us under warranty, and the board went in and programmed up without incident.

While on the subject of transmitters, recently I ordered a replacement tube for the WLGZ-FM Continental transmitter in Rochester. I have been requesting EEV tubes when purchasing rebuilt tubes, having found that they are more durable in construction and seem to last a lot longer than most other brands tubes. Anyway, I went to replace the failing tube with the rebuilt tube, and guess what! There was hardly any PA screen current at all. The best I could muster out of this tube was 20 mA, no more.

I believe that when ordering rebuilt tubes, they should send two instead of one, in case one of them doesnôt work. That way, you donôt have to re-install the weak tube you just removed, and wait another week for a replacement to arrive. I am beginning to REALLY like solid-state transmitters ¨ you just donôt have to deal with faulty tubes, sockets, tuning, etc., but that is not to say that solid-state transmitters donôt have their own nuances. Multiple switching power supplies, numerous IPA and PA amplifiers, along with the heat generated by same can be as cumbersome as well.

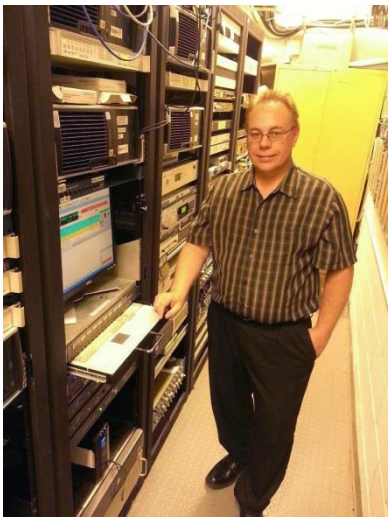
Given my choice, I would rather work on an old tube-type transmitter any day over a solid state. Itôs what I grew up on, and know quite extensively, and my comfort level is quite high while troubleshooting a problem on a tube transmitter. But one thing remains the same: I get a rush out of working on a transmitter, and enjoy it, especially while on the way to troubleshoot the problem. During the ride to the site, I will go over in my mind as to what the problem could be, and the remedy! Sometimes I am dead-on in my mental diagnosis, and other times way off, but this is more thrilling to me than any roller coaster ride could ever be!

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

The Motown Update
By
Brian Kerkan, CBTE, CBNT
Chief Engineer, CBC–Detroit

Lightning Hit

Hello from CBC Detroit! August was a busy month here at the station. We suffered damage from a lightning strike that kept me busy for a few days.



The phone rang at 3:00 AM with a request for my assistance. With times like this, itôs a good idea to work out the ñwhat if?ò scenarios that we often think about.

The lightning strike was a direct hit on the tower adjacent to the studio building. When I arrived, two of the three stations were affected. The WMUZ control surface was completely dead, several audio feeds were down and there was no audio on WRDT.

Thankfully, the WheatNet-IP blade system we are running on survived and was still working 100%. I was able to switch our AM to a direct automation feed, and that allowed me to redirect all of the WMUZ audio through the AM control surface. I had to work quickly since we had a live overnight talk show on WMUZ, and we were able to get it on the air using the WRDT surface. We were able to run morning drive out of this studio as well.

On to the next priority: restoring WRDT audio. I had recently converted the WRDT air chain to AES from the WheatNet-IP blade to the STL. One of the casualties of the lightning strike was the D-to-A converter that was the last link to the STL. I had to find a quick substitute to restore audio, and was able to use an older DAT recorder to serve this purpose until I received a replacement for the damaged unit.

When I had everything back on the air, I started to look at the WMUZ surface. It would not boot. As it turns out, it had a bad CPU board. Since our midday talk show with Bob Dutko was coming up at noon, I decided that after morning drive, I would switch WMUZ into automation direct using the utility mixer in the blade and then switch the CPU out of the WRDT surface. This required me to completely disassemble the board providing access to the card. I changed the SSD drive from the damaged CPU board to the CPU that I used from WRDT. I transplanted the working CPU board into the WMUZ surface. It came up and I was able to switch back to full operation in the WMUZ studio with a half hour to spare before the talk show started. Wheatstone was able to send me a new board overnight, and both surfaces were back in service the following morning.

Throughout the week, I continued to repair issues. Most of what I did to restore service I had thought about in advance. It is a great idea to think through some of the possible scenarios. Over the years I have dealt with bullets, and not transmission line bullets in antennas, burnt up hardline at the top of the tower, bad exciters, bad blower motors, blown tube sockets, and more.

One of the stations I did contract work for didnôt have a backup transmitter. The BE-35T transmitter had a tube socket problem that required parts. Options were limited to restore service. The parts would not arrive for a day, so I started looking around for anything I could use to get a signal back on the air. They did not have an N-to-EIA transition adapter available to connect the exciter to the transmission line, but they did have N-to-N jumper long enough to reach the first hardline connection. They also had a interconnect bullet and a Coke can. I cut one end of the N-to-N jumper off, stripped the end of the cable, wedged the center conductor of the RG-213 cable into the hardline with the bullet, and used the Coke can as a cover, cutting tabs in it and slid it over the bullet. It worked like that for two days. Since the antenna was at 1,000 feet, we did not have many people complain locally, and the show went on.

One of the most rewarding things in this business is when you have to think creativity through a challenge or problem. It is very easy to just spend money, or to just accept that the station will be off the air due to lack of parts. It is always good to have a disaster plan for RF, AF, and studio issues.

LPFM

I have been keeping an eye on the recent request for comments from a group of LPFM

operators. They are looking to change the rules to allow them to sell commercial ads, but something more of a concern relates to the group requesting to change the separation rules. I hope that there will be some common sense here and the FCC will not continue to clutter and make the FM band as bad as the AM band is now.

LPFM is a community non-profit service, and should be run as such. The operation should provide community programming and get sponsorship to continue to operate. These latest moves are nothing more than an attempt to put these stations on the air, and then make them commercial stations.

Revival Detroit

On a non- engineering note, Crawford Broadcasting Company is making a difference in our community here in Detroit. We had a picnic with local Gospel artists this month, inviting neighbors and the community to find out what we are about, and the changes that are being made by Revival Detroit. Revival Detroit is a project that we are involved in restoring homes in the area and cleaning up the neighborhood.

I was called upon to set up sound and to provide assistance with the event. It was a big

Our Revival Detroit block party was a huge success.

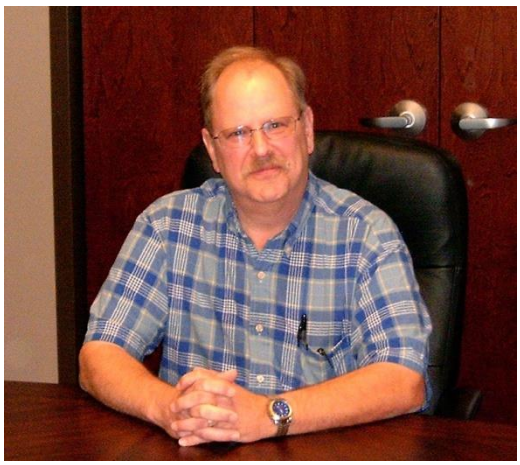
success.

Itôs great to know that not only am I doing what I love doing, I am working for an organization that makes a difference in lives and has a positive influence on many people.

News From The South
By
Stephen Poole, CBRE, AMD
Chief Engineer, CBC–Alabama

Hey, guess what? Iôm going to start this monthôs submission by talking about the weather. I know youôre shocked.

We continue to have one severe storm after another. As I write this, just yesterday, Sandy and I were returning home from shopping, only to discover a tree across the power lines. That entire area was without power and emergency crews had the road blocked. Fortunately, thereôs a back way into our little neighborhood, so we managed to make it home with the ice cream before it turned into soup. (Sandy and I joked about that one: I said, ñWell, be a shame to let all that ice cream melt, so weôd better eat it.ò Iôm glad God gave us of each a sense of humor and I especially thank Him for a wife who shares it!)



Lightning at 850 AM, Tarrant

On Tuesday the 18th, Bob Ratchford, who does a heroic job of keeping an eye on both WXJCs (even when heôs out of the state!), let us know that 850 had refused to go to day mode. Todd ran to Tarrant and started checking things while I was on the way in. He noted that tower #2 wouldnôt switch no matter what he did. The UPS on tower #2, which supplies power to the microwave radio on that tower, had also been damaged.

When I arrived, I started looking for problems. Have you ever had one of those situations that, at first, looks bad, but then turns out to not be a big deal? This was one of those, thank the Lord. In addition to the problem at tower #2, one

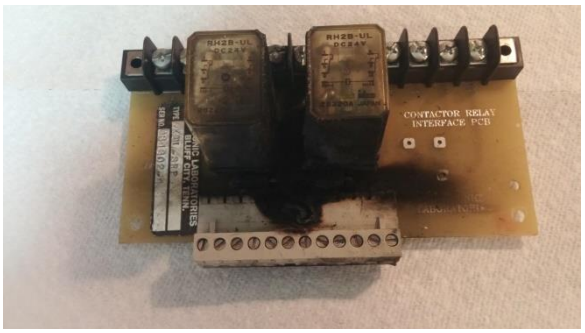


Figure 1 - I guess we took a bite of lightning ...

of the big RF contactors inside the phasor was buzzing and humming whenever we tried to switch patterns.

Todd slogged through the mud to tower #2 while I looked inside the phasor. He called back via radio and said that the slave relay board in the ATU was black and melted (see Figure 1). That gave me a strong clue: I immediately suspected the slave board in the phasor.

Getting to contactor K3 in that phasor is fun (see Figure 2). Itôs surrounded by plumbing, so my task was complicated by the fact that we wanted to stay on air while I did the work. Thank the Lord, Jack and I were able to get the old board out for closer examination without a whole lot of trouble. I discovered that the contacts on one relay had arc-welded themselves into a permanent ñonò condition.

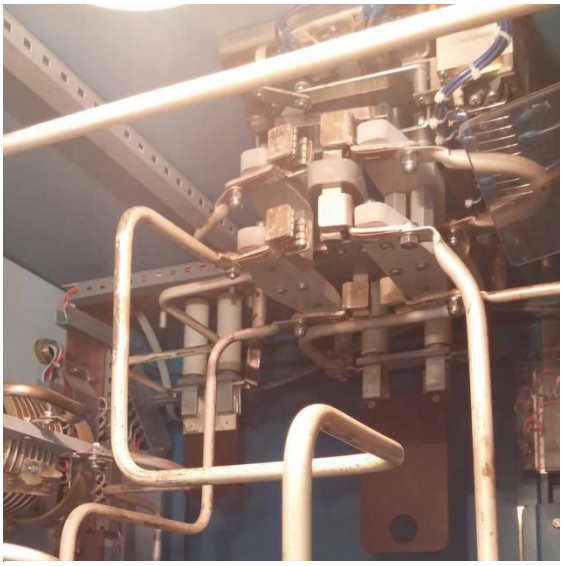


Figure 2 - Getting to the contactor inside the phasor requires ... agility.

Whenever we tried to switch to day mode, both coils on the big contactor would energize, pulling enough current to trip the 30 amp control circuit breaker(!).

We installed the new relay board, pressed the ñDayò button ... and nothing happened. The lights on the phasor controller blinked, but nothing switched. I pulled the new relay board and asked Jack to check the part number at another tower. Sure enough, we had the wrong one: Kintronics had jumpered these to switch with a +24V pulse. Our system uses ground switching. Jim Moser with Kintronics sent me a schematic that I was able to pull up on my smart phone. I changed the jumpers, reinstalled the slave board (this time, I managed to leave a bit of my knuckle on one of the feed lines) and she switched. Thank the Lord!

Lightning At 92.5, Pumpkin Center

A few days after the fun at 850, the Mighty Bob Ratchford let us know that the remote control at 92.5 (WXJC-FM) wasnôt answering. Todd and Jack were busy with stuff at the studios (more on that in a moment), so I ran to Pumpkin Center and checked.

Sure enough, the line fuses were blown. In fact, they were most blowed-up fuses Iôve seen in a while (see Figure 3). Being a skilled and experienced engineer, my visual examination was enough to

Figure 3 - What a thoroughly blowed-up fuse might look like.

condemn them. I didnôt even need a meter. Besides, once I replaced them I had a dial tone, so there you go.

Years ago, we tried various commercial surge suppressors, but with terrible results. They would protect you once, and only once; the very next lightning strike would go right past and eat anything on the phone line. Ergo, I decided to upgrade.

Nowadays, on each of our phone lines coming into a transmitter building, we first have some inductance, usually wound on a toroid. Next in line are two ¼- to ½- amp fuses. These are followed by big, well-rated MOVs to a good ground. Since

installing this rig at our sites, weôve replaced a bunch of fuses and MOVs, but nothing else.

Another Module at 93.7

I related last time that we had replaced two of the modules in the new GV40 transmitter at WDJC-FM. I was a bit discouraged a few weeks ago when the same modules (#7, and then #8) failed again. This time, I told Nautel that we needed to figure out what was causing this.

Terry Crouse with Nautel said that the NV and GV series are essentially just a bunch of 3dB combiners in series. Each PA submodule is combined for the module output; these are then combined in groups, and finally, the groups are combined for output. He said that the way these transmitters are laid out, module #7 is the closest (electrically) to the output flange on the transmitter. Ah.

We have ordered a ¼-wave shorting stub to be put in line and then thoroughly grounded. Back in the day when all transmitters had a big harmonic filter on the RF output, you normally didnôt need to worry about this. The harmonic filter itself would clamp any transients to ground (sometimes sacrificing itself in the process; weôve all seen that a time or two!). But the way the newest, most efficient solid-state transmitters are built, there may not be such a filter on the output.

To Nautelôs credit, they immediately shipped two replacement modules, which we installed. The transmitter instantly returned to full power. Once I receive that shorting stub, Iôm going to stop anything else that we might be doing and get it in line. (Have I mentioned that weôve had a bunch of severe storms here?)

All in all, I still love that transmitter. For one thing, the exciter sounds delicious. Itôs one of the cleanest air sounds Iôve ever heard, especially with the Vorsis AirAura3 driving it directly with AES. But as with any transmitter, I can grumble about a few things.

One is that, if you start losing modules, the output power drops off more rapidly than you might expect. The transmitter monitors the reject loads (see above re: the 3dB combiners), and if any of them are receiving too much power, the transmitter has no choice but to dial it back.

Another problem that we experienced right after installation is that if one rack stops communicating with the controller, the entire transmitter just dies. You are OFF THE AIR. The GV40 has four racks; I would assume that we should be able to stay on the air with at least, say, ¼ power, even accounting for the reject foldback just discussed. Thatôs not the case.

But again, to be fair to Nautel, theyôre bending over backwards to work on a solution to this problem. Theyôve already modified their UPS interface at our request, and have assured us that theyôre going to develop a software upgrade to address this particular annoyance.

All in all, I still think theyôre the best transmitter company in the business. Once we get all of these glitches worked out, I expect that weôll get decades of good service out of our GV40.

Finally: NexGen!

As also related last time, we pulled in an RCS field technician to help solve a truly perplexing issue with WDJC: at random, at approximately weekly intervals, the audio server would hang and require a restart. Todd and I had swapped equipment, cables and even network switch paths; the problem would seem to go away, then return.

The RCS tech, a great guy named Brian, made one recommendation as soon as he looked at our setup: we needed to get rid of the linked switches and use One Big Network Switch. He said that RCS Support was pretty much requiring that now before theyôd do anything else. Cris was on vacation, so I asked Mike Cary for permission to order a 48-port switch. He agreed, it arrived and we installed it.

We also ran new cables to everything in WDJCôs NexGen setup, including new CAT6 into the control room. We eliminated some small switches that we were using to split the network for our Sage ENDECs, too. We wanted everything on that One Big Switch.

Brian had checked WDJCôs database and said that everything looked OK. He left and everything seemed to be holding ... until just this past Friday. WDJCôs control room screen went blank, requiring a reboot. Itôs possible that we jiggled some wires; weôre finally beginning our long-delayed blade upgrade. But weôve already contacted Brian and as soon as he returns from his most recent service call, heôll get with Todd to troubleshoot this one.

And finally, speaking of blades, Jay Tyler with Wheatstone made a quick trip to our facility a few days ago to walk us through setup and configuration. Itôs always good to see Jay; afterward, we enjoyed lunch at Jim ôN Nickôs Barbeque with another local friend, Bob Newberry with iHeart Media. Thanks, Jay.

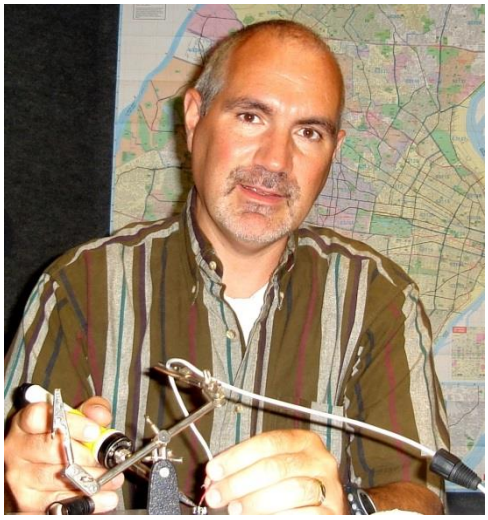
Keep praying for this nation, and keep the family of Dave Hultsman, whom most of you probably know from his time as a Continental representative, in your prayers. You may have heard

by now that he lost his battle with cancer a few days ago. We've lost another good one.

Until next time!

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

While it took longer than we expected, we finished the WheatNet-IP blade system installation early this past month. We had many challenges along the way, which is fine by me. Generally I have found that if you install equipment where it essentially ends up being "plug-n-play," you don't really learn very much. However, if you have a lot of challenges during the installation, you learn a lot more, which means you're considerably more ready to solve problems later on when you have breakdowns that cause you to go off air. That knowledge is invaluable during those times when you're under pressure to get something back on the air.



When I first "cracked" the manual for the WheatNet-IP blade system, I was excited to put into effect some of the silence detection and automatic switching capabilities. Knowing that we could have a control room surface go down but be back on air in less than a minute with our automation system directly on air was something I wanted to build into our new system.

The WheatNet system provides for silence detection and automatic switching in each of the blades we installed. If a source goes silent for a predetermined amount of time at a certain threshold, it will switch to a designated secondary source. Where we would use this is on the blade we call the ASERV blade for each station.

We have the final output to our STL equipment in each of the four ASERV blades. If something happens to the control room surface feed, it will automatically switch to a utility mixer output that contains a mix of all of our automation playout machines outputs. So if the control room feed is down, as long as they have something playing in from automation, they would be back on air in less than a minute.

This is also providing protection for other equipment problems in our air chain. To get our profanity delay and EAS interruption, which are both located in the control rooms, we are looping the audio back through the control room blades before sending it out to the STL equipment. So, this silence detection will protect us against that equipment causing a long off air situation if they would malfunction.

This all sounds great in planning, but it still ends up being trial and error when using it in reality. This was certainly the case here. For three of the stations it wasn't an issue. The setup worked fine for their programming which, for the most part, is music programming originating in our automation system. So if the control room feed would go silent, they would still be on air through the automation playout machine going directly to the STL equipment. Obviously anything "live" would no longer be able to make it on air. But this would mean we could stay on the air while we work the problem with their control room surface.

The problem came with our Gospel station which not only does a lot of live long-form programs but also plays a lot of Bible teaching programs from CDs which are furnished by clients. These often times have very low audio with long pauses. We found out early on that we ended up off air when we had a CD with low audio playing live through the control room surface. We setup the silence detection switching using the default threshold of -40 dB. Yes, the CD audio has long passages with audio below -40dB!

Well, this certainly wasn't something we wanted to create. We wanted the silence detection system to be something that would save us from being off the air, not end up creating it! So, my first reaction was to take the silence detection switching off this station all together since it didn't end up being a very good candidate for the protection with

the amount of low programming they air and not using the automation playout machine to play it.

Then a few weeks later, we had an off-air situation that occurred in the loop back through the control room blade. If weôd had the silence protection switching on, it might have saved us a bit of off air time. It was time to find a compromise.

First, I changed the threshold for the detection to -55 dB and the time frame for the switching to a longer period. I also added the surface program feed into the mix as a secondary source. This way, if the audio switches due to low audio being fed from the control room surface and it isnôt a total failure of the surface feed, it will still stay on the air.

The one danger in this is the potential of flanged audio where the automation playout machine is feeding the STL input directly *and* through the control room surface feed as well, which would likely have a bit of propagation delay as compared to the audio fed directly. However, since we had found most of the very low audio is not coming from automation but rather from CDs played ñliveò through the surface, we shouldnôt run into this scenario very often, if at all.

Automatic fail-safes sound great, but if not well thought out, they can cause more problems than they resolve. If you use them, you need to make sure that every engineer that could be called in to correct problems in the stationôs air chain is well aware of where they are in the air chain and how they function as well as how to determine if they have automatically switched. It can be very confusing to try and analyze why the console is showing audio on its meters but the STL isnôt getting audio, especially if you have some of these potential ñbooby trapsò along the way that they donôt know exists.

The Portland Report

By
John White, CBRE
Chief Engineer, CBC–Portland

Serendipity isnôt a word that is often used in monthly engineering columns. It will be in this column.

A constant and ongoing theme here in Oregon has been the large number of transmission and water towers located near our station. Tower detuning continues to be in the news for KKPZ. The remaining un-detuned tower close to the site is located at the water district compound in the major lobe of our directional pattern. At any point in time, it seems that the detuning of that tower is only six months away. We are now close to the 18th of those 6 months, and we have been forced to file for yet another temporary authority (STA) to operate at variance to licensed parameters.

In recent years, I have gotten to know Jerry, the facilities manager at the local electric utility directly to the south of us. I mentioned that last month, the utility posted a sign indicating the need to notify us when any changes to feed line or antennas were to be made on their communications tower. Other tower owners have not been as cooperative.

Recently I was contacted by Jerry with a request for assistance. It seems that Comcast had called with a complaint that the power neutral and grounds were defective at a neighborhood across town. One of the Comcast workers had experienced a ñshockò when attaching a messenger cable and the situation escalated from there.

The utility carefully checked the neutral and safety grounds and fund nothing broken or defective. The utility crew took measurements and connected the messenger to safety ground using protective gloves. The attached photo shows the readings the safety crew found at the pole. Note this is the standard safety measurement gear used by the utility crews and is intended for line frequency measurements. Accuracy for RF frequencies is questionable.

Given the location near a broadcast transmitter, Jerry contacted me for assistance. He suspected the problem was induced RF energy in the utility facility near the station. Armed with the addresses, I was able to check the FCC database and confirm the location was immediately adjacent to a

local 50 kW AM at the high end of the band. With that information, it became clear the situation was most likely due to RF energy. On site, Jerry pointed out that at least one power drop included a series

A lot of RF voltage on the utility messenger cable!

choke at the power head of the home. That indicated the situation was ongoing.

At that point, the situation was clearly drifting in the direction of RF safety and probably beyond the kind of assistance I could render.

I am reminded of a song by the Coasters, titled ñAnd Then Along Came Jones.ò The premise of the song was that each verse created some kind of situation to be solved followed by the chorus ñé along came Jonesò to solve the problem.

In my case it was ñé then along came Adamò in the form of Adam Carlson from LBA. He was to be in town to check the detuning of a tower near our array and do field measurements for work to be performed in the near future. LBA does work with RF safety and awareness, so the natural solution to the utility problem was to introduce Adam and Jerry. As I said, *serendipity*, as Adam came to town at just the right moment.

The experience does bring up an important point. I have noticed that RF awareness has become an increasing issue for wireless and other tower climbers in particular. That should be a tip for each of us to brush up on RF safety practices.

As summer nears an end, the college sports season is waiting in the wings. KKPZ airs Washington State sports games via Starguide satellite receiver. Recently our receiver failed and refused to respond to mouth to mouth resuscitation. After major surgery I was able to recover a working receiver. The experience reminded me that much of the older satellite gear is likely in a declining state. Locally, the Portland Trailblazers have transitioned from satellite to Internet codecs. Just another reminder that technology marches on.

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

Every year August is a blur. I typically take one week of vacation at the beginning of the month, so that makes the work month three weeks. This year is a little more of a blur as I also had to take some time off and have been busy in my down time with moving into our new home.

Tower Lights

We learned from our friend Derek Jackson that we had a beacon out at the KLTT transmitter site. This was something our tower light monitor didnôt catch. This is the second time weôve had an issue with it not catching a beacon bulb outage. We scheduled Derek to go out and climb for us, and while he was out there we made some more adjustments to our tower light monitor. Hopefully we wonôt have any more issues as this is pretty important. We figured out that the issue was caused by the installation of a boost transformer in the power feed to the towers. This took care of voltage drop issues in the long underground runs to the towers, but we neglected to recalibrate the comparator circuit in the monitor for the new current.

ARCPlus

We finally had one of our Burk Technology ARCPlus units crater. I run AutoPilot 2010 on a computer at the office and I have it regularly pinging each site. If the response isnôt quick enough, it notifies me that the site is no longer

connected. For the most part this works, but every once in a while itôs a false alarm. I received one of these notifications last month for KLZ. I noticed I could not connect to the site and was having no luck with even calling the site on the dial-up.

At first I assumed it was a power failure because the phone wasnôt picking up either. It took me a few minutes to realize that the ISDN did pick up when I put the site on that as a backup just in case it was the link, so the power wasnôt out. I decided to try to access other equipment at the site and had no problem.

I was not where I could run out to the site, so Keith went for me (he lives nearby). He found the ARCPlus dark. He couldnôt get it to come on at all. I put in an email with Burk support that night so theyôd have it first thing in the morning. We determined it was most likely the power supply that was bad. The next morning we went out and tested it and found that it was indeed the power supply.

We needed to get through one more day with no monitoring at the site at least from that ARCPlus. Thankfully, in the IP world most anything is possible. With KLZ, we needed to be able to turn the transmitter off and on and monitor critical parameters to operate legally. There is no day/night switching for that station. We also needed to monitor tower lights. And of course there was the KLVZ night transmitter, which is also at the KLZ site. We needed to be able to turn it on and monitor it.

As a quick workaround, we added the Plus-X IP-8 adapter from KLZ to the KLVZ day ARCPlus unit, essentially remotely controlling the KLZ site with the KLVZ remote control (using channels 17-32). I then had to do a little bit of configuring, but we were off to the races rather easily. We didnôt set up and configure everything, just enough to get us by another day and enough to be legal. This is a good thing to keep in mind if you donôt have a spare but have other stations using the same equipment on the same IP network.

We got the power supply in the next morning, installed it, plugged it in, tested it and everything came up. I was able to connect to the Plus-X IP-8 at KLZ right from the studio and make sure everything worked. I was then able to take it to the site, put the unit back in line and switch it all back to the way it was supposed to be.

Inventory

Itôs that time of year again to begin working on inventory. Keith was able to get quite a bit of it done while I was on vacation, and I hope now I can go back through and find the rest of the items and get it knocked out pretty quick. Thankfully, this year we didnôt do any major cleaning or getting rid of old equipment. The equipment that we did have to get rid of was cataloged well, I believe, and new additions were added as they occurred. We will find out soon enough if I did a good enough job at keeping track of things.

Looking Ahead

September will be a busy month. I will be finishing up with inventory. I need to work on budget stuff for Denver. We will hopefully get our new VOIP phone system finally set up and working (if CenturyLink gets things done). I should also be making a trip out to California to get KBRT set up with new WheatNet-IP system. I have no doubts that the month will fly by and October will be upon us in no time.

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

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

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