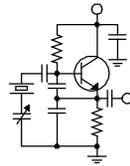


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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KBRT Project Update

As we slide into the month of August, there is a whole lot more going on at the new KBRT site than a bunch of digging. All the tower foundations are in place, and while the concrete cures, the tower crew and general contractor are busy with other things.

All things considered, the project has moved forward with very few issues or problems, although we have had a few to deal with along the way. We found out the hard way that an error in the topographic survey resulted in an error in the design of the site drainage plan, the primary feature of which is a silt dam at the southwest corner of the property.

The drainage for the site, which has considerable slope to a flat area where the transmitter building and towers 3 and 4 will be located, is managed by a pair of concrete V-ditches located a little ways up the slopes on both sides. These drain down to a point of natural drainage, and this drainage leaves the site onto our neighbor's property. Downstream a few hundred feet is a dam that creates a holding pond for our neighbor.

Over the last 17 or so years, with no one maintaining the property, those concrete V-ditches have filled up with sediment to the point that runoff from the slopes above was washing right over the tops and on down the hillsides, eroding the hillsides and picking up sediment along the way. That sediment eventually settled in the neighbor's pond,

reducing its capacity to nearly nothing.

The idea of the silt dam on our site is to give the sediment contained in stormwater runoff an opportunity to settle out behind the dam on our property. The water (less sediment) will then drain via a standpipe. Of course we will have to keep the V-ditches cleaned out and will probably have to periodically dredge the sediment out from behind the silt dam as well to keep all this working properly.

As construction of the silt dam was beginning, we noticed that the dam location as surveyed was not properly positioned across the natural drainage (the overflow line) of the property. We had the surveyors come back out and spot check some elevations and found them to be more than two feet off from the topographic survey that was made in December. We investigated and found that a couple of points in that area were estimated and not measured during that initial survey because of dense brush in the area. That changed the contours of the land in that critical area, resulting in the errors in mapped topography and drainage design.

We really had no choice at that point. We had the surveyors come back out and resurvey that entire area, prepare a new (and correct) topographic survey, and then the civil engineer reworked his plan to relocate the dam, change its elevations and slope, etc. We then had to run that back through the county plan-checker, and it was approved without issue. We are now back on track with the dam construction.



The tower crew prepares the base pier form at tower #2 for concrete

The tower foundation pier drilling went very well. All the foundations are on bedrock and they are quite deep. These will provide excellent footings for the towers.



The rebar cage at tower #4 is in the hole and ready for concrete

Utility construction, our part of it at least, is complete! We have trenched, installed conduits and pull-boxes, and backfilled/compacted nearly a mile for the 12 kV primary power run to the site. The transformer pad is set and the conduit sweeps are installed, and now we are ready for Edison to pull wire and connect everything up. They tell us it will take 30 days! we'll see.

Tower steel will likely start to go up around the 15th of this month. All four "stubs," the bottom sections of each tower up to the first guy level, will be set first. The towers will then be stacked one at a time and should be up in short order.

Between now and then, there is lots of work to do. Guy wire must be cut and assembled with insulators, preforms, fiberglass rods, etc.; tower steel must be delivered and staged; hardware must be prepared and grouped; and wire must be pulled into conduit sections and those conduit/J-box assemblies readied for installation on the towers.

Of course we will have to light the towers as soon as they are topped out, and I had initially planned on having temporary power installed at the site for this purpose. But considering the cost of temporary power, the trouble and expense of running hundreds of feet of temporary wire across the ground to the towers, and the fact that the tower and general contractors otherwise have no need for temporary power at the site, I made the decision to temporarily power the tower lights with solar.

To facilitate that, we purchased a stack of 180-watt, 36-volt solar panels (6PV cells in solar-

speak), four regulator/charge-controllers to convert the 36-volt, 5-amp output of each cell to 14 volts at whatever current is needed to charge a deep-cycle battery. That battery will then power a 400-watt inverter that will provide 120 VAC to the tower light controller.

The tower lights consist of a 40-watt beacon and 21 watts of side marker lamps (3 x 7 watts). The



On July 25, the utility trenching had moved off the road and onto our property

beacon flashes with a 16.7% duty cycle, so its actual power consumption over a given hour is only 6.7 watts. So that makes the power consumption of the tower lights in the neighborhood of 28 watts, which is undoubtedly less than the power loss in the inverter itself. And of course we also have some loss in the tower light controller (photocell, solid-state flasher, etc.).

Whatever the case, a 92 A/H deep-cycle battery has plenty of capacity to supply this load, and a 180-watt solar panel should easily top the battery off every day with even partial sunshine. Still, we'll have a generator on hand to top off the batteries if we get a completely cloudy day.

By the end of this month, I should have a good idea of the remainder of the schedule. We still have to pour the foundation for the transmitter building and the footers and piers for the screening walls. Once the building foundation is in and cured, we can call for the building and have it delivered and set in place. It will come in two halves and be assembled on site. My plan calls for the phasor to be on site when the building is delivered so we can set half the building in place, put the phasor inside, then setting the second half, completing the "ship in a bottle." If we have a transmitter as well by then, we can set it inside while the building is in pieces.

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

Hello to all from Western New York! It has been quite some time since we last visited here in the pages of *The Local Oscillator*. Since I was on vacation the last week of June, I did not have a report ready by the deadline. So this month we can take a look back at the last couple of months' activities here in Western New York.

One of the main topics that seem to be on everyone's mind these days is the weather. It's amazing how different areas of our country are experiencing such drastic changes from normal weather patterns, from flooding in Florida to the drought in the north and Midwestern states, and wildfires in the west coupled with extremely high temperatures. It has been unusually hot here in Western New York, and the heat has been building since late June. On a typical summer day, the temperatures here will average in the low to mid eighties, with low humidity. This year, we have seen a number of days well into the nineties with 70 or more percent humidity readings. The excessive heat has caused some problems with our transmitting equipment, which I will get into later.

I have heard so many people blame the weather changes on global warming. To this I say, hogwash! My argument against this is that weather patterns constantly change. If they didn't, we would have an ice shelf reaching from the North Pole probably through Birmingham by now! I will admit, however, that the ecological weather patterns have been altered by man's influence, such as auto exhaust, bombarding the atmosphere with manufacturing plant waste and altering the landscape by deforestation and unnatural erosion caused by construction of highways and housing developments. With all these factors, the earth has the ability to repair and replenish itself, which it does on a constant basis. We can only hope that man's destruction/alteration of our natural resources doesn't happen faster than the planet's ability to repair itself.



**WDCX-FM – Buffalo, WDCX(AM) / WLGZ-FM
– Rochester**

On Tuesday, June 12th, I had a visit from Doug Olson, the salesman with Thermo Bond

Buildings, who sold us our transmitter shelter a few years ago. Doug was in the area representing Thermo Bond at a telecommunications trade show and wanted to take some time out to see our installation. He stated that he rarely gets to see the finished product, and up until then, had not had the opportunity to see how their buildings were utilized in the radio industry. Doug and I made

the trip out to the Boston hills, and he got a firsthand look at the WDCX-FM transmitter site. He was quite impressed with what he saw, and took a lot of pictures of both the inside and outside of the building. It was good to talk with Doug face to face, as we discussed some problem areas that we have had, and what was done to correct the problem. The only area of main concern was the flashing around the roof/wall area had rusted. This flashing was supposed to be galvanized sheet metal, but rust had almost covered the entire surface of the flashing. To remedy the problem, I scraped as much of the rust off as I could using a wire brush and then followed up with a good coating of Rustoleum aluminum paint. The flashing again looked good as new, and so far, no evidence of continued rusting.

As I mentioned earlier, we have experienced some electrical issues at the WDCX-FM transmitter site which were caused by the extreme heat experienced as of late. On July 17th, with temperatures hovering in the mid nineties, our 200-amp service disconnect overheated on one phase and caused several surges on that phase, producing damage to numerous pieces of equipment. The first to go was one of the protection modules in the surge suppressor. The second surge blew out the composite distribution amp, analog STL receiver, Fostex monitor amp, Day Sequerra HD monitor and Burk

remote control. With the exception of the Excalibur composite DA, I was able to quickly repair all of the damaged equipment and get it back into service immediately. The composite DA took the brunt of the surge, and after close inspection, I determined that a complete rebuild would be in order. As this DA feeds both main and auxiliary transmitters, it was imperative to get this working immediately. A new replacement was ordered from Crouse-Kimzey and put into service. When time allows, I will begin rebuilding the old DA to use as a spare, in case of another failure down the road.

As far as the disconnect was concerned, our electrician closely inspected the switching mechanism inside the enclosure and reported that the entire box would need to be replaced. The heat had caused the blades that connect the power source to the fuse bars to expand, causing arcing, which created more heat, which created more expansion of the clip connector blades. The electrician purchased the same model number disconnect switch, but upon inspection, the box (enclosure) was not the same as the original. If we choose to replace the box with the model he purchased, a major overhaul would be in order as none of the knockouts line up with the conduits now in place. A call into Square D confirmed a manufacturer's change in the disconnect design, but we found also that the insides of the old box are still available and can be special ordered. By just replacing the actual working components inside the disconnect, we will save several thousand dollars in tearing the whole mess out and rewiring with a new 200 amp disconnect.

After a heat lightning storm on June 26th, the remote control at the WDCX(AM) transmitter site would not answer when dialed. Suspecting that the phone line was out, a call was put into Frontier Telephone to generate a trouble ticket to get the line repaired. By the next day, we found that the problem was in fact in the remote control, a Burk VRC-2500. I ordered a replacement speech interface board from Burk and got the unit up and running in short order. As we have a couple of the same remote controls at separate sites, I ordered a spare modem card in case of another failure. According to Burk technical support, this card is the most likely to fail, and at less than \$100, it only makes sense to keep a spare on hand.

While this heat spell was going on, it occurred to me that I have not inspected our Bard air conditioners at the transmitter sites lately. With temperatures close to one hundred degrees, this is no time for the A/C to go out. To insure problem-free operation, I replaced the filters in all our units and

vacuumed out the fresh air intake filter located on the service door of the units. Most folks do not realize that if the filter in the door panel clogs up, it will starve the unit of adequate air intake and eventually drive the head pressure dangerously high on the compressor, causing a failure of the unit. A little housework goes a long way, and keeping the A/C filters clean will help insure that the air will work when you need it!

Another tip is to keep any vegetation clear of the condenser coils on the back of the unit. If not enough air can flow through the coils, the unit will overheat and shut down. And one more thing, don't make the mistake I did and use a weed killer around the condenser coils (at least while the unit is on and the fan operating). Last year while spraying weeds around the A/C units, the fan in the bottom of the air conditioner was drawing the weed killer I was spraying in through the condenser coils. This stuff turned sticky when it landed on the coils, and all of the dirt the fan sucked in from that point forward stuck on the sticky spray, eventually causing the fins around the coils to clog completely, allowing no air to pass through. A high pressure wash with a degreasing agent was the only way to get the coils unclogged. Definitely not worth the additional work to spray the weeds when the unit is running!

A couple of weeks after the remote repair, Earl Schillinger called to report some strange readings on the day pattern. I dialed into the system and found that the daytime parameters were way out, so I shut down the transmitter and switched it into the night array, which looked text book. I suspected that there was a failure at one of the towers in the RF switch that switches between the day/night networks. After putting the array in the day mode, I made the trek out to all of the daytime towers to insure that all had switched. I found the problem at tower #2, which was still in the night position. A call into Kintronics had the parts here overnight, and the next evening, Earl & I shut the station down and pulled the bad RF switch out to replace the burnt solenoid, and while out, cleaned and lubricated all working parts of the switch. I went ahead and replaced both solenoids, therefore giving me a good spare to use in case of an emergency.

One Final Note

One thing we discovered when the power went out at the WDCX-FM transmitter site was that our generator is not big enough to run the entire transmitter plant with the new Nautel NV-40 transmitter. This was the first time we have been on generator power with the new transmitter and the air

conditioning running full blast. The generator would run for about two minutes, cycle down and power back up again. This continued until I got out to the site and determined what was causing the generator to shut down. If I switched off the A/C, the generator would run continuously, so I turned the A/C back on and reduced the output power of the transmitter until the generator quit the weird cycling. After discussing this with Cris, it was determined that the generator was too new to be replaced, so our only alternative is to program a second power level in the NV-40 to be

used in the event of a power failure during hot weather. I will test it again this fall when temperatures are low enough that the A/C will not be on, to make sure that the generator can supply enough amperage to keep our main transmitter on at full power in the event of a loss of commercial power.

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, stay cool, and happy engineering!

The Motown Update

By

**Joseph M. Huk, Jr.,
P.E., CPBE, CBNT**

Chief Engineer, CBC–Detroit

Last month I was looking for a simple way to provide headphone monitoring for my Telos ZipOne codec. After looking on line for some time, I came across a very simple device that works nicely.

Telos originally developed and manufactured the Zephyr IP. The Zephyr IP codec allows broadcast audio quality to be transported across the internet. The Zephyr IP contained a built-in mixer and headphone monitor. The headphone monitor would not only allow you to hear audio from the studio, including the talkback, but local audio from the talent. From experience, not being able to monitor yourself throws off your perception, leading to either under- or over-modulation. Simply put, you as the talent have no idea what you sound like. Over the past year, the Zephyr IP has been discontinued and the Zip One has taken its place.

The Zip One is a very streamlined version of the Zephyr IP. It can accommodate a single stereo line level or microphone level input. In addition, the built in headphone monitor allows the user to only

hear audio from the studio or talkback. It does not have a mix of the local audio input. In past remote

broadcasts, I have used a separate headphone amplifier and mixer to provide the combination of the local audio and studio backfeed. Right now, I am working on a project for our afternoon talk show host, Bob Dutko, who is going to be broadcasting remotely once a week. In an effort to streamline the system, I was looking for a device that could take the place of the mixer and external headphone amplifier. In other words, do we really need the kitchen sink? The ARTcessories MyMonitor, was

just the box to fit the need.

The MyMonitor allows the user to monitor a microphone input and then send a microphone level output to a PA (Public Address) amplifier or, in our case, the Zip One. The built-in headphone amplifier allows you to hear the single microphone input. The audio output of the Zephyr is then fed to the monitor input of the MyMonitor. There are two audio gain controls to give you a customized mix of the local and remote audio.



The MyMonitor can also be battery operated. MyMonitor has also been used in live band applications for monitoring a musician's instrument and composite audio mix. In that situation, portability is essential. The MyMonitor has two headphone monitor outputs.

The best part of this solution is the price tag. The MyMonitor is less than \$100.00. A separate headphone amplifier and mixer could cost three times that amount. Since this solution works nicely, I plan to duplicate the use of the MyMonitor if we have the need to commission another Zip One for one of our clients.

Until next time, be safe, and if all goes well, we will be reporting to you from the pages of *The Local Oscillator* next month. Best regards.



News From The South

By

**Stephen Poole, CBRE, CBNT, AMD
Chief Engineer, CBC–Alabama**

Congratulations to Amanda Alexander on her engagement to Jordon Hopp! I wish her and Jordon a happy and blessed life together. Couldn't have happened to two nicer people.

Dragonwave

We've been using a Trango licensed microwave link from the WDJC-FM site on Red Mountain to the WYDE (AM) site downtown about 7.83 miles as the photon flies. The link itself seems to be holding quite well and we've got one of our new APT Worldcast Horizon NextGen codecs on it. Sounds good.

We've received four other NextGen units and plan to begin installing them everywhere else in the coming months. To make this happen, of course, we'll need high-bandwidth data links to all of our transmitter sites. Most of them are doable, but the jury is still out on 101.1 in Cullman. That's a 45-mile shot, and that might be pushing it a bit. Cris is crunching the numbers now.

The big link, and the first step, will be to replace our current Nanobridge unlicensed link from the studios to Red Mountain with an 18GHz Dragonwave. The Nannerö has done a remarkable job, but being unlicensed, I think we have had interference from time to time. Plus, from reading

about them online, the only complaint I've seen is that they are prone to sudden failures. I guess I can't complain, given that each end (with dish!) only costs about \$75, but we'd rather have something both

licensed and guaranteed.

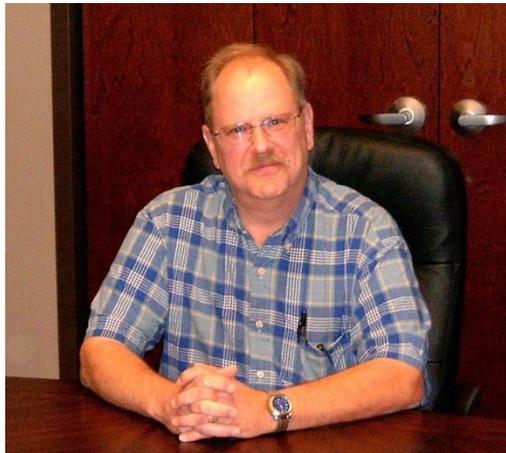
I like the Dragonwave pair that we've received for this link. Even without having installed them yet, I give them points over the Trangos for two reasons. First, the dishes are considerably lighter. Second, you can configure the Dragonwave for single-port operation or i.e., you can do management and data on the same, single CAT5 or fiber cable. That lowers costs and eliminates another point of failure, because you don't need

a network switch or separate rig-up to manage the thing.

We're still getting everything together and we've got to wait for a tower crew, but hopefully, we'll have our Dragonwave link installed by next month and I can give you further first impressions.

Heat and Humidity

Once again, I've managed not to make Alabama's weather the lead story. That took some doing this time, given how hot and humid it has been. I realize that it has been unseasonably hot all over the



country, but trust me: we're hot and humid here at the best of times. With the recent terrible weather nationwide, it has been unbelievable in 'Bama.

To give you an idea, not only has the air conditioning not stopped running for weeks now, the amount of water draining off the coils is astounding. At my house, it looks like a small stream running down the hill in the back yard. Here at the studios, it's almost a constant flow. At our transmitter sites, as soon as we open the doors and some moist air makes it into the building, the wall-mounted units start dripping like mad. I've never seen it so humid.

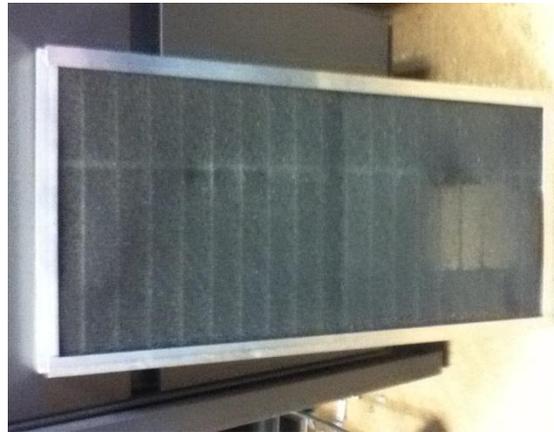
I'm slowly but surely moving into the digital realm on my books and manuals. As part of that project, I bought a Nook (that's Barnes and Noble's e-reader) and love it to death. But the thing is absolutely useless in this humidity. Just riding in the car or sitting in the house for a few minutes is enough to cool the glass screen. As soon as you walk outside, so much moisture condenses that it starts flipping pages and going crazy. I have to switch it off, wipe it off several times, then switch it back on, over and over.

Last month, I discussed the new compressor and dehydrator rig at 101.1 FM in Cullman. I have discovered a kindred spirit: Steve Minshall emailed with some ideas and thoughts after reading that. It seems that he's a fellow tinkerer and 'gitterdone-er.' He had a couple of suggestions that I believe we'll implement on that system. But so far, so good. We're filling a gallon jug with waste moisture about once a week, but that has lightened the load on the desiccant so much, it's still nice and blue. It's a beautiful thing.

More Tinkering

Todd has gotten some mention here (and in *Radio World*) for his various IT-related projects, but it's time to give Jimmy a bit of attention. If you have one of the small BE HD-R transmitters, you know that they use a crazy-weird-sized air filter. You can either order them from BE or buy something at Lowes or HoDe and cut to fit.

After pondering on this for a few hours, Jimmy decided that this wasn't acceptable. He went to Lowes and bought some aluminum U-channel, cut it to make a frame, and inserted a reusable, washable foam filter element. To support the foam, he used a piece of wire shelving, trimmed to fit with a pair of bolt cutters. Gorilla Glue (yep, Gorilla Glue!) was used to hold everything together. Works like a champ.



Jimmy Parker built these filters for our HD-R transmitters

The filters in our wall-mounted air conditioners are way up inside the units. You can't see them, because you have to remove the grills to even get at them. They're easy to overlook, and especially the way the weather has been lately, the last thing we want is a dirty filter. At 1260, I rigged up a frame using some wood strips to mount the filter media over the intake duct, but that took a lot of work.

Once again, Jimmy got creative and got it done. He took some simple aluminum clips and mounted them around the intake grill, and the filter slips in nice and tightly. You can tell at a glance when the filter is getting dirty, too. Changing the media is a snap.

Jimmy has become quite the handy fellow. As I type this, he's headed to the WXJC-FM site in Pumpkin Center to mount a new outside light near the doorway. It's little things like this that not only save the company money, they make things run a little more smoothly. I'm all for it, so a tip of the hat to 'Pelo Loco,' a.k.a Jimmy Parker.

The Firehouse Subs Guy

But in spite of the heat and humidity, it's nice to know that some people are happy. You've no doubt seen the 'sign guys' or the fellows (or gals) who are paid to stand in front of a business, waving a sign at passing motorists. I don't know how effective this actually is, but there sure are a lot of them doing it nowadays.

Most of them have looks on their faces that say, 'what-EV-er.' They hold the sign, occasionally turn in a different direction ... and maybe (if they're feeling especially exuberant) wiggle it a bit. There are a few, though, who take their jobs quite seriously.

The best example here in Birmingham is the Firehouse Subs Guy on Greensprings Avenue, about a half mile from the studios.

This guy has endless energy. He doesn't just dance, he *jumps* up and down. He waves the sign, points to it, then waves his hands in the air. He yells and hollers, then dances some more. He pirouettes like he ought to be in the ballet. He smiles and laughs and shouts. Even with the heat index hovering around 110 degrees, he's out there sweating and dancing and yelling and waving that sign.

I wanted to get a picture of this dude, but he won't stand still long enough. All I get is a blur! I

don't know what Firehouse Subs is paying this fellow, but whatever it is, it's not enough! I only wish I had that much energy.

Pray For This Nation

I'll finish this time with my usual request: remember, this nation needs prayer. While the upcoming election is important, what we really need is heart treatment. This nation has a sick heart and needs to return to the Lord. That's the most important thing.

Until next time!

Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! Things continue to move forward nicely at the new mainland KBRT transmitter site and by next month's *Local Oscillator*, I hope to include pictures of our towers going up. I have been dealing with logistics for the most part, getting all the parts in one place and getting them up the hill as needed. This entire project has continued to amaze me as I realize more and more, what a great team of people God has assembled for us to work with. I can only give Him the glory for this as much of what I witness throughout this project is nothing short of miraculous!

With the island operation now winding down, I continue to move what I can off the island, one boat trip at a time. As with much of what we deal with there, thus far our move has been frustrating as the barge has become very hard to work with. I so appreciate your prayers for this situation as this now



looks like it is going to cost both the company and myself much more than previously thought to barge our belongings over to the mainland.

In the meantime, I have been spending much of my time planning for our long-term operation on the mainland. We still have a few obstacles, but one by one Cris or I have been able to remedy them without much grief. My current issue today is looking into dual-sport motorcycles that might get me up the hill in the

event of a long term rain event. Being that all vehicles must be licensed to use the county road up the hill to our transmitter site, thus far, the street legal (dual-sport) dirt bike seems the best option. I am as always, open to other ideas if you might have any!

Until next month, the Lord bless you and keep you; the Lord make his face shine upon you and be gracious to you; the Lord turn his face toward you and give you peace.

The Chicago Chronicles

By
Art Reis, CPBE, CBNT, AMD
Chief Engineer, CBC–Chicago

Synchronicity, continued

In our last installment, WYCA's new Nautel VS2.5 had suffered damage due to an EMP. That day there were no storms in the area, but the Ethernet inputs to the AUI (main transmitter chassis) and the Exgine (exciter) were both put out of commission. Nautel replaced both the entire Exgine and the interface card to the AUI under warranty, but that resulted in a power output problem. The output came up to no higher than about 870 watts, and took forever to get there. The factory told me that the problem couldn't get fixed without a virtual visit from the factory, which was a problem at the time, since the connection over our LanLink was and is so danged slow. (It has since been replaced.)

The instructions for these adjustments aren't in the troubleshooting manual, so I had to do it with guidance from the factory, one Gary Warner. Gary was great about it. He taught me the procedure, and here it is, in case you need to deal with this problem in your VS rig. Click (ck), in this order:

- Menu (bottom of screen)
- Hardware Configuration
- IBOC Settings
- FM + HD High Injection Gain
- Starting with the value shown on the web page, gradually increase the numeric value in the field while also watching the power output. Click -Set- after each adjustment. When the VS2.5 is thus operating at close to its licensed output, click the -auto find gain- start button. All values will automatically become set for the proper power output.

That procedure thus completed, the little girl came back up to power as neat as you please, but then the HD went bonkers, going on and off with all sorts of red and orange fault lights, which baffled the

factory for a while. Then Nautel CSR Joey Kloss took over, started snooping around, and found.. software incompatibility. The Exgine we'd just



gotten from the factory had the latest software versions installed, but it was mated with the original Exporter, with its older software still inside. You guessed it: the two software versions were seriously fuss-fighting! The Exporter software was now incompatibly out of date. Time for an Exporter software update. Nautel emailed me the software

rather than have me get it off their FTP site, I loaded it into a memory stick, and was going to take it to the transmitter site. Once there, I was to insert the memory stick into the USB connector in the back of the Exporter and perform the update.

There was only one problem: The Nautel engineering folks had never told the CSD that the USB port was not yet set up for that purpose. Joey called me just before I was to leave for the transmitter site to stop me, stating that the memory stick method was not going to work, and that there would be a different procedure for delivery, which would be set up by the next day.

When I went to download the new version, my laptop and the Zimbra mail server wouldn't cooperate. Zimbra figured that I was trying to sneak in some sort of virus through the email system. Both the software and the TFTP system as well had to be downloaded by being sneaky, namely, by changing the file extension from .tgz to .tg. That's a trick everyone should know. Then came the transmitter site trip. The laptop was set up on the transmitter network and the exporter main menu was set up to load and install the software. The software loaded perfectly the first time. For its part, Nautel will be setting up that Exporter USB port as a software upgrade device. That will be so cool. I hope they do that on all their equipment thus equipped.

This entire experience is a good thing in that the procedure was successful this time, but it points up what has to become Rule One in the world of software development: Beware the laws of unintended consequences. If I ruled the world, there

would be a mandatory course required of all would-be software writers on the subject of unintended consequences. This has to be, because the more complex that programming code gets, the more that can happen to cause improper interaction. Here's another example:

In the course of working with the Nautel VS transmitter's AUI, I discovered a good one. If you click on the field in the AUI which indicates the instantaneous power output of the rig (it's the big one at the top), a window comes up which allows the user to change the digital output power of the rig. Whether or not that's supposed to happen at all, I don't know and that's not the point. However, once that window comes up, try getting rid of it by clicking on the "OK" or "Clear" buttons. It won't. You can't get rid of it. You can hide it by clicking on another part of the AUI, but it's still back there. Nautel's CSD has already verified it.

Understand, I'm not telling all this to pick on Nautel. Frankly, this sort of thing happens to *all* the players in this game, no matter who they are. We all have seen examples of software fight problems in all of our equipment. Think of your automation system, for one. Oh, boy. Somewhere, a line of code gets overlooked in a software re-write, and voila! Glitch(es)!

Think of the situation with a software writer who writes code for a process used by multiple OEMs, such as Ibiqity IBOC. It takes months after newly upgraded code is sent to the OEMs before the software boys at the rig makers can beat on both their own code and Ibiqity's, to make it the two sets compatible, and competition between the rig makers makes a deadline for success almost mandatory. That means maybe hundreds of phone calls back and forth between an entity like Ibiqity and the manufacturers. It's always that way. I was somewhat in on such a process back in the 90s when Musicam USA was trying to wed the new MPEG II software to hardware. The phone bills between New Jersey and Germany totaled well over a million bucks by the time that project was put to bed. It's even worse with the operating systems, and the reason why I won't touch any Microsoft OS before at least one year after introduction, or until the first service pack has come out, whichever is later. It's why RCS has kept its NexGen system wed to MS XP, bypassing Vista (good move) and even to this point, Windows 7. And remember, Windows 8 is on the near horizon.

The point is, the more complex the software for any system, the longer it takes to vet it with any other software system that must interface with it. Where's it all going to end? Will this mean a

slowdown in innovation in this area as the vetting process becomes more and more time consuming? Or am I just treading on Larry Foltran's or Stephen Poole's turf a bit much here?? I don't know, but we all who use computerized stuff, be it with the Windows, Linux, Mac or a proprietary operating system, would do well to think about.

Public File Stuff Revisited

Some months ago, in *The Local Oscillator*, I wrote the following: "Lately, the FCC has decreed (dictated?) that, as of a certain date in the future, television stations are *required* to put their public files on the Internet. This has raised something of a hue and cry within the industry, a kind of "How dare they demand that?" response. I've given the issue a good deal of thought, and my response to those who would balk at putting their PF's on line is, "Why not? Why *not* put your public files on line, in PDF form, even? Aren't these, after all, *public* files? The Internet is as public as it gets! Forget what your competition would do with them. They have the means to see your public files anyway. I'd like to hear from anyone who has a real argument against this idea."

Well, I *did* hear from someone with real arguments against the idea. Namely, the Boss; aka, Cris.

In an email exchange following the publication of that article, Cris expressed the whys of his dissent. I won't tell them all, but basically, his tack is that putting your Public File online is a potential invitation to all sorts of problems. For one, you'd better have the quarterly survey of issues in programming in by the 10th. As Cris puts it, "If I were the FCC, I'd be check *everyone's* Public File on the 10th. Violation. And ownership reports. Violations. Down the list."

"And" on letters and e-mails from the public" imagine some troublemaker emailing the station and then waiting for a few days to see if his email showed up in the online file, then calling the FCC to complain when it didn't (for whatever reason)."

"The biggest negative (group of negatives, really) is that your "sins" are on immediate display for all to see." Sins of *omission*, I might add.

As I said, that wasn't all of Cris's comments about PFs online, but it is enough for here. I won't even touch Cris's points on political season problems, because I'm sure you're thinking his same thoughts on that one right now.

As a result, my opinion on website public files has changed somewhat. Last winter I was more

gung-ho about the idea of putting the PF on the Internet, if only to save the staff the chore of having to deal with those folks visiting the station, usually disgruntled, at whatever time suits *their* fancy (remember, the government doesn't like appointments unless *it* makes them. Walk-ins *will* be served).

I now see that there are arguments on both sides. Frankly, in case the FCC forces the issue, and I suspect that this is where things are headed, the best way to make the best of an Internet Public File is to make sure that *one* person is in charge, someone who may be able to delegate the actual chores of putting on and taking off information from the site to a second person, and the first person must be the one *mandating* that the deadlines be met. Twice a week on emails sounds good to me, even if the online response is, "We're working on it." I would say, just to be safe, that where FCC-mandated deadlines are concerned, the *station's* deadline had best be two days *previous*. A key here is to have two people paying attention to the process as part of their daily or weekly do-list, and if that happens, the PF should run like clockwork, even during vacations. It's still a lot of work, though.

You will remember that I ran a story recently about a pen pal from Scotland, Ian Anderson

of Shetland Island Broadcasting. He had some input on this issue as well from a UK perspective. He wrote, "Some years ago the UK regulator Ofcom [equivalent to our FCC] decreed that all public files had to be on a station's website. We are noted for pointing out to Ofcom when they get things wrong (usually over Scottish law which is different, but we get on fine though) and this time it was that while Ofcom wanted it to be mandatory to have a Public File on a station's website, it wasn't mandatory to actually have a website (it still isn't)."

Oh, really??? Well, then, oops! That surely has to beg the question, "What if the FCC was to demand that *every* broadcast station set up a website, if only for the purpose of putting the PF on line? What kind of constitutional questions might *that* raise? Can you say, "Unfunded Mandate?"

Ian goes on: "If anyone complains, we point them towards the website and this usually the last we hear of it." Well, that sounds somewhat hopeful. I'll have to ask Ian about government mandated deadlines the next time we pass the emails back and forth.

Maybe I'm all wrong. But then maybe, just maybe, Big Brother is really out there, and he's using the Internet.

The Portland Report

By
John White, CBRE
Chief Engineer, CBC-Portland

Sometimes it's the little things. In this case I am talking about phone line charges. Another way of asking the question is how does a \$25 a month phone line end up getting billed at \$48? Of course part of the extra costs are taxes. The tax to retire the debt of the Spanish-American War or some such. Taxes are high and going higher, but taxes alone can't cause a near doubling of the line cost. At least not yet.

This is where features step in. Call waiting is an example. This feature and many others like it cost only a few dollars which add up to significant money.

Another example is low minute use lines like security/remote control and satellite dial-up lines. In the case of security, which includes fire protection, two independent reporting paths are required. There is no reason these lines can't be metered use lines at a considerable saving.

The key factor here is knowing the use of the line and being able to correlate use with features. The approach I am using at the moment is to get a complete list of the features for each of our lines. Although it's not as simple as it seems to get that list, once I get it I can then go through each line and add only the needed features for that use.

Security/theft seems to be a never-ending story. We were all pleased to see the story that Cris posted about the arrest of the copper thieves who had taken parts of a new ERI FM antenna from a transmitter site. The value of the loss pushed the theft well into the felony category and law enforcement officers have the perps dead to rights. Mark one up for the good guys.

Then just a few days later I receive this on the local SBE remailer:

Some low-lives broke into the old round green 1080 transmitter building last night. There were not a lot of things worth stealing, since almost everything of use has been moved to the new site next door, but they were after anything of value, especially copper.



The obvious items of value were a small Honda portable generator and a Vertex UHF mobile 2-way radio. For some reason they decided to take a big old Tek scope. However, one of them knew enough to take the two sets of tubes to my Raytheon RA-1000 which I had been storing there. A copy of the manual was in the tube box. One set was wrapped in newspaper, but the other set was new in boxes.

Remember the old math problem where the frog climbs the wall of the well each day and slides back each night? This problem won't be corrected so long as punishment is non-existent.

Last month, range and forest fires were in the news elsewhere in the country. This month it was Oregon's turn. The last few years, the weather has been wet and cooler, ideal range and forest growing weather. The resulting fire fuel loads are high as residents of French Glen Oregon learned this year.

Our broadcast facilities are either located in large grass fields or on mountain tops, all of which can be vulnerable to wild fire situations. Some of the new firefighting technologies can help protect our facilities.

One example is a fire retardant known as FireIce. This product can be used to fight fires or as a defensive product. The product binds water molecules together, making them less resistant to the effects of fire, thus creating a fire barrier and extinguishing the fire faster. While its fire suppressant qualities are vital for firefighters, it can also be used for protecting structures from an advancing fire.

Another product is water-based, intumescent fire-retardant paint. These products go on like any interior or exterior paint. Once in place, they can withstand extreme temperatures for an extended time, over two hours. When exposed to fire, the paint will char leaving a coating of fire resistant foam on the surface of the structure, protecting the structure against fire.

**Rocky Mountain Ramblings
The Denver Report**

by
**Amanda Alexander, CBRE
Chief Engineer, CBC - Denver**

You would think summertime would mean being busy. While my personal life is busy, it seems things around the stations have been somewhat slow. I am not complaining. It's nice to know things are working the way they should for the most part.

We have been having issues at the KLTT transmitter site when storms pass through. Nearly every time, our microwave link goes down and never comes back up. From the studio, we see a good signal and a link lock, but we are unable to pass data through the link.

After making several trips out there the last couple of months to power-cycle the on-tower equipment with the breaker, which seems to be the only way to get the link back up, we still aren't sure exactly what's going on. All we can figure is that something on the tower is failing.

A few months ago I had to order a better network switch for the link at KLZ as we were having issues with it dying up on the tower. I ordered a StarTech IES5100 from Amazon.com after doing a lot of research trying to find a good, heavy duty switch that can tolerate the extreme temperatures it will experience on the tower. I ordered and received another of these and installed it at KLTT. It held solid for about a week until some storms came through. Obviously the switch was not the issue.

It was at this point I decided to replace the D-Link switch in the building. That unit has been in there since before I came to Crawford Broadcasting (ten years). The unit has been a good one, and D-Link still makes the 1024 model, so I bought another one and took it out and installed it. After doing this, everything did great through two storm events. But on that third storm, the link went down again. Evidently that wasn't the issue, either.

While swapping out that on-tower Ethernet switch, our tower climber/engineer, Derek Jackson, noticed the 120-volt power cable going up the tower had definite UV damage. We aren't sure if this could be the culprit or if it is the NanoBridge link to the

building or even the Trango microwave radio itself. But that power cable is definitely in bad shape. It's possible that nearby lightning strikes are producing arcs from one or more of the conductors to the tower. The next step, then, is to replace that power cable,

then wait and see if that solves our problem. Otherwise, we will replace the NanoBridge units. If this does not solve our problem, the only other thing we know to do is pull the Trango radio on the tower and ship it off for repair. That would be super expensive and would leave us with only an ISDN connection to the studio for the month it would probably take to get it repaired and

returned. If we can avoid that, we will.

KLDC also has problems during storms. Anytime there is a storm over Denver, it takes the main transmitter down. We attempted to widen the spark gap, but that has done nothing. For whatever reason, after three VSWR events, that ND-1 will trip completely off after about three VSWR events and it requires an off-on command to reset it. The ND-2.5 at KLVZ turns itself back on after VSWR events. Why the ND-1, which is essentially the same transmitter, can't work that way I don't understand.

I have found that the aux transmitter we have out there, a Nautel P400, actually does well during storms. As I write this, I have had an idea perhaps I should write a script in AutoPilot to check the site every few minutes and if it notices the power down below x amps, switch to the aux.

The problem with KLDC, is the station does not have sufficient staffing for people to monitor it. With the changes taking place on the station, we currently do not have a full-time local employee I can rely on to troubleshoot when issues arise, so this ends up falling on me to deal with and let's face it, I do have a life. It is difficult at times because I do go out and do things when I'm not at work, and it makes it harder for me to monitor the station. I'll work on that script and let you all know how it goes in next month's column.

With the same issues plaguing me for most



of the month, it is what makes the month seem to go so slow. I'd keep pressing on trying to diagnose what is causing certain issues and hopefully I'd have

something better to report for next month.
So until next time! that's all folks!!!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

July... International Malware Month?

Unlike National Soy Month or National Garden Month, I don't believe there's an official month dedicated to reflecting on the nuisance of malware, but apparently July was a big month for those who find enjoyment in wreaking havoc on the computer world. During the month of July, I had about six different computers in my care for a variety of infections. The number of affected computers is unique in itself, but the types of infections also made me take note. Half were the generic Trojans and data miners that float around the web on a regular basis. The other three were devious little infections that rose to the level of making it personal. I thought I'd provide a brief narrative of each experience in case someone finds themselves in the same situation.

I regularly browse through several different user forums devoted to reporting, tracking, and removing computer infections. Hardly page turning or scrolling or material, but necessary reading these days nonetheless. Whenever there is a major surge of one type of infection or another, the forums are typically on the front lines of reporting and tracking. In this specific case, it was the Sirefef infection and instances were appearing all over the radar.

Based on the information I discovered during my research, Sirefef was first noticed in April and utilizes a variety of tricks to keep itself hidden including disabling the security features or software on the infected computer. There are several variants of this threat and all of them are considered severe. Some users have reported that the infected computers would simply reboot after 15 seconds and with others, the OS wouldn't even boot up. Thankfully the system I was working on had NOD32 by ESET as the

resident anti-virus software, which Sirefef was unable to disable. In fact, NOD32 seemed to be preventing the infection from running whatever script it was trying to run which I suppose could have been a reboot command.

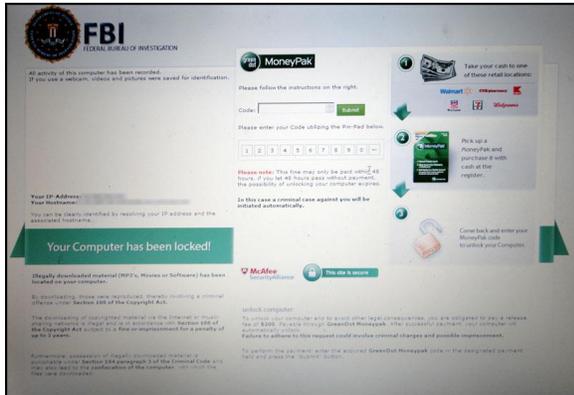
The reoccurring theme with Sirefef is that it dives into the system files and replaces the legitimate file with itself. I needed to find out where it was hiding, so I scanned the Windows registry, services, drivers, and other important bits of data. After looking through

various exported log reports, I found several possible infection points. Using that information, I was able to repair or remove the files as necessary and move on to the next step.

I have a variety of tools in my arsenal that I use for malware infections. For the truly nasty ones, I turn to a free application called ComboFix. Quite honestly, I have a love/hate relationship with this program. At times, it does the trick and removes the infection with no problem. On some occasions, something occurs during the removal process which causes more problems than before I began, leaving a clean install as the easiest option. This time, ComboFix was successful in removing some of the infections.

Following ComboFix, I turned to the installed version of NOD32 for the next scan. Unfortunately, something was still preventing it from running a complete scan. I discovered some time ago that even if an infection either prevents or limits the installed anti-virus software's ability to scan the computer, an online scan will rarely be hindered. A complete scan using ESET's online scanner removed another series of infections from the computer.





Ransomware screen demanding payment to unlock the computer

As the computer rebooted, I could immediately see an improvement in the performance. Another positive sign was that the installed anti-virus was able to complete the full scan of the entire computer and came up completely clean. After a series of other scans with clean results throughout, I felt confident enough to give this computer a clean bill of health.

The other infection I encountered on a separate machine was one that I had heard and read about, but had never actually seen. Commonly referred to as Ransomware, this type of infection essentially locks down the infected computer and demands that a fine be paid to regain use of the computer. In some cases, the computer is actually unlocked after submitting the necessary amount. Other users aren't as lucky.

Based on recent reports, Ransomware has been on the rise globally during 2012. The approach varies, but the theme is common. An intimidating warning demanding a specified amount of money that refuses to disappear even after a reboot. The specific infection I encountered is known as the FBI MoneyPak ransomware and in recent months has been spreading throughout North America. The warning claims that the infected computer has been

used for illegal activity, sometimes specified as downloading music or viewing child pornography. The user then has 72 hours to pay a fine of \$100 or \$200 for the computer to be unlocked. In some unique cases, the fine is listed at \$100,000, which could obviously send a panicked user over the edge. If the fine remains unpaid, the fake message states that the computer's user could face jail time.

As I mentioned earlier, rebooting the computer is useless because the warning returns as soon as it boots back up. Bringing up the Task Manager also doesn't work. I decided to first try restoring the computer to a recent restore point. Doing so doesn't always work with infections, but it was certainly worth a try. Because I couldn't use the GUI to reach the restore function, I was forced to launch it within the command prompt (`c:\windows\system32\rstrui.exe`). I booted the computer in SafeMode with a Command Prompt, but the window would freeze mid-way through typing the command for the restore panel. After several similar attempts, I discovered that I only had two to three seconds to type the command before the window would freeze. Once I was able to successfully launch the panel within the three-second time frame, the restore process began.

After a test in patience, the computer's restored state booted up. I was very pleased that the false FBI warning was no longer on the screen. I quickly followed up with a series of scans and infection removals using a variety of different applications.

The developers of these varied infections are becoming extremely talented and their wares are considerably more sophisticated than what we've seen in the past. The key is to stay informed and share the information. Whether simply by pushing specific advertisement or by selling user data, malware authors have found ways to make money from these nuisances. Apparently, they have now opted for a straight-forward approach.

í until next month!

The Local Oscillator
August 2012

KBRT • Avalon - Los Angeles, CA
740 kHz, 10 kW-D, DA

KCBC • Manteca - San Francisco, CA
770 kHz, 50 kW-D/1 kW-N, DA-1

KJSL • St. Louis, MO
630 kHz, 5 kW-U, 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

KSTL • St. Louis, MO
690 kHz, 1 kW-D/18 W-N, ND

WDCX • Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2

WDCX • Buffalo, NY
99.5 MHz, 110 kW/195m AAT

WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT

WEXL • Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D

WLGZ-FM • Webster - Rochester, NY
102.7 MHz, 6 kW/100m AAT

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

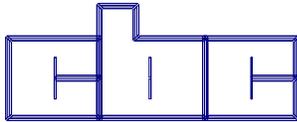
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND

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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