The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

Planning

Here at CBC Corporate Engineering, 2015 has started off with a bunch of detailed planning. We have a number of markets that will be installing Wheatstone AOIP systems this year, and that conversion is something that really takes some thought to get it right.

Itøs not just audio/AES inputs, outputs and wiring, either, although that is part of it. There is also network planning to do, and like a lot of other things, there is more than one way to get from point A to point B. Wheatnet-IP uses a dedicated class C gigabit VLAN network.

Option 1: In studios where you have several devices (such as a control surface, mix engine, console blade and Nexgen) you can use a satellite switch and do a single run of CAT6 back to the main switch as a trunk (you can configure ports on both the satellite switch and the main switch as trunk ports). This is what we did in Denver, and it works great. The downside is that it requires the purchase of an additional expensive Cisco smart switch in each studio.

Option 2 is to do home runs of CAT6 for each of the devices in each studio or room and connect them all to the main switch. This certainly keeps the switch count down, and that is an advantage. The disadvantage is that it puts all oneøs eggs in one basket, and requires a lot of CAT6.

Yet another option is a variation on option #2: use a pair of switches trunked together as a main switch. In this arrangement, you can distribute the load according to task. For example, you can put all the audio servers and their corresponding blades on one switch and the control workstations and their blades on the other switch. If you lose one switch or the other, you still have Nexgen *somewhere*, and that should in theory buy you time to troubleshoot and work around the failed switch. Production rooms and other AOIP devices can be distributed between the two switches so that at least some of the production rooms continue to work in the event of a switch failure.

Another strategy in option #2 is to purchase main switches with enough ports to provide for all the needed connections. Worst case, move all the devices on the failed switch to unused ports on the working switch. This is not quite õplug and play,ö however, because control surfaces require a different port configuration than blades and other devices. A sub-strategy might be to go ahead and configure certain ports for surfaces and somehow mark them so that if you do have to move everything over during a failure you can do so quickly without having to connect an RS-232 cable and program ports on the switch.

And yet another strategy, one that I plan to use in Detroit where we occasionally get a õgrand malö lightning strike on the FM tower just outside the studio building, is to purchase and pre-program one additional switch, keeping it in the box on a shelf as a ready but õcoldö spare. Itøs entirely possible that both switches in that facility will be damaged from the H-field resulting from a strike to the tower.

Obviously it is important to have each and every cable and port labelled so that cables can be quickly moved from one switch to another.

After much thought and a day-long meeting with Jay Tyler of Wheatstone, I have come around to prefer option #2, and that means that in our markets where the engineering staffs have already pulled in the single home run of CAT6 to each studio, theyøre going to have to pull in one or three more for control and production rooms, respectively. Iøm sorry for the extra work but I know it will pay off in the long run.

The current plan calls for completing the

Denver AOIP conversion first, hopefully this month. This involves just the control workstations and their associated blades. After that, Detroit. Brian Kerkan is already knee deep in wire pulling and I/O cable manufacturing. We'll move from there to Chicago where cable runs are being installed, then to Birmingham, and we'll wrap up at KBRT.

Another bunch of planning has been going on in Birmingham. We've ordered a new Nautel GV40 transmitter for WDJC-FM. The new rig is scheduled for delivery late this month and we hope to have it on the air in early March. This project also involves a game of "transmitter musical chairs." We're going to pull the Continental aux transmitter (1985-vintage 816R-4) out at WYDE-FM, move the BE FM-30T main from WDJC-FM to WYDE-FM to use as an aux (identical to the WYDE-FM main), and keep the 1987 Continental 816R-4 aux at WDJC-FM. The end result is that we'll have a matched pair of BE FM-30Ts at WYDE-FM (fewer spares required), and WDJC-FM will be in fine shape with a new GV40 as the main and a good-condition Continental as the aux. We're going to need a forklift I think.

Doors

You'd think that if you spent several thousand dollars on a door that it would be durable, right? At the new KBRT site, we did just that. We spent several thousand dollars each on six steel Kevlar-core doors for the tower base walls and the transmitter compound entries. The doors were installed in the fall of 2012.

During my last couple of trips to the site, I have observed some issues with these doors. Back in November, I observed the steel skins of the doors peeling away from the cores. Contract engineer Fred Folmer dealt with that on several of the doors with glue and screws. But as I was doing the sample system recertification last month, I noticed that the door at tower #4 had delaminated, the Kevlar on the outside separating from the hardwood on the inside and the steel skin separating from both the Kevlar and hardwood. Only the deadbolt was holding the panels together. I got the door open but could not get it shut or locked.

During a rather sleepless night spent stewing over the issue and what we might do about it, I had an epiphany: Use a clamp to pull the door back together again, then drill it all the way through and install carriage bolts. So the next morning I got up early, headed to Lowe's, got a clamp and a bag of hardware and headed up to the site.

The clamp did a fine job of pulling the panels and skins all back together (I was worried that

they may be too warped), and with a new drill bit I was able to punch holes through the door all the way around the perimeter. The carriage bolts, flat washers, lock washers and nuts did a great job of

Tower #4 door - before the fix.
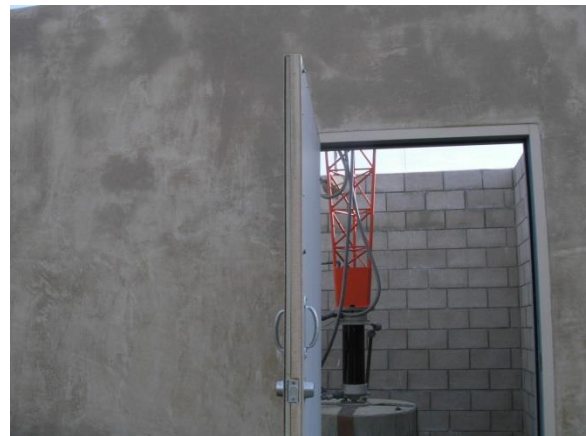
Tower #4 door - after the fix.

making the door once again a cohesive unit. I then drilled around the perimeter and installed #8 stainless steel pan head screws to secure the steel skin to the Kevlar on the outside and hardwood on the inside. The result: a door that is better than new, at least structurally.

I'm still not happy about what happened, and several other doors are starting to do the same thing, so we've got to drill, bolt and screw every door at the site, and we have to glue, drill and screw the edge skins as well. I am trying to contact the door manufacturer to see if there is anything they can do for us. While my fix is permanent and works, we shouldn't have to do this on these very expensive and relatively new doors.

Reminders

As we slide into the middle of the first quarter, be thinking about your quarterly tower light inspections. Are they current and in the file? If not, get them done.

Also be thinking about MoM sample system recertifications. Some stations have those coming due in the next few months. Don¢t wait until the last minute. And remember that those recertification measurements must go in the public file.

Finally, pay attention to the due dates of your annual occupied bandwidth measurements. You are allowed fourteen months between measurements. Be sure those are done and in the file before the due date.

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

Hello to all from Western New York!

Decisions. We as engineers have to make them almost daily. Some require little thought, while others must be made with extensive thought processes, reasoning, and practicality pertaining to the situation. Unfortunately, we as human beings cannot be one hundred percent correct all the time. We are designed to make mistakes but have the capability to learn from them. In doing so, we grow in knowledge and skills which in turn makes us more valuable to our employers.

That is not to say that the one who makes the most mistakes wins! Rather, if you¢re not making mistakes, you¢re in all probability not getting a lot done. Quoting the great Albert Einstein, *"Anyone who has never made a mistake has never tried anything new."*

As engineers, we are looked upon to be capable and able to handle almost any catastrophe that comes along, which in most cases we tackle the situation at hand, most often without much thought process, as we have encountered this many times in the past. But, what do you do when you encounter the unexpected? A situation you have no prior experience in handling? If you¢re like me, a quick study of the problem is performed before any action is taken. What caused it? What can be done to reverse the situation? If I do this, what will be the outcome?

Again, quoting Einstein: *"We can't solve problems by using the same kind of thinking we used when we created them."*

The biggest obstacle I have the displeasure of overcoming is asking for help with a problem I am not familiar with. Sure, there is pride in being able to conquer the problem at hand, but at what cost? Were you off the air for an extended amount of time before you got the problem solved? Did the situation cost the station lost revenue? These are important considerations when you are faced with treading unknown waters.

There is no shame in asking for help when facing a task in which you have no expertise. Who would be the wiser engineer, the one who sought out help with a problem and got it solved in record time, or the one who spent double the time but figured it out for himself? Both in all probability learned from the experience, but at what cost?

Once again, the great Albert Einstein nailed it when he quipped: *"Only the one who does not question is safe from making a mistake. Wisdom is not a product of schooling but of the lifelong attempt to acquire it."*

Many of you have invested years in your profession. Undoubtedly there have been numerous teachers along the way to show you the right way of doing things. Knowledge, somewhat superficial, can be obtained from books, but the ¬hands on¢ approach is by far the ultimate teacher. Each of us has our own strengths and weaknesses, and if we are wise, we are able to recognize each.

The sign of a good quality engineer is in the quest to turn those weaknesses into strong practical knowledge which in turn increases our value to our employer and increases our value to teach others who

are willing to learn from your experience.

When you are faced with making a decision, look at the situation from all angles, and be your own judge as to whether you have the skills and knowledge base to rectify the problem at hand, or seek help from those who have the ability to advise and mentor you. In either case, you are creating a personal worth and value that cannot be bought. Make your decisions wisely.

This past month has been extremely busy in both our Western New York markets. In late December I received a call from an engineer in the Philadelphia market that WDCX(AM) was interfering with their signal. At the earliest opportunity, I went to the WDCX(AM) transmitter site and checked the day/night antenna operating parameters. All readings were within FCC specs. So I assumed that the interference was attributed to an atmospheric anomaly, but to be certain that none of the monitor points were high due to re-radiation, I checked the readings for both patterns and found all within licensed parameters.

Once all the information was gathered, I contacted the engineer of the station and reported my findings. It was not surprising to hear that while I was performing my field measurements, the interference went away and to date has not returned. It was a lot of work in proving that we were operating compliant, but well worth it in comparison to what could happen if we were guilty of interference and did nothing about it. It had been a while since the last monitor points had been measured, so it was worth the time and effort to assure that operations at our Rochester AM were well within licensed parameters.

In last month's report in the *Local Oscillator* I reported on the strong winds we normally get this time of year coming down from the Canadian artic. On the Sunday night prior to New Year's Day we received measured winds (peak gusts) in downtown Buffalo in excess of 72 mph. It was during this windstorm that we lost our STL tower on top of the studio building in the heart of downtown Buffalo. The board operator phoned me just after 5:00 AM on that Monday morning to tell me that our signal was breaking up. A quick tune-in on my bedside radio confirmed the report, so I headed into the studios to switch from digital STL to analog. This did the trick ó we were back on the air with a good audio signal. I attributed the digital breakups to ice forming on the receive dish from the storm the night before.

It was on the way back to the studios that I noticed that our STL tower was lying on its side! A trip up onto the roof found that the 3-inch stainless steel õLö straps that bolt the tower to the non-

penetrating roof mount had literally ripped in two on one side from the winds, causing the tower to tip over. The remaining 4 straps on the other side were completely intact; the aluminum legs were bent and twisted from the weight of the tower tipping. The damage to the tower was substantial. Thankfully, damage to the roof was minimized to a small 3-inch indention to the rubber membrane roof. I along with station manager Brett Larson used several 2-inch ÷come-alongø straps to secure the tower so it would not move and cause additional damage to the roof. The STL antenna was removed from the tower side and temporarily secured to the top of the tower so we could return to digital operation. A replacement antenna mount has been ordered and is ready to go up once the weather gives us a break to get this work done.

Other projects we have completed this past month included the installation of a new Potomac 1901antenna monitor at the WDCZ(AM) transmitter site. The old Potomac AM-19 monitor was at least 25 years old and in dire need of replacement. Readings on the old monitor were noted and compared to readings on the new monitor and submitted to Cris for analysis. I also checked all of the monitor points to insure that each was within limits and submitted the findings to Cris to be submitted to the FCC.

The wiring in this transmitter plant goes back several decades, and most of it has not been documented. For the past month or so, when time allows, I have been trying to come up with a wiring scheme for this site, but the further I dig, the more wrong I find. In order for this site to meet our standards, much of the old wiring needs to be replaced entirely. I am working on creating a step-by-step plan to get this accomplished before the warmer weather arrives, when I will be busy with other outdoor projects that need to be attended to.

One other item to note, we have a serious problem with snowmobile's being operated on our property without permission. Last winter I caught a father/son using our property to teach snowmobile safety to his son. I explained that if something happened to either of them, we could be held responsible although he was trespassing without permission. For the remainder of the winter, I found no more tracks from trespassers. This year, they are back with a vengeance. I am told that there have been numerous snowmobile races on our property as of recent, and an un-named resident near our property has identified the address of the trespassers. The information obtained has been handed over to the Hamburg Police Department to take care of. They have promised to increase patrols around the property

at the times these races have been going on, and also contact the individuals at the address given that they face criminal trespass charges if they don't stop. To date, no damages have been noted, but there is enough snow out in the tower field to deter any walking the towers to perform a visual inspection of all five enclosures.

That about wraps up another month here in the Northeast. 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

It's a new year, and plenty of things are going on here in Detroit. We are in the process of planning, and installing cable for our new Wheatstone production upgrade project. I have started pulling in the CAT6 cable and getting the racks ready for the new Cisco equipment and IP blades. Cris sent me the Kroy wire labeler and I have been putting it to good use making many labels to keep things documented.

While doing all of this planning, I began to think of how much has changed in broadcast engineering since I put my first big studio build together in the 80s. And I was thinking of all of the copper, and distribution cable that can be eliminated with AOIP distribution. One network cable can be used to send all of the audio and control from the rack room and the studio. While this is convenient to use one cable, much thought should go into the overall design for fault tolerance and recovery.

Since all of the audio will be AOIP, there should be an option to fall back on in case of catastrophic failure. A blade failure or switch failure could be a big problem. Having the ability to output analog, or AES directly out of a studio blade to the TX chain is a good idea.

I know of a non-Crawford facility that has a Wheatstone system that was off the air for 45 minutes during the day due to a blade reset that caused a network reconfiguration. They did not have the ability to fall back on an analog or AES backup to the transmitter and had to reset various devices to get back on the air.

I like to think of the "what-if" scenarios, and hopefully think of them before they happen and to be prepared for them when they do. By keeping some of the pairs between studios intact, it provides flexibility to work around many of these types of issues. Worst case scenario is to route analog audio to a processor from somewhere in your plant.
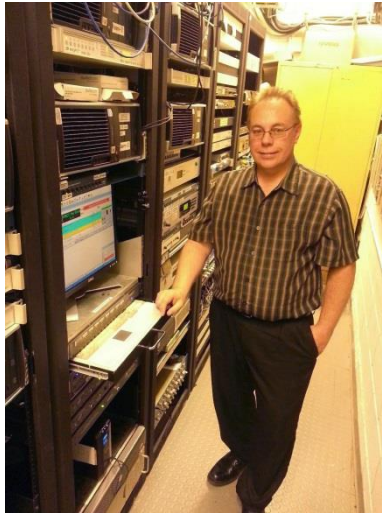
It also seems that there have been a number of malware attacks on automation systems as of late. I notice that about every other month there is a station that has had an incident. Most recently, CryptoLocker has been involved in a number of the infections. CryptoLocker propagates via infected email attachments, and via an existing botnet. CryptoLocker encrypts certain types of files stored on local and mounted network drives using RSA public-key cryptography, with the private key stored only on the malware's control servers, then it displays a message which offers to decrypt the data if a payment is made by a stated deadline. CryptoLocker itself can be removed easily, but files that have been affected are difficult to break.

Even if your facility has a good firewall in place, systems can be infected by a number of ways from inside your facility. One of the ways is through machines that are dual attached to the automation network and the Internet. Machines used by program directors, air staff, and traffic are potential target points, along with portable storage including thumb drives. It is important that these machines have protection on them, and that they be used for business use only. All it takes is someone to use Internet Explorer and surf to an infected page. Some of these new scripts on web pages can infect so fast. The rest of the damage can be done by clicking on a rogue link that looks legitimate.

I try and stress the importance of not clicking on anything that pops up that the user is not familiar with. It may take more of my time to check on these types of things, but the cost of having to

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remove stubborn malware or a virus infection can be far worse in lost productivity and time.

Portable storage should only be used for business reasons, and only used on a machine that is fully protected, and even then it is possible for damage to be done. Any laptops that are used outside the office to develop content for airplay, or are used with the traffic and billing system, or to connect to the automation system, must also be fully protected. Using files off of an unknown website, or using content from unqualified sources can be dangerous no matter what computer is used.

It is also very important to keep an offline backup on a regular basis in case your system does have a problem. The offline backup should have your complete music library, commercials, and production, and should be unattached from the system.

Malware and viruses seek out drive shares to infect. By having an offline backup kept in a secure location, this provides an extra level of protection. Of course, having the correct security on your files and folders will also provide you protection. Most automation systems I have seen have shares that are accessible from any computer that needs access to audio, logs, or schedules.

Last month I did some maintenance of the WMUZ Nautel NV40 main transmitter. I had to replace a defective fan in one of the PA modules, and I found that the new replacement fans run much faster. The new fan runs at 7200 RPM, instead of in the lower 6000s. Our NV40 is serial number 3, so I plan on changing out all of the fans as part of my PM work.

I have been also keeping an eye on transmission line pressure. The cold weather can cause those O rings to shrink. I remember working at a site in North Carolina. They had tanks of nitrogen that were completely empty. It was left that way for months, and the line flashed over at the top of the tower, resulting in a costly repair. I hope to add a remote pressure alarm to these lines as soon as possible, but check the lines on a daily basis since our transmitter is collocated with the studio.

I look forward to 2015 as being a great year with many projects to keep me busy! God Bless!

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

After a few really cold days it has warmed up again into the 50s. I know you folks elsewhere have seen a lot of snow, but aside from a few flurries a couple of weeks ago, we've been free of the white stuff. I've said it before: Alabama ain't wired for cold weather. We had one exceptionally cold night in January – we hit 8 degrees at our home near Hayden, AL – and pipes were frozen all over the place. The plumbers were working overtime.

Several years ago, the temperature dropped down into the low teens. People all over Cullman County cranked their heaters to max, the grid overloaded, we lost power... and the generator at 101.1 FM wouldn't crank. It ran the battery down trying to start. The block heater simply couldn't keep the engine warm enough. Part of our winter preps now include putting a blanket or a tarp over the generator enclosure to keep the cold breeze off of that engine.

Now, you folks in colder areas are probably used to stuff like this. We're wired for 95 degree days at 90% relative humidity. We're used to baking desiccant three times a week in the summer and cleaning mold and mildew off of everything. *That's* Alabama, not 8-degree weather.
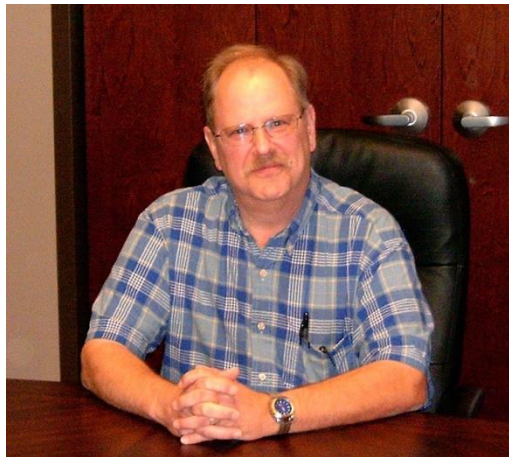
Transmitter Modifications

No, I don't believe in butchering equipment. In fact, if there's any way to avoid the modification, I'll take the alternative. Always sit down and count the cost, then double the amount of time that you think it will probably take. In many cases, you'll conclude that it's not worth trying. Modifying a transmitting system isn't something to be done lightly and we should certainly get Cris's express approval before attempting any such thing.

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That said, anytime you mention this among a group of radio engineers, someone will inevitably ask, "Won't that void the type acceptance?" (Implied: isn't it illegal?) No. In fact, the FCC has *always* made provision for this. [And broadcast transmitters aren't usually type accepted anyway – they're "type notified" – Ed.]

§73.1690 in the Rules spells out precisely what you can and cannot do without FCC approval. Most of it is just common sense. For example, you can't just tack-weld some copper pipes onto your FM antenna to make it "get out mo' louder!" But the key paragraph is this one near the end:

§73.1690(e) Any electrical and mechanical modification to authorized transmitting equipment that is not otherwise restricted by the preceding provisions of this section, may be made without FCC notification or authorization. Equipment performance measurements must be made within ten days after completing the modifications (See § 73.1590). An informal statement, diagram, etc., describing the modification must be retained at the transmitter site for as long as the equipment is in use.

There's some history behind this exception. It even helps explain why we're called ENGINEERS and not "repairmen" or "tech guys." In the early days of radio, you didn't order a transmitter. You *built* it. Even to this day, we routinely come up with unique solutions to unique problems for which *there is no off-the-shelf fix*.

Think about it: every one of the phasing and coupling systems at our directional AMs was designed by Cris Alexander for our company, and every single one is different. There is no "standard phasor." Each must be custom-built. *Engineering.*

I mention this because most recently, someone posted a request on Facebook for opinions and advice. He had an old Harris FM10 transmitter with a tube IPA, and wanted to drive it with a 500W Crown solid-state transmitter. Now, we could certainly question whether it makes sense to do this with a very old transmitter. It's like deciding whether to put a new motor in an old car: is it worth it? In this case, though, the guy already had the Crown and the FM10 and wanted to try it. But sure enough, someone piped up, "you'll void the type acceptance."

No, you won't. Re-read §73.1690(e) above. You must ensure that the transmitter's emissions remain within legal limits, and you must keep a description and drawing of your modification with the transmitter. Having done that, you're golden.

When we bought 850 AM from Hibernia, we inherited a horrible Gates 1KW transmitter for the night pattern. This was the old BC-1G with 807

driver tubes on a PC board, which (sure enough) had already smoked once. (They were notorious for this.) Someone had tried to clean it, but it was still arcing now and then, and wouldn't make over 70% modulation. I went to a local distributor, bought four NTE transistors and built a driver on a perfboard in less than an hour. (I'm not boasting; this was an ultra-simple, rugged design that I'd developed years before.) But I installed it, got the modulation up to 90%... and immediately asked (begged) Cris if we could expedite delivery on the new Nautel 2.5KW that we were scheduled to receive for the rebuild!

Hey, I said some modifications make economic sense. I never said I was *crazy*.

WHAR Is Mah Tower Crew? WHAR??
This is just getting silly. We've been waiting for many *weeks* now for a tower crew to repair our issues at both AMs here in Birmingham. As I mentioned last time, 1260 needs some replacement CAT5 run to the Trango, and we have loose sample lines at 850. But once again, we had a tower crew tell us they would do it... and then never showed. It's disheartening.

The good news is, we do expect a tower guy from Georgia to get to us early this month (February), and I hope to be able to report good news in the next issue of *The Local Oscillator*.

A New Spam Filter
Some years ago, we had a Barracuda Spam Firewall on our mail server. It worked like a champ with our older Scalix software, but when we upgraded to Zimbra, I had a lot of trouble getting it to work. Barracuda was no help; at the time, they only supported Microsoft's server products.

We budgeted this year for a Dell Sonicwall filter. Early in January, Cris told me to go ahead and act on it because we were getting so hammered with spam, all of us were occasionally missing legitimate messages. But when I went to price it, they had changed the licensing terms: it would cost much more than we had budgeted for last September.

Desperation and curiosity make for innovation: I checked with Barracuda, and *hah!* They now support Zimbra. (Proof that we ain't the only people using it nowadays.) I won't bore you with the geeky details, but basically, the spam filter uses LDAP – the Lightweight Directory Access Protocol – to determine if "joe-schmo@wmuz.com" is an actual, legitimate user. Zimbra provides the LDAP server, Barracuda needs to query it. "Is 'joe-schmo' a real user?" Simple and effective. In fact, if a good spam filter gets a bunch of similar emails, some of which

are for non-existent users, it will (correctly) assume that itøs a õspam blastö and block everything from that sender.

The problem is, Zimbra uses a non-standard directory structure. I had figured out a way for Zimbra to talk to our old Barracuda system, but it wasnøt perfect. Sometimes it would miss things and it was making too many errors. But Barracuda has investigated and has provided the needed õquery stringsö to make it work now, so we bought a Barracuda.

So far, so good. Itøs very effective. As I write this, Zimbraøs spam filter is also in line, so weøve got double-filtering. But as Barracuda õlearnsö our patterns and falls into place, weøll eventually disable Zimbraøs filter and just let Barracuda take it all. Itøs a beautiful thing.

Moving the Dish

Speaking of beautiful things, Todd and Jack have taken care of something that should have been done weeks ago. But you know how it is; you get busy, there are higher priorities, and ó you know. I mentioned in a previous issue that we had to move the Dragonwave dish at our studios while the new roof was being done. We mounted it on a big, stiff PVC pipe to keep it well above the heads of the people banginøthe shingles into place.

If you ever have to do this, I have two suggestions. First, make sure you guy the PVC pipe. Itøll flex a bit anyway, but at least the guy wires will keep it from dancing a jig when it gets really windy. (We did this part.) Second, drill a couple of small holes in the mounting bracket and sink some self-tapping screws through the bracket, into the PVC pipe, to keep the dish from turning. (We *didn't* do this one.)

Oh, well. It was really windy one night and the dish honked itself about 45 degrees out of alignment. I found myself on the roof, in the wind and the cold, with a drizzling rain, re-honking that thing back into place. I even managed to slip off the ladder and crack my bohunkus (fortunately, no permanent harm was done to me, or more

Studio Dragonwave antenna in its permanent location.

importantly, to the roof).

While I was massaging my sore bohunkus, I messaged Todd. I said that this would be a high priority henceforth and from that moment forward. And so on. The next day, Todd and Jack did a splendid job of moving the dish from that PVC pipe over to a solid galvanized mast at the back of the building. Yes, there are power lines in the way (no way to avoid them), and we had to clear a bunch of trees as well. The good news is that Todd and Jack not only did a neat job, the signal is stable and everything is beautiful.

Thatøs it for this month. Weøve got some serious busy coming up: a new GV transmitter for WDJC-FM, a new Wheatstone IP Blade system for the studios, a recert for WXJCøs directional system, the aforementioned tower work ó lots of stuff. Until then, and until next time, keep praying for this nation!
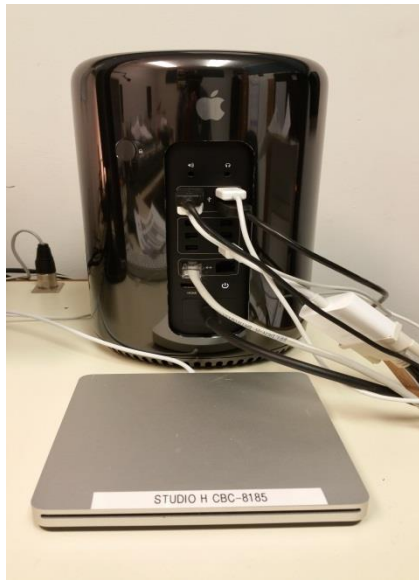
The Chicago Chronicles
By
Rick Sewell, CSRE, CBNT, AMD
Engineering Manager, CBC–Chicago

During the month of January we were busy putting the finishing touches on the last remaining items that were installed in 2014. These included the Apple Mac Pro computers. This has been more of a challenge that I originally thought it would be.
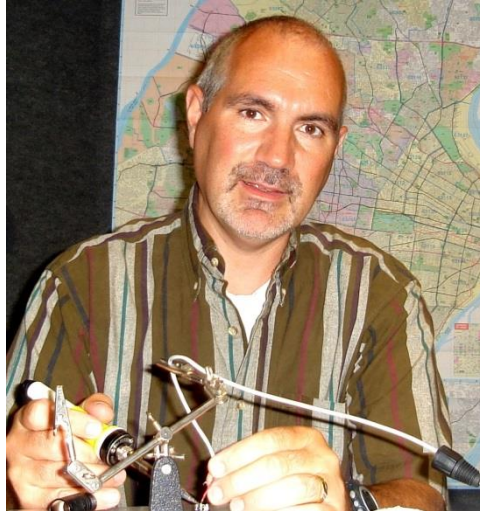
The upgrade of the production room Macs is a demonstration of how quickly things change in the tech world. The Mac Pro/2s we were replacing were 6-year-old computers. This meant a significant amount of change. Of course the operating system, Maverick OSX 10.9, was a jump up from Lion OSX 10.7.

We were hoping to be able to reuse most of the software that we had purchased for the previous Macs, thus keeping the cost down. Of course, and as you probably already have guessed, very little of what we had on the old Macs was transferrable to the new

ones. The one good thing about this upgrade was that we had external USB sound cards on the older Macs and crossing the fingers worked out ó we were able to keep the same sound cards and use them with the new Macs.

If you havenøt seen one of the new Mac Pros, you would soon

An expensive coffee maker!

realize there would be no internal sound card installation on these units. My first comment when pulling them out of the box was, õThese sure are expensive coffee makers.ö So good thing we had USB sound cards already.

The USB ports were another issue. Besides power and Ethernet jack and monitor (HDMI), the computer doesnøt have many provisions for inputs except four USB ports. So with the mouse, keyboard, sound card and external hard drive, we filled them up very quickly. That meant purchasing USB hubs so the producers can use thumb drives. It does have a healthy amount of Firewire ports, so you could convert some of those USB connections to Firewire and free up a USB port or two. So far we have had very good feedback from our production people, especially the ones who had machines that really needed to be replaced.

The other finishing touch was to the mic processors we installed in the fall. I say finishing touch, but in reality our õprocessor guy,ö James Kelly, is never, ever finished with any processorøs settings. He is always tweaking them and never fully satisfied. Which makes him good at what he does.

Frozen Locks

Thereøs nothing as frustrating as having an emergency call to a transmitter site and finding the gate lock frozen. It is even worse with an off air situation. I can remember on more than one occasion holding a lock in my hand in sub-freezing temps using the heat from my hands to get the lock thawed out. I would not recommend that method unless you donøt mind frostbitten fingers.

I have tried a lot of methods, including torches, but always found that if you have a good bit of wind you may have a fight trying to get the torch lit. What I do now is to use the renewable hand warmers.

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A renewable hand warmer is a great way to open frozen locks.

I first discovered one of them in my Christmas stocking one year. I put it in my car so that I had it handy for when I was working outside and needed some heat. Not too long after that I was confronted with a frozen lock at a transmitter site gate. Rather than risking my fingers, the light bulb went off and I got the hand warmer, activated it and put it in my glove with the glove pulled over the lock. I let it do its work for about five minutes and the lock was open without frozen fingers. Since then I have upgraded the operation to using an insulated sock instead of a glove.

Renewable hand warmers have a liquid mix of water and sodium acetate. To activate the warmer you simply snap the metal disc inside the warmer and the liquid begins to turn solid and the resulting chemical reaction puts out heat, anywhere between 120 to 130 degrees. This is warm enough to thaw a lock inside a sock.

The renewal process isn¢t real difficult. You just need to boil the hand warmer for about ten minutes which returns it to its liquid state again and ready for its next frozen lock. It is a lot better than frozen fingers or fumbling around with a torch.

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

Last month we took a history tour of some of the famous days of radio in northwest Oregon. We even discussed sunspots and solar flares, but we skipped moonbeams. On the west coast earthquakes have historically represented THE big emergency event. What can we as broadcasters do to be prepared as an emergency resource for our communities?

Now, 50 years later, broadcasting has changed since that Columbus Day storm challenged broadcasters and more than 65 years since a house knocked over a radio tower. Back then, point-to-point broadcast supplemental communications were DC pair phone lines and õportableö vacuum tube VHF radios powered by dynamotors. Portable ought to be defined as mobile, as in requiring a small truck. Network and nationally distributed programs were transmitted over õequalizedö phone lines of dubious quality. All of those functions have since migrated to other formats.

Network programming migrated from phone lines, to land microwave, to satellite and is now poised to move to digital delivery. Recently a major broadcast service provider announced it will stop providing satellite distribution services. Crawford Broadcasting on the happy end of that cancellation had already moved much of its distribution to Internet codec services.

For non-time-critical programming, national distribution moved from reel tape to CD, then to satellite and now to FTP and other Internet downloads. Local news reporting transitioned from telephone lines to VHF radio, then to cell phones and now Skype and other Internet services.

Meanwhile, those old rotary-dial telephones are translated to digital at the local telco central office. The only resemblance to that phone we once knew is the copper lines out in the street. Beyond the local CO, digitized calls are routed in an interconnected digital network of service providers that serve õtelephone,ö cell and Internet data

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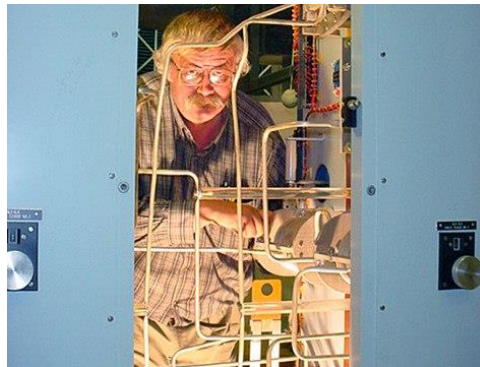
transport.

This complex network provides a complicated and resource-efficient data transmission network, one that is becoming larger, more complex and increasingly susceptible to damage. Earthquakes, storms, solar flares, and terrorist activity are only some of the potential challenges to the Internet and data transport networks.

I promised to address potential solutions to keep local broadcasters on the air providing public safety information. Perhaps it's best to begin with what is not a response to a local emergency.

An adequate response is not satellite radio broadcasting the latest from downtown New York City. An adequate response is not the Internet radio from the City of Angles. An adequate response is not the rumors of Twitter. An adequate response is not õreverse 911,ö for which the intended audience is a tightly-targeted small group of people needing specialized information.

Only local broadcasting can reach a large local audience with vital emergency information.

In that endeavor, it turns out that broadcast television may be somewhat better prepared. Television news long ago migrated from 16mm film to RF-based remote video transport. For the most part those RF resources remain in place today and broadcast TV is not yet single-sourced to the Internet for much of the video transport needs.

For nearly a year now, local broadcast discussion and planning groups have identified several needs and solutions. The first and most critical need is that broadcasters be able to coordinate during a disaster response. No amount of planning can address every conceivable circumstance. Much less effort can be invested in the ability for broadcast engineers to discuss and respond to the conditions as they really happen. By dedicating a VHF or UHF broadcast RPU channel as a coordination net, all broadcasters in the area have an ability to respond to public safety needs.

A second initiative is to provide a shared a VHF or uhf RPU channel dedicated as a õreportersø poolö that allows collection of public safety information. The absolute minimum is an audio channel, and hopefully a video channels can also be available.

Additionally, we are working to provide an inventory of local broadcast capability. Knowing the broadcast capability will help provide a more efficient broadcasting response when that emergency occurs.

Finally, as I write this it occurs to me that as an industry we need to preserve to the greatest extent possible those older RF-based auxiliary resources as we transition the bulk of our activities to modern resources. Crawford intends to keep one active satellite channel which could serve as a method to transmit federal information to local stations during an emergency.

None of us expect the big bad wolf, but when the wolf comes would we want a brick house or a straw house?

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

AMPFET P400

Sometime in December, we noticed the Nautel P400 transmitter at the KLDC transmitter site was on and operating into the dummy load. This is not our main transmitter, but our backup. We normally would leave the auxiliary transmitter õonö but because the interlock is open, it doesnøt actually produce RF. When it is needed, it is a one-button operation to bring it on the air. Somehow the open interlock from the antenna switch was not muting the RF output.

Thankfully no harm was done. We did, however need to spend some time looking at the schematics and trying to figure out what went wrong. This would also allow us to get some meters working and switches working that have been rather dirty. We found the issue with the interlock open not working was a simple relay with shorted contacts ó all of them!. We had to order the part for it and

hopefully that fixes the issue. As for the switches, we sprayed some Deoxit and worked it in and the meters and switches seem to work very well now. We will see how long it lasts, though.

NX50 Module Fail

We had yet another power module fail in our NX50 transmitter out at KLTT. We aren¢t exactly sure why this is happening. I mean, we know why, we just don¢t know why (you know what I mean?). We know what the reason probably is for it happening but we aren¢t sure exactly why it¢s such an issue. The issue is always shorted modulators, and it always happens at night, when the transmitter is operating at low power.

The good thing is we are getting good at troubleshooting the module and repairing it. Nautel sales is getting really used to me calling to order parts regularly to replace what we used.

AM IBOC

We received the AM IBOC exciter for the KLTT auxiliary transmitter back from Nautel after the power failure in December. It would seem that when the UPS died and everything turned off, it somehow corrupted the software in the exgine. At the time we were trying to troubleshoot, we thought this might be the issue, however, we could not remember where the special cable was that is needed to load the software or how to do it. We have since found the cable and will make note to take it to a site anytime we have an issue like this. Maybe with that

power module fixed in the NX50 and the AM IBOC exciter fixed we can take a breather for a little while at 670.

New Tabletop

After years of having a small tabletop for the KLDC talk studio, we¢ve decided it¢s time for an upgrade. Since moving to the new studio space, we have installed two more mics, giving them a total of six. However, because we never got them a bigger table, that makes for a cramped up space.

This bigger tabletop will allow us to actually open the room up a little more, not space-wise, but instead of everything and everyone being cramped in and around the table, there will be room to have things on the table and to have people around it without having to be extremely close. I must say, it is a huge improvement over what we had in there.

Sample System Recertification

It is time again to do the sample system recertification for the KLVZ night facility. This year, I believe we have three stations that will need to be recertified. KLVZ-N is the first one to come due. Next will be the KLTT site and then the KLVZ daytime site. I am not too fond of having to go around and drive the reference field strength points but I¢ll take doing it once every two years rather than more often.

I think that about wraps up Denver¢s month. So until next time í that¢s all folks!!!


Old KLDC talk studio table.

New KLDC talk studio table.

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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BROADCASTING
COMPANY
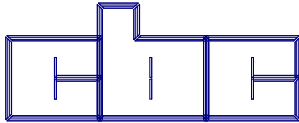
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