The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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2012 in Review

Without a doubt, this last year was one of the busiest in my career. As I began to think through why 2012 was such an active year, I was surprised at the relatively small number of projects that we undertook. Not so surprisingly was that it was the KBRT Oak Flat project that filled the calendar. More on that later.

We did, however, work on a few other projects worth noting. One, which has been very significant to our company financially, is MDCL (modulation dependent carrier level) operation. Since late 2011 we have implemented MDCL on all our 50 kW AM stations and a couple of our 5 kW AMs as well. Itôs on the big 50s that we see the best results ï generally $1,000 per month or so in savings (compared to the same non-MDCL month in the previous year). Thatôs significant, and multiplied by our several high-power AM stations, it really adds up, month after month. To date I have not received a single complaint or report of diminished coverage or sound quality, analog or digital, as a result of MDCL. I look forward to implementing the technology on KBRT when we fire up the new 50 kW facility next month.

Another project, which impacted every station in the company, was the change to a different space-segment provider for our Ku-band satellite network. We had to rotate the polarization of every RO antenna and the three uplinks as well. That all went very well, and we lost no programming as a result of the carefully timed change.

In Detroit, we experienced a burnout in the main transmission line for WMUZ, the first ever since that line and antenna were installed in 1985. The full-power identical backup antenna and line served us well during the outage.

In Birmingham, Chicago and Southern California we added licensed broadband 11 and 18 GHz microwave links, continuing the migration away from traditional 950 MHz aural STL links and unlicensed ñpiggybackò data links. With the exception of one failure about a week after installation in Birmingham, these links have been very reliable. We have two additional microwave links in process right now, one in Birmingham and one in Chicago, waiting on tower crews or weather for commissioning.

I learned a new skill last year ï working with fiber optic cable, installing connectors and using fiber in microwave and network applications. With the whole world converting to fiber, Iôm probably way behind the curve, but at my age I was pretty tickled to figure out how to do this. It is definitely a technology we intend to use in specific applications going forward.

We replaced the WDCX-FM 10-bay antenna in 2012, and we also installed a new Nautel NV-40 main transmitter there.

And we added a station to our group just this last month: WDCZ(AM) in Buffalo. This station, formerly WNED(AM), operates on 970 kHz with 5 kW full-time using a five-tower in-line directional array. The equipment is all fairly good and is in good condition. We signed the station on at midnight on January 1. It will simulcast WDCX-FM and provide fill-in service to several key areas in Canada where WDCX-FM has lost coverage as a result of interference from new Canadian stations in recent years.

Now, back to the KBRT Oak Flat project. I donôt intend to chronicle the project in detail in these pages, at least not yet, but an overview is a good reminder of how far weôve come in the past twelve months.

At the beginning of 2012, we had assembled a team of engineers, consultants and specialists to produce all the various plans for the project. These included architect/engineer Ray Grage, who designed all the structures (other than the towers); structural

engineer Larry Paxton (tower designer); civil engineer John Deykes (grading and hydrology); environmental specialist Kevin Shannon; surveyor Ramon Gonzalez; and geotechnical engineers David Albus and Patrick Keefe. We got these plans all filed with the county with permit applications, knowing very little of what we were in for with Orange County Public Works and the O.C. Building Department.

The next months were spent revising and re-revising plans to suit the whims of one contract plan checker at the county, who has us in the ñpermanent spin cycleò requiring review after review, each with a substantial fee attached. It was only after I went over this plan checkerôs head, at great risk to our project, that we got the building official involved and some sanity restored to the project. It was the middle of June before we got permits issued, permits for a plan set that bore little resemblance to our original vision for the project. Thankfully, shortly thereafter, the contract plan checker that had caused us so much trouble and cost us so much in terms of money and time was let go. We were then able to revise the structural plans back to the original design, which saved us a fortune in construction costs.

Starting in May, general contractor extraordinaire Shanan Brown was on site, trenching for the primary power feed to the site. That trenching was completed at about the time the grading work at the site began.

There were starts, stops and revisions with the grading, thanks mostly to a county grading inspector who perhaps used standards that were not applicable to our project, but we got through that. Piers were drilled, foundations were installed, the building was set in place, towers were constructed and security/screening walls went up in the following months. Once the building was in place, transmission lines were installed, antenna tuning units were set in place and connected, equipment was installed in the transmitter building and the first RF was radiated from the site in mid-December.

And that brings us to right now. All is done except the ground system, and as I write this the crew from P&R Tower is wrapping that up. The system has several road crossings, two concrete V-ditch crossings and a lot of steep terrain. The ñeasyò part of the ground system was installed first, allowing the general contractor to wrap up by installing a gravel road through the lower part of the site. Wet weather has kept the folks from P&R on anything but a steady schedule since the early part of last month, but with excellent site conditions and a great forecast for this week (12/31), they should have no trouble wrapping up.

Amanda and I plan to be on site the week of January 7, measuring the base impedance matrix, calibrating the model and deriving the operating parameters. We will then have to make some changes to the ATU networks and will hopefully have the pattern adjusted within a couple of days. The site will then be brought up at full power for a day or two while Bill Agresta and others make the FCC-required reference field strength measurements for the moment-method proof. Once those are done, I will complete the FCC paperwork, get it filed and then we wait for program test authority (PTA).

At this point, we plan to be on the air from the new site in early or mid-February. This depends, of course, on our having no issues getting the measurements done and the phasing and coupling system adjusted, and of course it also depends on a timely grant of PTA by the FCC. Mr. Crawford and I plan to be on hand for the big event, with the boss pushing the button himself. He and I then plan to spend a couple of hours on the air that same afternoon discussing the project, all we went through to get it done and how God provided all the right people and orchestrated events to make it happen. I canôt wait!

Another thing that bears mentioning is the video surveillance and security system at the site. It is amazing. We have eight cameras (some of which are located at the towers) covering all the towers, the entry gate, the building and other key areas of the site

This array of fixed and steerable cameras covers most of the site.

plus a PTZ (pan-tilt-zoom) camera that we can steer to just about any point on the property. These cameras are color day and IR night, and we have lit the site with powerful infrared illuminators so that the cameras can see in the dark.

The alarm system includes the usual door

contacts and motion detectors, but it also has photo-beams all over the place including inside the building and tower security/screening walls, plus long-range Doppler motion detectors and other measures that cover most all the property. All this is monitored at a central station, and when an alarm is detected, the officer monitoring the site can look at all the cameras and decide if the alarm is real or false, then dispatch armed security guards to respond. The armed service also makes random patrols of the site. We have made the site as secure as we can, and thankfully we have had no further incidents of vandalism.

The camera array provides surprisingly good IR night images of the Oak Flat site.

Finally, webmaster Larry Foltran has produced an excellent website that chronicles the construction of the site. You can view it at http://www.crawfordbroadcasting.com/oakflat_gallery/. We will add to this website as we wrap up construction and as the site becomes operational.

As I look back over the past year with this project, I cannot discount the spiritual element. Godôs hand is evident throughout this project. As I mentioned above, He provided us with the right people, folks like Michael Sheldon who got us through the use permit process, folks like neighbor and friend Larry Boothe, folks like each member of Team Oak Flat that I named above. He even provided us with perfect weather throughout most of the project and kept things safe so that we had no theft or vandalism to speak of. God is indeed faithful. I hate to think where we would be with the project today without His provision and help.

A Peek Ahead

The year ahead looks like it will be very light in terms of engineering projects. Because we donôt have a lot budgeted for capital projects in 2013, it should be a good opportunity to catch our collective breath and get caught up on things that have perhaps been deferred during the pressing projects of 2012. Of course we may have some surprises to deal with (as we always seem to), but at least those wonôt be intermixed with big projects.

One of the things on the calendar for 2013 is vacating the KBRT transmitter site on Catalina Island. While I look forward to being *gone* from the island, I donôt look forward to all that will be involved with *leaving*. We have to bring the Nautel XL-12 transmitter from the island to the new site (for use as an aux), and we have to transport the generator to the new site as well. Besides that, we have a lot of ñstuffò to move or dispose of, 60+ years of accumulated equipment, hardware and what amounts to junk. We still donôt know if weôll have to take the towers down or not. The good news is that we have until the end of the year to clear out, but thereôs no way I want to drag it out that long.

Elsewhere, we have a few projects on the calendar. In Buffalo we will rework the road into the WDCX-FM transmitter site. We have tower painting to do in several markets. In Denver, we will replace all the remote control systems and the IP audio transports to each of the tower sites. We have a parking lot project to do in Detroit and some fence work to do at KCBC. Thatôs about it. I am looking forward to a good bit of time in the office and some trips to markets I havenôt visited in quite some time.

It is my sincere hope that 2013 is a great year for each of you. Make the best of it, and honor God in all you do.

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

Hello to all from Western New York! Well, another year has come and gone, and as each year passes I am amazed at how fast time goes these days. Each year seems to go progressively faster, and before you know it, another new year has begun!

Looking back over 2012, I can honestly say that it was a very good year for us here in Buffalo and Rochester. We were blessed with a new Nautel NV-40 transmitter and 10-bay ERI antenna for WDCX, items that were sorely needed to bring our facility up to todayôs standards. In Rochester, we did not have any major cap-ex purchases, but our operating costs were kept at a minimum due to no major equipment breakdowns and minimal needs for site improvements.

This year will mark another milestone for CBC in Western New York, as we recently purchased WNED from NY State Public Broadcasting. WDCZ 970 went on the air at midnight, January 1st, simulcasting programming with WDCX-FM. Most of you are aware as to the reason we purchased this AM station, and it, no doubt, will serve the Toronto and outlying areas well. I canôt wait to hear some reception reports as our staff travel throughout the greater Toronto area in the next few months.

One of the duties I had to oversee to get WDCZ ready for ón airô was to have the STL transmitter dish moved from WNEDôs tower to our studio rooftop in downtown Buffalo. We were told that this dish was a 6-foot grid, and preparations were made assuming that the information we received was correct. When Don Boye of Western Tower Service went to remove the STL dish, he discovered that it was an 8-foot grid, not a 6-foot dish, as was listed in our inventory. This presented a problem to Don, as he did not have any equipment large enough to transport the dish to our facility.

After receiving this news, I contacted my friends at American Household Moving & Storage, a company I have worked with for many years, to move the dish to downtown Buffalo and hoist it up onto the roof of our studios. Once the dish was up on the roof, we busied ourselves to get the pole mount ready for Don to install the dish. The remainder of the installation went problem-free and we now have a good STL path from downtown Buffalo to the WDCZ transmitter site located south of the city in Hamburg, NY, which is a little less than 10 miles as the crow flies. I suspect though, before spring comes, we will need to raise the receive antenna, as it now points just at the top of the tree-line across the road from the transmitter site. When spring arrives and the leaves start coming out on the trees, we may have some reception issues with the additional foliage, so raising the dish several feet should not be a problem.

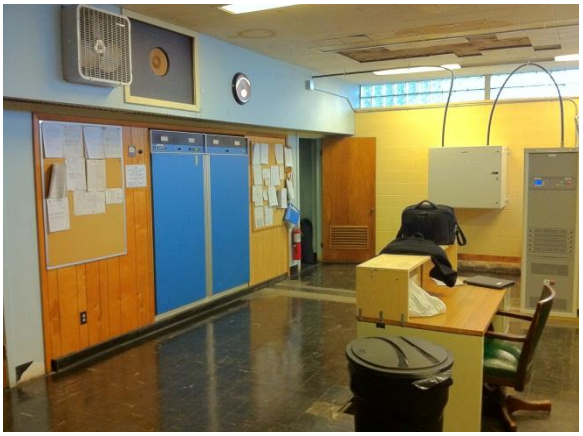
Right before Christmas, I went to adjust the audio processing for the new AM station, and wanted to take a listen to it on air. I pressed the plate on button on the Harris DAX-5 transmitter, and nothing! The transmitter would not come up and make RF. There were numerous faults showing, and all pointed to a supply problem within the transmitter. There are two switching supplies that provide operating and control voltages to the transmitter, and I found that the 48 VDC supply had failed. This was due to the cooling fan locking up and the supply shutting down due to thermal overload. I found several new spare switching supplies and replaced both the 48 and 12 VDC supplies. After doing so, the transmitter came up and we were able to adjust the audio processing to our liking.

I have included some pictures in this monthôs report of our new facility. Enjoy!

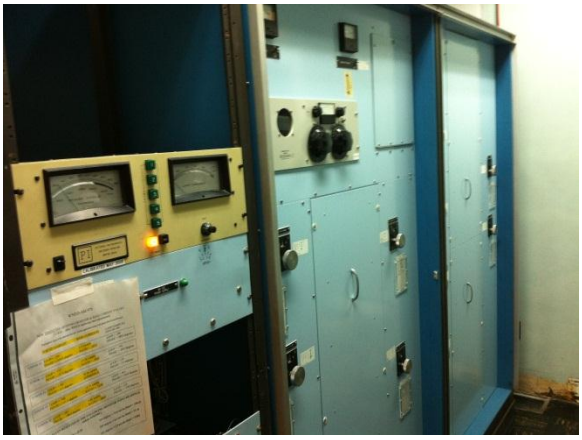
That about wraps up another month here in the great northeast, and until we meet again here in the pages of *The Local Oscillator*, be well, stay warm, and happy engineering!

WDCZ Transmitter Room

Main Transmitter and Equipment Racks



Aux Transmitter (MW-5)



WDCZ Phasor

WDCZ Antenna Field

Roof-Mounted STL Antenna

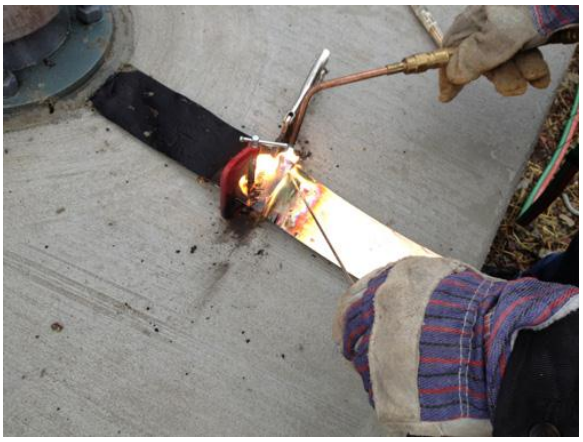
The Motown Update

By
Joseph M. Huk, Jr.,
P.E., CPBE, CBNT
Chief Engineer, CBC–Detroit

WRDT Monroe Site

In last monthôs article, I noted that we had two of our four tower piers that were cracked and worn, encased with new concrete. In order to do the job, we needed to temporarily remove the copper ground straps that crisscross the pier.

The straps in the original installation were coated with roofing tar to deter copper thieves. Unfortunately, that required a generous amount of brushing and elbow grease to remove the tar so that they could be joined to the required copper strap extensions. In the pictures below, you can see the joining of the new copper strap extensions and the finished tower pier installation. The only thing left is to put a fresh coat of tar on straps.



Brazing the new strap to the stubs of the old.

The ZipOne Codec Blitz

One of our long time client broadcasters, Pastor Tate, wanted to purchase a Telos ZipOne IP codec and associated equipment so that he could do his broadcast from home. Since he lives outside Detroit, he wanted to avoid the drive into the studio at 3:00 in the morning during the winter months.

When I was helping him with his installation, he mentioned that he had a portable rack equipment bag. I never knew that someone had such a case. When he brought it over, I installed the headphone amplifier and ZipOne in the rack. The package is so compact you can carry it on an airplane. I found this to be a very handy enclosure.

In addition, we had two chiropractors, Dr. Lazar and Dr. Cramer, who do a show on Tuesday nights. Both of them come from opposite directions with respect to our studio location. To save the time, they wanted to join our group of broadcasters who are currently doing their broadcasts from remote locations.

The equipment installation that I prescribed for Dr. Cramer was very straightforward, using the Artccessories MyMonitor to provide the mix of

Completed ground strapping, tar application pending.

studio and local audio. However, Dr. Lazar requested a system that would allow multiple participants. Therefore, he needed headphone monitoring and the audio mix-down for multiple users.

The system uses a Yamaha MG102c for the audio mixer and an Artcessories four-channel headphone amp for the headphone monitor. The only

issue was that the mixer has a line-level output and the MyMonitor requires a microphone level input. Rather then modifying the MyMonitor unit, I built a 40 dB ñHò pad attenuator to accommodate its microphone level input. The headphone output was then fed to the four-channel headphone amplifier to accommodate multiple participants. The system was installed at Dr. Lazar home studio and so far all is working well.

The client's portable rack equipment bag.

Bob Dutko Project Enhancement

A few months back, I mentioned that a ZipOne system was created for our afternoon show host, Bob Dutko, so that he could broadcast his show from home on certain days. It became apparent that we needed to raise the average audio level from his

Shure FP410 in Bob Dutko's audio chain.

remote system so that it would better match the level of the studio originated program material.

Since our talk studio, where Bob does his show during the week, uses a Shure FP410 mixer using their Intelimix technology, it was decided to try to duplicate this same piece of equipment in the audio chain of the remote system. The FP410 was installed between the RE20 microphone and the Telos ZipOne. The ZipOneôs input level was then switched to line level. The light amount of automatic gain control (AGC) and limiting provided a modest increase in loudness to achieve symmetry between our WMUZ talk room and Bobôs remote studio.

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

Happy New Year, everyone! May God richly bless you and yours in 2013! Letôs make this the best year ever!

Iôve already had an enjoyable run-up to the New Year. I took some vacation time over Christmas, and my mother came to visit. Between shopping trips and eating at Cracker Barrel (her very most favorite restaurant), we managed to get a lot of rest. But put my Mumzay and my beautiful wife, Sandy, together and the retail world trembles with anticipation. Behold figure 1, which is my wife and mother after a full repast at Da Barrel. Note the shopping bag.

Mumzay and Sandy at Da Barrel

The Mayans were wrong about their apocalypse, but something still might occur. You see, Sandy also introduced my mother to the shopping channel, QVC. My dear father has passed on to his reward, which may be a blessing, because heôll never need fear those dreaded words, ñTodayôs Special Value!ò and ñNow On EasyPay(tm)!ò

How Does AT&T Stay In Business?

That rhetorical question actually comes from Mike Cary, who has oft repeated it to us over the years. The fact that AT&T continues to operate is a prodigious miracle. Itôs a good thing I have a sense of óyumor, or Iôd never be able to deal with them at all.

As pointed out previously, getting real high speed access in Birmingham is a trick. At present, we have a horrible collection of DSL lines (two with Hiwaay Internet and one with AT&T), as well as a co-location for the mail server at Hiwaay Information Services across town.

More than once, AT&T has come to install a service at one of our studios, only to kill something else. When we were at the old Goodwin Crest location, Todd and I learned to keep a gimlet eye on the T1 lines whenever AT&T was in the building.

But at least they take pride in their work.

More than once, theyôd install a new service *by disconnecting something else so that they could re-use the copper*. Their records would show that the pair was available, even though our company or Citadel might have a T1 or ISDN riding on it.

AT&T's Left Hand Doesn't See The Right

This is simple incompetence and (in best *Cool Hand Luke* voice), ña failure to communicate.ò AT&T now has ñspecializedò technicians and contractors for each type of service, and they apparently never talk to one another. At all. Here at the new studios, Todd, Jimmy and I continue to employ the Gimlet EyeÊ : if we see an AT&T van at the pedestal in front of the building, we just assume that something will die as he/she pulls away.

Even within the same tech specialty, though, AT&T applies pressure to get the job done as quickly as possible, which leads to more mistakes. A couple of years ago, we ordered a new AT&T Uverse line, desperately seeking more upload speed. The tech spent about 10 minutes in the closet, then said, ñOK, itôs done.ò He seemed inordinately happy and satisfied, so (being experienced with this sort of thing) we checked ... and sure enough, one of the Hiwaay DSLs had died. *The tech had simply reused that line without checking.* No wonder it had been so easy!

Donôt get me started on their service department, either. The reason we use the Gimlet EyeÊ method is because itôs best to tackle (wrestle to the ground, lock in a half nelson) the technician before he/she leaves if thereôs a problem. Calling AT&T starts with a foray into Voice Menu Land. (Insert sound effect: me or Todd saying, ñone ... yes ... no ...ò to their wonderful Automated Trouble Reporting System). You then go through levels of ñescalationò before theyôll actually fix your problem.

More than once, our T1 line to 101.1 FM in Cullman has died on a Friday afternoon. The most recent was the Friday before Christmas; Todd was off, so I handled this one. I told AT&T that we operated 24/7 and needed it as soon as possible. I didnôt hear anything, so I checked a couple of hours later. AT&T had decided that we had closed at 5 or 6 PM! They had rescheduled for Monday, so no overtime, huzzah! I called and screamed politely that we needed it fixed right away.

The next joy is that they finally fixed the line, but never informed me. I woke the next morning and discovered that it had magically come up during the night. And they wonder why Sandy and I arenôt interested in one of their marvelous high-speed-and-TV packages for our own home? Iôd rather use dialup and VHS tapes! But now we get back to...

The Metro Ethernet Saga

Last month, I said that we were *this* close to getting our new fiber high speed Metro Ethernet. I should have known better, given that both AT&T and Windstream (another prodigy, worthy of a separate article in and of itself) were involved.

We had been keeping a close eye on Metro Ethernet service, hoping and praying that it would finally make it to our studios. We watched eagerly when AT&T ran new fiber on the poles outside, early in 2012. Halloo! (An aside: AT&T left one end of a fiber run terminated in a weatherproof box lying in the mud on the ground; thatôs just how they roll.) But every time weôd ask, AT&T would insist they didnôt have fiber at our location ï *even though we could see it on the poles through the windows in Engineering!*

Stephanie Crawford pitched in and checked with Windstream, who ñdiscoveredò that they could, in fact, offer it. Remember, Windstream uses AT&Tôs lines. They buy in bulk, then resell to us. Following economic logic that would doubtless give Adam Smith a migraine, it ends up being cheaper that way. But the key amusement at this point is that *Windstream knew what AT&T offered at our site – and AT&T didn't.*

Enter: The Horde of Huns – Er, "Specialists"

OK: AT&T provides the fiber and the interface; Windstream ï who buys the service in bulk from Ma Bell ï then provisions it and you pay them for the bandwidth. What this means in practice, of course, is that you donôt have diddly until both companies have their acts together and actually get everything working.

Now letôs get back to that ñspecialization.ò AT&T doesnôt just send out A Guy To Do Everything. They must send out several different crews on different dates. To keep this brief, I wonôt bother to list dates and times. Just be aware that this took place over *several months.* At no time did less than a week or two expire between each of these events (and Iôm omitting the several trips by Windstream, interspersed throughout):

- An AT&T guy came to look over the site. Said our utility closet looked OK.

- A two-man AT&T crew came to look things over (again) and said we needed to add a grounding strip (even though there was a perfectly good strip just a few feet away). I installed one and even left some bare #6 copper for them to use.

Interlude: the conduit from the utility closet to the pole outside, about 100-120 feet worth, was

blocked. Todd heroically tried to clear it with a fish tape, but no luck. Cris graciously allowed us to call a local ñrooterò company to clean it out and pull a rope. A month went by and we passed the scheduled install date with not a word. We asked Stephanie Crawford to look into it.

There had been another miscommunication; AT&T thought that we werenôt ready because one of their techs had reported that the conduit was still blocked (it wasnôt) and we didnôt have proper grounding (we did). Did they inform us of this? Of course not. After a merry round of arguing, AT&T said that they would ñescalateò (oh, how Iôve come to loathe that word!) our order. The recap continues:

- Another AT&T guy came by and looked everything over. Again. Did nothing else.

- AT&T sent a two-man crew to pull a mule tape through the conduit, using our rope. Did nothing else.

- AT&T sent a four-man crew, in a lift truck and separate van, to pull the fiber through the conduit using the mule tape. Did nothing else.

- AT&T sent a guy to examine the fiber and pronounce it Good. Nothing else.

- AT&T sent a two-man crew to install the worldôs ugliest interface box for the fiber. Still wasnôt actually working, but we were making progress. We hoped.

- AT&T sent another crew to make the box work. Still no Metro Ethernet, but we had blinky lights.

As I write this, still on vacation, Todd has informed me that Windstream promises, double-dog swears, hand raised, solemnly, spit and shake on it, that we will have Metro Ethernet sometime around January 6th. *And we ordered it back in July!* Needless to say, we are not holding our breath.

Oh, and I forgot to mention: remember that new grounding strip that one of AT&Tôs ñspecialistsò insisted that we install? The later horde of Huns ï er,

The World's Ugliest Interface Box

technicians ï just used the original ground strip. The copper that I left in the closet is gone, though. There you go.

Like I said, a sense of óyumor is *essential* when dealing with these people. But thatôs enough. I apologize for the rant, but it was ... cathartic. Surely you understand?

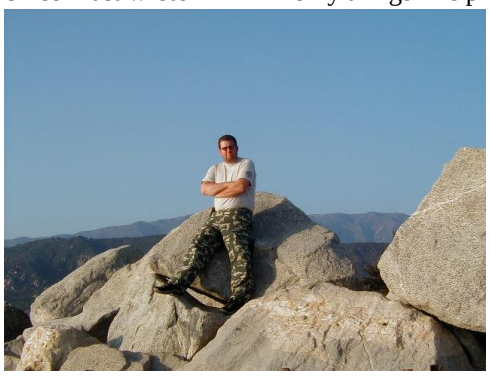
Until next time, continue to pray for this nation (and for our sanity when dealing with Windstream and ATT)!

Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Oak Flat! I hope this edition of *The Local Oscillator* finds you all looking forward to a joyous New Year.

It has been several months since I last wrote in these pages, partly because of my workload as we built our new KBRT Oak Flat transmitter site and partly because Cris had most of the good stuff covered. Now, as we wind down and complete the finishing touches, I begin to look toward another big part of this job, the move of everything from the old KBRT Ranch transmitter site on Catalina Island.



I went to the island last week to deal with a T1 issue and it really began to hit me just how much work is still left to be done there. The Oak Flat site is looking great and I expect things to run smoothly up there once we go on air sometime in early February, but the work to be done on the island after that time will most likely require some very creative planning if we are to at all avoid the usual island chaos.

You all most likely remember all the work that it takes to maintain the island site, so you can probably imagine the condition of things there now as I have been tied up here on the mainland since early August, leaving the island site to run unmanned for over a month at a time between quick visits. I must say, since Steve Braley of Nautel and I resolved the issues with the Nautel XL12 main transmitter, I have been amazed at how long we have remained on air without the slightest hiccup!

There are of course many other things that without constant maintenance build up to a point that take a lot of work get things right once again. Not only things like property upkeep, but things like generator maintenance, cleaning filters and of course, keeping the rodents out. I was able to get our T1 repaired and then found where a mouse had entered the facility through a broken washing machine drain pipe that quickly got sealed off. Then I noticed that a bird had decided to make a nest under our C-Band LNB cover so I cleaned that out.

I then had to get back to the mainland Oak Flat site as the crew from P&R Tower had begun to run copper strapping across the concrete V-ditches and required my help in gluing it down. I must say, it is no fun doing the back and forth to and from that island, so I will be glad when this move is done!

I will, of course, take plenty of pictures and document all that I can as we move all our stuff from the KBRT Ranch, just as Cris and I have done as the new site has gone up. It will be nice next year to sit back and go through all those photos and remember all of this. We have had some great times at the old site, as well as some times that were nothing short of miraculous.

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

Wow! Is it 2013 already? Where did the lifetime go? Well, not to worry, there are other things to talk about here, such asé

Answer to December question: What's wrong with this picture?

A bunch of folks picked up on this one, and fast. As promised, here are the first respondents to the query, in the order in which they came in:

- Alan Guthrie from K-Love.
- John Abdnour of Nautel. John gave the most glib answer: ñé .someone has the driven element in the wrong polarity. But, sometimes those things have a way of workingé sometimes better!ò [Well actually, not this time, John.]
- Steve Brown, the Radio Ranger. His comment: ñIf this gets fixed Iõd love to know how much more gain the antenna produces when the feed dipole and dish are aligned with the same polarity.ò [More gain the right way, Steve. Less than a watt almost overdrives the receiver three miles away when itõs done right.]
- William Sullivan, KQ103, Maitland, FL [And, thanks for the memory shout-out, Bill!]
- Al Hajny, Contract Engineer (didnõt tell me where he was)
- Bill Oglesby, who said, in part, ñthe 900 MHzé dish is horiz[ontally] polarized. The feed is vertically polarized. Will not work that way!ò [Well, actually it did, Bill. Just not as well.]

What I wonder is, what, if any, interference might have been caused to other users of the channel. We had side-lobe city there! As it turned out, I received no complaints. The good news is that the dish isnõt part of our main STL anymore, so I would have it shut it down at the first complaint call until the issue got fixed.

What is so much fun about doing this sort of thing is that itõs a great means by which we who create *The Local Oscillator* learn just how many and varied is our readership. Itõs an awesome feeling and Iõm grateful for the responsibility and the forum. Now, what else is going on?

LED Lighting Inspections

LED lighting as a replacement for the older technology 300 millimeter incandescent bulb code beacons on towers is almost a no-brainer, and no wonder. With a power draw of about one-tenth that of a two-bulb beacon fixture, itõs a real way to win smiles from the bean counters. Add to that the benefit of improved relationships with the towerõs neighbors, thanks to almost *no* visible flashing lights to bother those on the ground (and lower their property values, to hear them all tell it), and itõs easy to see why LEDs are taking over tower after tower.

Here at CBC-Chicago, we put LEDõs up on two of our towers for different reasons ï almost. At WYCAõs Beecher site, the three-phase emergency power generator was having an awful time with that on-again, off-again drawdown of almost four thousand watts from the three beacons on that tower on one of its phases. Its 60 Hz output was thus de-stabilized, keeping our main transmitter off the air. At WPWXõs Burnham site it was different; the big deal there was the antenna. The pole on which both antenna and beacon are mounted is so loaded with directional antenna parts that keeping the antenna safe from damage by human encroachment would be difficult. With an MTBF of years instead of months, LEDs made great sense there.

But a lot of folks donõt get that there are differences in maintaining LED lighting as well. Thatõs the point here. Letõs start with infant mortality. Iõve had to learn the hard way that, out of the box, red-only LED beacons either work or they donõt, in toto. We had one beacon which was stillborn right out of the box. Unfortunately, we found it out while it was being installed at the *top* of the tower, not beforehand on the ground. Of course we should have vetted it. We didnõt, because we

thought at the time that the factory had already done that job themselves. They hadn't. They *don't*. Silly us!

Yes, the manufacturers do vet their beacon products, but *if* and *only if* said beacons are of the "combination daytime-strobe, nighttime-LED type". In that case, the FAA *requires* that the beacons be put through a 36-hour burn-in period, *before* they are allowed to be shipped. Not true with the simple, night-only red-LED type. It would have been nice to have known that before the project. In our case, a check by the tower crew disclosed a cable connector which was missing a wire, which wasn't even connected to a pin, hanging down in the fixture. Splicing it in didn't help. Needless to say, we got a warranty replacement, and all the other LED beacons were vetted by us before they went up the other tower. All worked, and all are now in and blinking happily.

Then there's the issue of quarterly tower light inspections. Having LED side lights and beacons up there doesn't relieve tower owners of the responsibility for those inspections. It just makes the process more complicated. You've read from others in the past on these pages (Joe Huk, for one) that it's almost impossible to see LED beacons from close to the tower. Indeed. Enter binoculars, and good ones. A decent inspection of LED beacons and even side lights requires you to get away from the tower, and a good distance away at that. Try, at least a quarter to a half mile. LEDs are made to be seen by folks who are up in the air. What makes a tower's neighbors happy at the same time becomes a pain for the one who has to inspect those lights for proper operation.

We all know that LED lights are not a monolithic light source, like an incandescent beacon bulb. It's a whole bunch of little bitty sources, any of which can fail, either one at a time or, more likely, in groups. To my way of thinking, that requires not just one visual inspection of each tower beacon, but *four,* from four directions, about 90 degrees apart. Getting to those 90 degree points may not be easy, either. In the case of our Burnham site, for instance, at least one direction is potentially dangerous because we know of known criminal activity going on there. That's all we need to deal with. Thank goodness such inspections are only required quarterly.

Well, true, but don't kid yourself – the wise engineer also checks those LED bricks after thunderstorms as well. While the design of these LED wonders is aimed at making them statically bullet-proof, even the more-robust incandescent beacons can fall prey to God's Light Show. So, a word to the wise here is still called for.

Please don't let this note discourage you from investing in LED lighting technology. It's a great money- and energy-saver in the long run. But installing LED tower lights will inevitably require some changes in the way to think about maintaining your tower lighting. It's a small price to pay for all the advantages you'll be getting.

Going the Way of the Dodo Bird

The times they are a-changin', as the old B. Zimmerman song goes, and with them are going a lot of things that in earlier times we used to take for granted… And some we didn't.

For instance: RG-59/U. It used to be available at Radio Shack stores everywhere. It may be available on their web site, but try getting it at the local Shack shop. Go ahead, try it. Good luck. You can still get it – we got ours through Graybar at very low cost – but it's about the only place left where one can just walk in and pick it up, albeit at a minimum quantity of 1,000 feet.

The same is true with those neat little handy-dandy compression connectors that Bomar made and Radio Shack sold – and now everyone does, or did. But those types of connectors only work with certain cable types. I remember when we first got the tools and connectors for a project we were trying to complete. We had the worst time getting them to work, until we finally read the fine print. The message: those compressions only work on *specific* cable types and sizes. In researching that, I've learned that the particular cables specified in the connector specs seem to be among the most expensive types available. It kind of figures, now, doesn't it?

Now, in looking on the Bomar website, I learn that their whole line of compression connectors has been discontinued. It's enough to make you shake your head. Now what are we going to do with the $27 tools we purchased for these things a couple of years ago. It's enough to give innovation a bad name.

There are many more such examples of this sort of thing, which happen just to make our jobs a little easier (sure it is…). As I find them, and the time to chronicle them, I'll pass them along. If you have any such examples, you can send them to me and I'll unleash them to the masses.

Cleaning that Control Room Computer Keyboard

Now *that's* one of the grungier jobs that can befall any engineering folk. Those things get filthy! The thing is, it seems that the fave method of dealing with the problem has been to actually remove the keys from the board and get in there with a Q-tip and

some cleaner, or a vacuum cleaner, then clean the individual keys with the Q-Tip method before putting the keyboard back together, hopefully correctly. (Tip: Not putting a keyboard together right is a great way to haze a newcomer with no typing skills).

James Kelly has found a more efficient way of dealing with the problem, using only a flat-blade (or óminusô) screwdriver, a *clean* cleaning rag, some Formula 409 or the like, and some WD-40. Hereôs the method:

Start by turning the keyboard upside down and give it a good shaking to get the óhardô dust out. Brush that stuff away.

Next, fit the rag over the blade of the screwdriver. Next, apply some 409 to the rag on both sides of the screwdriver. Run the soaked screwdriver/rag between the keys, all the keys, until the spaces between the keys are all cleaned out. As needed, move the screwdriver to a clean area of the rag and reapply the 409. When all keys are cleaned on the sides, wipe down the top with the rag and 409, without the screwdriver (obviously). Then repeat the entire process, this time with the WD-40. The WD-40 removes all the soap scum which can lead to faster dust formation on the keyboard.

Time to clean a keyboard is less than half an hour, depending on how grungy the thing is to begin with.

With that, see you next month.

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

KLTT Power Module

Well, the KLTTôs Nautel NX-50 transmitter nearly made it a full year without any issues. On one of my trips to the site to check on things before a snow storm was to hit, I noticed the Status indicator on the transmitterôs AUI (control screen) was red. I took a look and noticed a cube (power module) fault. I did some basic troubleshooting only to find the problem not resolved. After speaking to Nautel, they had us switch slots with another module, so I moved the bad cube to the next slot over and the problem followed. This pretty much told us the fuse was okay and the cube was bad. Nautel sent out a new cube on warranty repair. Once received, I was able to install it and do an AUI reset and all is now fine on the transmitter. There is no indication of why the cube failed. Maybe Nautel can figure it out when they get it back.

CBC Uplink

In Denver, we are sending two programs out over the CBC uplink on a daily basis. We send a local program out, Experience Pros, as well as Healthline. And soon, we will be sending People to People. In the past, we have had the KLZ board op push a button I set up on our Wheatstone G6 control surface to send either Healthline or Experience Pros to the uplink. With the addition of People to People, I decided we needed a better way of switching.

To address this issue, we wired up a Broadcast Tools switcher at the KLZ transmitter site and now have AutoPilot switching the feed. We had a few glitches to start with, one of which was that the script to run Healthline didnôt work. It would show the next run time to be correct, but it would never run. Once I fixed that I found that People to People wasnôt working. The odd thing is, when the Unity Control scheduler is set to run, despite my having it set up properly, People to People wonôt run. Iôve decided to turn off the scheduler for now and leave the ports set as they need to be. Weôll see how it works from here on out.

KLDC Audio Issues

Twice now in recent days I have received phone calls that KLDC is cutting in and out. Everything looks normal on the Intraplex ï no dropped packets, and no alarms. Since I was not at the office when the issue occurred, I attempted to fix it remotely. I tried rebooting the Canopy Backhaul (STL) at both ends as well as the Intraplex CM-20 card at both ends. So far, the only way I have been

able to get it to work is to go in to engineering and physically reseat the CM-20 and the PTR-255 cards, then reboot the backhauls at both ends.

Oddly enough, when this issue occurs, so far both times, the KLTT Intraplex has gone to alarm. Iôm not sure how it could be related, but I still find it odd. KLTT stays on the air, so I guess until it becomes more of an issue Iôm not going to worry about it much.

2013…

2013 is here at long lasté well, not quite as I write this but it is just mere hours away. Christmas has come and gone and was a blast. I mentioned my new cat, Penny, the last issue and I am proud to say that she and my 4½ year old cat Scooby are getting along great. They play all throughout the house at all hours of the day and night together. As I write this Scooby is in a play tunnel I bought while Penny is on the outside attacking him.

I hope to have our new Burk ARC Plus units installed by the end of January or beginning of February. And we plan to replace the Intraplex units with APT Horizon Nexgen codecs in coming months as well.

Scooby (l) and Penny (r) before they liked each other.

But first things first, I need to update the operating system of our office firewall. It has the oldest operating system of any of our servers and firewalls with OpenSuse. We have moved on to CentOS and ClearOS for various things so I will be updating it to ClearOS after I get back from California. January will no doubt be a busy month with lots to write about. So until next timeé thatôs all folks!!!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

When the Files Are Gone

Picture this. While performing some general housekeeping on your computer, youôve inadvertently deleted some extremely important files and theyôre not in the recycle bin. Most, if not all, who work on computers on a regular basis have experienced this moment of panic as your blood pressure soars at the realization that your critical data could be gone forever. As with most other computer related problems, panicking is certainly not the path towards a solution. In fact and in this scenario, it can lead to your data being lost forever. So take some deep breaths and continue reading.

Iôll admit that Iôve lost more data than Iôve recovered. Most of which has been attributed to hardware failures rather than accidental deletion. Sometimes the data is trivial and should have been cleared off long before. In those occasions that the data is critical, I will obviously either go to the back-up version or, if necessary, will utilize some sort of data recovery method. When recovering from a back-up or image is not an option, data recovery software could be your only option. Iôve tried quite a few different software options. Like most other things, the correct tool to be used is directly related to the specific job being performedé and of course a portion of personal preference. I certainly have my favorite go-to recovery application, but I thought Iôd first highlight some of the other options available and provide my thoughts related to them.

The first option that comes to mind is Recuva from the folks at Piriform. Recuva is free and is extremely popular because of that. Considering that aspect alone, itôs a great piece of software and will be helpful in many situations. Based on my experience, itôs truly hit or miss. At times it easily recovers the sought after lost data. In tougher

situations, adjustments to the advanced options and a number of scans are required. Even when going that extra mile, Recuva sometimes fails to even find the files youôre looking for. When it does find the files to be recovered, it quickly recovers the data with no problem. Some of Recuvaôs features are outstanding, including the way it provides a health status for each file as well as thumbnail preview images for photo files. Again, you canôt beat the price and it does support NTFS and FAT file systems in one application.

Next is Remo Recover which offers a Basic version for $39, Media version for $49, and Pro edition for $99. Most users will be fine with the basic version of this software. Those who take photography seriously and store photos as massive RAW files may find the media version useful if trying to recover these types of files. Although certainly not necessary, I prefer the Pro version which provides the ability to recover data stored on damaged or lost partitions and even formatted drives.

Remo Recover does an outstanding job of finding lost files. In fact, it sometimes finds extra files that you may not even realize are on the storage drive. The primary complaint that I have with this software is that the search results are only displayed once the scan has completed. Depending on how large the storage drive is or the scan settings youôve selected, this process could take an hour or more. Similar to Recuva, Remo Recover also provides a quick preview of image files and goes a step further with audio file previews. If youôre willing to spend the money, Remo Recover is a good option.

Another option in the free category is Pandora Recovery. Pandora features an easy to use GUI, decent wizard, and does a great job of finding files. Many users will simply jump into the surface scan mode which provides more advanced options, although running through the normal wizard will certainly lead to data recovery success. The primary weakness in Pandora Recovery is that you will need to install the application on the drive you are attempting to recover. This is obviously not always possible which could eliminate it from your potential options. Regardless, I certainly recommend giving it a try.

My typical go to recovery option is an application called GetDataBack from Runtime Software. Unfortunately there are separate versions for NTFS and FAT file systems and they do come with a hefty price tag ($79 NTFS, $69 FAT). I know I initially balked at this investment, but it was worth the try when nothing else worked. I can honestly say that GetDataBack has never let me down. They do provide a demo version which allows you to scan, but not recover. This could be the perfect opportunity to pull out that problem hard disk drive thatôs been sitting on the shelf for years and see what this software will find on it.

Data recovery can be conducted via a directly connected storage drive, a network connection, or even a serial cable. This provides you with some options for recovery even if the computer wonôt boot up fully or correctly. Similar to some other options, GetDataBack allows you to sort files by type, date, or other criteria certainly making it easier to find specifically what youôre looking for.

I must say that my favorite feature is the ability to create a disk image of a trouble drive prior to attempting a data recovery. This allows you to work on the image itself rather than the damaged drive. Sometimes a drive can be nearing the point of zero recovery and this added feature provides you with the option to play it safe and increase the chances youôll be able to secure the critical data.

As I mentioned earlier, GetDataBack does come in different flavors covering NTFS, FAT, and even RAID recovery. Although you may face a bit of sticker shock, purchase of the license provides lifetime updates and outstanding user support. I have utilized this software numerous times and it has successfully recovered lost files of several different format types.

There are certainly numerous other options available on the market. Some will work perfectly in one scenario, but other situations may require another tool. By providing you with some different options, I hope Iôve at least given you some peace of mind the next time you realize that youôve just deleted some sort of irreplaceable data.

Happy 2013! Until next monthé

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
WDCZ • Buffalo, NY
970 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
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

CRAWFORD
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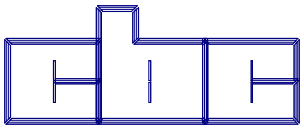

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