The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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A Major Upgrade

Last month, we completed a major upgrade at the KBRT studios in Costa Mesa, California. In this project, we retired an Audioarts D-75 console and installed a Wheatstone LX24 control surface and several new blades.

What makes this a major upgrade is that it makes KBRT the first all-AOIP station in the company. While several other markets have AOIP infrastructure and are all Wheatstone, they are hybrids, with much of the infrastructure in the Bridge Router TDM system. KBRT never had a TDM system, but it was an all-digital facility (AES and AOIP hybrid). Now we have taken it into the all-AOIP world.

We got a good look at the KBRT Oak Flat transmitter site on the approach to John Wayne Airport.

Amanda Hopp went with me from Denver to do this upgrade. On the approach to John Wayne Airport, we overflew the Oak Flat transmitter site and got a good look at it from the air. I counted four towers, which was a good sign!

We were met at the KBRT studio by operations manager/engineer Todd Stickler and Wheatstone's Kelly Parker, who flew in that morning from Las Vegas (a 35-minute flight).

Job #1 was to upgrade the firmware on all the existing blades, which were all 2015 vintage. Kelly took care of this, and he also upgraded firmware on the two existing E-6 surfaces and upgraded all the WNIP PC drivers to versions compatible with the new firmware. With that done, he helped us reconfigure our network to accommodate the added equipment and checked the settings in the Cisco switches.

The value of Kelly's help cannot be overstated here. We had put off blade firmware upgrades because we knew we would have to upgrade the driver software as well, and that can be a challenge – Windows and Nexgen often have different ideas about how the drivers work, and it takes some effort to sort things out. Add to that the replacement of the main Nexgen audio server and the equation starts to have a lot of variables. Kelly was able to plow through all of this and make certain everything was working correctly and talking over the network before he left the afternoon of the first day of the project. That effort gave us a solid foundation on which to proceed with the remainder of the project.

Todd had, before we arrived, prepared a CD with several hours of KBRT programming for that day, and when Kelly was ready to start doing his thing, Todd patched that CD directly to air on both KBRT and KNSN, which allowed us to take the Wheatnet system down. Todd had also done a lot of preparatory work, including swapping out the equipment in Production D; mounting satellite switches; mounting blades; making, testing and installing CAT6 cables from the new blades to the switches; and gathering up materials needed for the project. He did an amazing job and saved us a couple of days of work.

With the system back up, we were able to route the Nexgen audio server directly to air on both stations, which allowed us to start demo work in Studio A, the main control room for KBRT and KNSN. I had to start by tracing out several wires that I knew I would need later, namely the tally wires for the Studio A and Studio B "On Air" lights and the headphone feeds for Studio B (the talk studio). With those identified, labeled and pulled out of the way, I went to work with the diagonal cutters and had the D75 loose and out of the room in just minutes. That was the easy part.

The hard part, and the element that took the most time, came next: removing layers and layers of analog and AES wiring. This was made harder because the KBRT on-air AES bus was routed from the engineering room back to Studio A where it looped through the EAS encoder and also through the profanity delay. The KNSN program bus also looped back through Studio A and the separate KNSN profanity delay.

I couldn't just hack and pull because if I cut one of those loops, it would take one or both stations off the air, so I had to locate, identify and pull out each wire, one at a time, until I was left with only those two loops. As noted, that took a lot of time, but by the end of day one, I had Studio A demoed and the new LX24 installed, powered up and talking, but not actually on the air – we weren't ready for that yet.

The next day, we got an early start and began connecting local sources – Telos phone hybrid, CD player, CD and media recorders, etc. We connected the headphone feeds to Studio B and connected the mics to the new M4 mic blade. Periodically, I would run back to engineering and go into the Navigator program to create, label and route the new sources and destinations, then we would test them in Studios A and B.

By midday on the second day of the project, we put Studio A on the air and started watching for problems and issues. I ran an EAS test and tested the delay dumps, which are controlled through a Wheatnet logic function from a soft key on the LX24.

Once I was satisfied that everything was working, I took the post-EAS, post-delay busses from their assigned outputs on a couple of blades in the engineering room and routed them through to the STL and satellite codecs. That removed the Studio A AES loops from the circuit and allowed me to demo those last four wires in Studio A. It also allowed me to demo a lot of AES and analog wiring in the engineering room, and I spent several hours that afternoon tracing and cutting unused wiring, leaving

The completed Studio A with LX24 surface at the center. And yes, that is my reflection in the glass.

a neat, well-organized wiring bundle in the engineering room.

While I was doing that, we elected to go live with the new facilities, putting Studio B on the air through the Wheatnet system for the afternoon talk show. This gave Todd the opportunity to tweak the audio processing in the M4 mic blade. The host was thrilled with the way he sounded, and the talkback and tally functions worked perfectly.

One of the features of the M4 mic blade is a set of four USB ports that can be connected to any Windows 7 or later PC. As a test, in Production D I connected my Dell notebook computer to one of the ports. Windows recognized the "device" and in seconds I was able to play audio into the system. In Studio A, a similar notebook PC was long in place and connected as an analog source through the headphone jack and an interface box. We were able to eliminate all that analog wiring and simply plug the notebook into one of the M4 USB ports. The audio was much cleaner than it had been on the D75 with the analog lashup, and the connection is much cleaner and more elegant as well.

The last thing I did was take an Omnia3 processor we had in the rack for stream processing and repurpose it for creating a pre-delay processed program feed for local monitoring. We have long done this kind of thing in other facilities so that pre-delay pseudo-"air" monitoring can be provided with something other than the dry program bus.

By the end of day two, we were essentially done with just some tweaks to be made in the configuration software. On day three, we worked on those tweaks and got a Wheatstone software module installed in one of the production rooms to allow

Todd Stickler talks with Amanda Hopp at the Oak Flat transmitter site about switching to disposable filters for the NX50 transmitter.

critical analysis of client-provided audio (checking for proper phase, balance, etc.).

By mid-morning, we were done, and took the opportunity to visit the Oak Flat mountaintop transmitter site. I had not been up there in three years, and while I have kept an eye on the facility using our 4k camera array, I didn't really know what to expect. What I found was a pristine facility that was much better than I could have hoped for. Todd Stickler and transmitter engineer Fred Folmer had done a tremendous job of maintaining the site. Even the floor in the transmitter room was clean and gleaming. The directional antenna parameters were dead-on, and all the wildfire mitigation was in great shape. My hat is off to Todd and Fred – great job, guys!

From there, it was a short flight home with the good feeling and satisfaction that results from successful completion of a big project.

And of course my hat is off to Amanda. I really couldn't have done this project without her. She is very well versed in all things Nexgen and Wheatstone and was invaluable in getting this project done in the short time allotted.

Welcome Aboard!

In late July, John-Erick Rempillo (you can call him John) joined us as chief engineer of our Detroit cluster. John lives in Windsor, Ontario across the Detroit river in Canada and commutes across the border every day. His commute, he says, is probably shorter than many of our U.S. employees.

John comes to us from Blackburn Radio in Windsor. He has a BSEE and holds both CPBE and PECE (Philippine PE) certifications. He has been in the business for 24 years and is well versed in Wheatstone and Nautel.

We look for great things from John. Join me in welcoming him to our company!

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

Hello to all from Western New York! July kept us busy with numerous equipment failures along with outdoor work which normally accompanies the summer months. It's strange how we can go months without any incidents, and just when we get busy with summer maintenance activities, things begin to fall apart all around us.

The month of July started out relatively calm as I finished up the quarterly tower inspections at our six-tower array in Rochester, New York. The inspection went well with no major problems noted with the towers lighting and ground systems; all were in good shape. I was quite surprised at the amount of debris (dust, dirt, grass etc.) that had accumulated inside the doghouses since the winter inspections in March. I also noted the remnants of snake habitation, shed skins and droppings all around, so I will need to look at re-sealing the door jambs to keep the snakes and rodents out along with a thorough sweeping of the floors.

On Wednesday the 10th, Don Boye of Western Antenna & Tower was finally able to complete installation of the LED side lamps on towers 5 and 6 at the WDCX(AM) tower site. This work had been on the schedule for quite some time, and the weather had not cooperated in allowing Don to make the climb. A

rainy spring delayed many of the projects Don had scheduled, so he had quite a back-up of jobs he needed to get completed. We had hoped that after the two towers were re-lamped, he would be able to re-lamp the beacon on tower 4, but the temperature on that Wednesday was 86 degrees with no breeze and high humidity; after completing towers 5 and 6, Don had nothing left in his tank. We will reschedule that work for a weekend sometime in August.

On Monday the 15th, Verizon decided it was time that they upgraded our phone services at the WDCZ transmitter site. They removed the old copper lines serving our building and replaced them with new fiber, which hopefully will be more dependable than the old copper pairs. Looking back, we have reported the phone out at this location seven times in the past eighteen months. This outage only becomes an issue if the remote control needs to dial out with an alarm; we do not depend on the dial-up capabilities of the ARC Plus Touch for our system readings, as we use the web interface to monitor the transmitter and antenna array. At some point, as a fail-safe, I should program the remote to also send out emails in the event of out-of-tolerance conditions, another item to add to my to-do list!

I had mentioned earlier that we had several equipment failures to deal with in July. Among them was the failure of two of our Tieline Bridge-IT units. Both were showing signs of an almost identical failure, freezing up of the display along with random re-booting of the firmware. I spoke with Bill at tech support at Tieline, and he recommended reinstalling the firmware (upgrade) to remedy the issues. The first upgrade went very well, but the second unit decided to not boot up when its time came for the reinstallation of the firmware. Tieline will be sending me instructions on how to get the unit to boot up so the upgrade can be installed.

Another equipment failure was our music on hold tuner for our house phone system. I was using a Rolls tuner to feed the phone system with over the air audio, as the quality of these tuners is excellent, and the cost is relatively minimal as compared to compatible tuners. After troubleshooting the cause of the failure, I found that the power supply transformer had opened. A replacement transformer was ordered through Proaudio.com and the repair was simple and quick.

I was really surprised at how quickly we were able to get the replacement part. It seems these days parts are getting harder and harder to obtain. At one time, Buffalo had six electronics parts suppliers, and now we have none. If you need any electronic parts, resistors, transistors, capacitors etc. you have to order them, which increases the cost, as you have to pay shipping, and in many cases, you have to order a quantity far above the number of components you actually need.

Some time ago, we lost our TRE computer that provided PSD data to our RBDS, HD-1 and HD-2 services. Early last month, I began rebuilding a new TRE computer to handle the PSD data, and ran into problem after problem. The computer I intended to use failed just as I began installing the TRE software. After spending almost a day cleaning out this repurposed computer and reinstalling a fresh copy of Windows 10, the on-board video died, so it was back to square one.

Obtaining another Optiplex 780, I restarted the previous day's activities, this time with much better success. I installed the latest version of the TRE software, downloaded directly from the BE website, and began configuring the software with the settings I had available. Mapping this new computer to the Nexgen network went smoothly, and soon the Nexgen export was writing to the TRE software, with only one problem: the PSD data was not showing up in the TRE window. I used the same export file type and path I had used before, but it would not work with the new software. Evidently, BE changed the file type TRE wants to see from Nexgen, so I had to go back and change the file type from standard to xml.

Once I got that working and could see the PSD data in the data.xlm file on the TRE root, I began configuration of the RBDS data. I found that the RBDS portion of the software was grayed out, meaning that the license I had was not authorized for this service. A call into BE tech support with a request for an updated .bin file which contains all the license information for the TRE software was in order to continue the installation. Once I received the new bin file, I was able to complete this portion of the install.

After I launched the software, I noticed that only some of the data was reaching the exporter and RBDS encoder located at the transmitter site. The display would show a song title/artist and not update for several songs later. At other times, a generic liner would show up on the display and stay locked on it for hours, although the TRE window was showing the changes from NexGen as they occurred.

As I began troubleshooting this, I realized that the issue was in the delivery to the transmitter site from the studio, i.e. the STL. We are using a Moseley 6010 STL transmitter with a LANLink 900 for data and serial transport to the transmitter site. When I tried to ping the transmitter site, I was

obtaining a 70% failure rate of the data I was trying to send! I could ping each end of the LANLink locally, but not from either end. At this point, I plan on removing the unused LANLink we have in Rochester and re-programming them for use in Buffalo. Hopefully this will take care of this issue and we will be back transmitting PSD data for our HD-1, HD-2 and RBDS signals.

On Thursday the 25th, we experienced a rare occurrence at the WLGZ-FM transmitter site in Rochester. About 3:00 PM, the remote control called me to report the main transmitter was down. I called into the remote and was able to bring the transmitter right back up. I knew that it was a power issue, as the filaments were off when I called in. If it were just an overload shutdown, the filaments would not have been off. It stayed on for about five minutes and went off again. I used the same procedure as before, and we were back up.

That Thursday was not an exceptionally hot day, although the humidity was quite high, so I suspect that there were a lot of A/Cs running and a brown-out occurred, causing the phase-loss detector to shut down the transmitter. Several hours later, Mark Shuttleworth called to report we were off again. This time, there was no power at the transmitter site. Mark suggested that he would go to the transmitter site and with my directions, would bring the transmitter back up once power was restored. Once he got to the site, the power came back up and I walked him through getting the transmitter back on the air. This went smoothly, with one exception, there was no audio!

Knowing Mark's limitations, I jumped into the car and made the 90-mile trip to the transmitter to troubleshoot the audio issue. I suspected that the Flying Cow, an A/D converter that supplies AES/EBU to the Omnia.6 processor had failed, so a simple change of inputs into the processor would solve the problem.

Once I arrived at the transmitter site, I found that the Interplex channel that provides audio for Legends 102.7 was not working. All of the other audio cards were showing activity, just not the Legends channel. I had a spare audio card and re-programmed it for the slot it occupied, but it would not work either. Ed Smith was at the studio, so I instructed him on removing the transmit card in the Interplex frame and re-seating it. Soon, audio was back up and running!

We dodged a bullet on this one, and luckily there was no damage that occurred from this outage!

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

Wet, wet and more wet, with a break of a few days this past week. It has been raining almost continuously for most of July. My next-door neighbor mows our lawn for us, and he has been cutting like mad whenever there's a break in the weather. At work, we've had to call in Danny Dalton to do a bunch of cutting and trimming at all of our transmitter sites. The access roads need some attention as well. The tower bases at our sites are looking kind of scroungy, too. We took care of the weeds and brush at the 1260 site, and other work is on tap, especially once the weather cools a bit.

I've said this before: I thought it was hot and humid in Southeastern NC. I honestly believe that Alabama has my home stomping grounds beat. Fayetteville, NC traffic was pretty bad, but nothing like what we have here, either. The classic big cities (Dallas, New York, Philly) grew "up" as much as they did "out." Southern cities tend not toward skyscrapers and (relatively) compact metro areas, but spread and sprawl. In square miles, for example, Jacksonville, FL, is one of the largest city land areas in the world.

The end result is roads that are inadequate for the traffic, and no easy way to improve them. Right now, in Birmingham, the downtown junction between I-20 and I-65 is being reworked, and it's a nightmare. To travel between I-65 North and I-20 East, you have to leave the interstate and wind your way through a bunch of narrow city streets -- which were already overloaded

Figure 1 -- Been there, done that. Ouch!

to start with. Depending on which way you're traveling, it can take over an hour just to get across Birmingham. That might not sound too bad to someone in Philadelphia or Chicago, but remember, in land area and population density, Birmingham is considerably smaller than those great cities.

And don't get me started on Atlanta. Sandy has been seeing a neurologist at Emory, and we plan on at least 1-2 hours just to get out of Atlanta at rush hour. Atlanta combines the worst of both worlds: dense central city area(s) with badly-overloaded freeways in and out of the metro.

Dodging the Bullets

Thus far, we've dodged any major damage from the storms that have been rolling through. Most of them have either been well to the north or south of Birmingham; the central part of the state has largely been spared. One of our friends, a former coworker and fellow engineer at a TV station in Huntsville, AL, wasn't so fortunate.

Figure 1 is from a camera view of the strike that hit their tower the second week of July. I cringe just looking at that. He told us that they spent several 18-hour days trying to repair and patch all the damage. When you get a huge, direct hit like that, given our terrible ground conductivity here, you just do the best you can. It's my understanding that they're *still* finding damage. Been there and done that!

We have to clean the insides of our ATUs at the tower bases whenever it stays this humid, and we still get "sticky" contactors. (More on that in a moment.) Todd has also been doing double duty, cleaning AC coils to keep the buildings as cool and dry as possible. He has a portable supply of water and some coil cleaner, and takes it to each site to make sure the AC units are running properly.

And finally, on the subject of air conditioning, the big rooftop unit at the 120 Summit studios is scheduled to have yet still another compressor installed as I write this (Figure 2). We've warned the staff that the top part of the building won't be cooled for most of the day. Todd and Jack set up a temporary workspace for essential employees in the downstairs area, which is on a separate rooftop unit.

The operative term here is "rooftop." The compressor for a 35-ton AC unit is heavy enough to start with. They had to use a boom truck to get it up onto the roof, and then special equipment to get it into that old Trane. But at least they had shade!

Sticky Contactors

Now for those sticky contactors. Every now and then, usually after a long period of rain and high humidity, the Kintronic RFC-type contactors that we use at the 850 site in Tarrant will get sluggish about switching patterns. We have Damp-Rid in the ATUs, but when it's constantly raining and storming, that stuff turns into milky-white soup in short order. We've sealed every hole we can find in the ATUs, but we still get condensation inside. Pea soup humidity. Gack.

The most recent event was in the second part of July. WXJC refused to go to day pattern. A little investigation showed that tower #3 was the offender this time. It was taking too long, so the remote control judged the pattern shift a "failure" and dropped back to night. Further investigation with the Mark One Eyeball showed that some of the spring fingers in the contactor bodies had stuck and had been bent when the coil tried to bang them into position. We've ordered some replacement spring fingers and hope to get them installed the first part of August. For now, I've done my best to (re)clean and align the contact bars and fingers.

(Incidentally, I once asked Kintronics if there was a special tool available to help properly align those fingers; "nah," I was told, "we just use needle-nose pliers." Heh. That's what I'd been using; I imagined that they had some kind of fancy jig. Nope!)

I've also tried lubricating them with everything from Conducto-Lube to No Seize (the stuff that electricians use on large "lug" connections), but that didn't really work very well. If the lube insulates, well, you already know that isn't good. Even if it lets normal current flow, in our humidity, the grease would just wipe itself off or gum up, leaving an even worse mess. So far, the best approach I've found is just to clean them as often as we can, to replace any spring fingers that are looking kind of poorly, and to try to remember to keep the Damp-Rid fresh.

A New Firewall

We've been installing firewalls between our critical servers and the public Internet. In July, Todd helped Steve Minshall and the gang at KCBC put a ClearOS system on their network. We also installed a firewall on our corporate web server. For the latter, I chose OPNsense, the same open-source firewall that we use now on our mail server. OPNsense is much better at blocking bad IP addresses. On our mail server, I use some publicly-available block lists. OPNsense downloads and updates the "known bad" IP lists every 24 hours. We're going to do something similar with the Web server in Denver.

Amanda took care of the hard work out in Denver – mounting the server, changing the network configuration, stuff like that. It's always tense when we have to do something like that, especially for someone like me, sitting many hundreds of miles away. It's always a relief when the bugs are straightened out and we can get in remotely to finish the configuration.

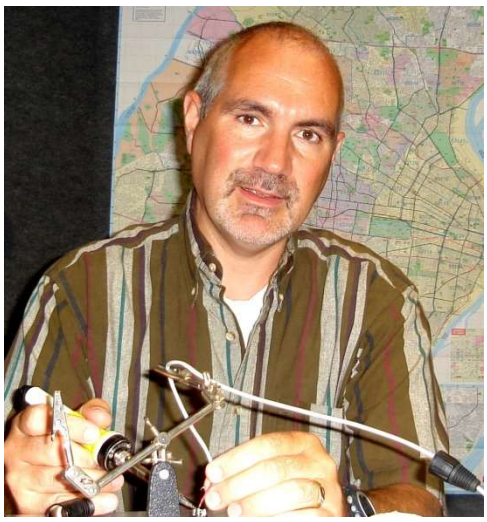
The goal is to have our backup Web server put behind that firewall on the same subnet. Should the main server go down, we can very quickly go into the firewall and switch to the backup. (This could be automated, but we want to keep it simple, and we can remotely switch the firewall.) The only drawback to this approach, as we learned a while back with our email server, is that if the firewall dies, you're down and out. To help prevent that, Cris ordered some top-of-the-line Dell hardware for firewall service. No home brew or "clone" stuff for us!

Until next time, keep praying for this nation!

Figure 2 -- Plan ahead: bring your own shade!

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

About this time a year ago, the decision was made to move our towers from the traditional red lighting at night and red/white paint for daytime obstruction, to daytime strobes with red lighting at night.



This was mostly due to a combination of factors: the ever-increasing costs of tower painting, FAA rule changes and technological advances in tower lighting. Of the four transmitter site towers in our Chicago cluster, only one was using daytime strobes instead of painting. The daytime strobes were xenon with mainly incandescent fixtures for nighttime red lighting. The other three were red lighting with some incandescent and LED fixtures.

When I first came across the newer Dialight dual lighting systems, I was excited about the fact that the daytime strobes were LED. It made sense with advancement in LED lighting that daytime strobes would be the next step in tower lighting. The fact that the daytime strobes were combined into one flash unit made it even more economical to switch a tower from being painted to a daytime strobe system.

Last year, we budgeted for and were about to schedule for painting of our tower at the Beecher transmitter site. To be honest, over the past four years, we have had two towers painted with a third to be painted last year at the Beecher site; each time, the bids were higher.

Once I found the Dialight system with dual LED lighting, I put the brakes on the painting project. We found that the cost of the Dialight system with installation was not that much more expensive than painting the tower just one time. We decided then to go with the tower lighting upgrade rather than

A tower worker installs a new flash head on top of the Lansing tower.

painting. With the daytime strobes, we didn't need to paint the tower ever again.

Tower painting was something that we usually had to do almost every five years for each of the three towers. With the ever-increasing cost of painting, the dual system became very attractive for the other two towers that were getting painted on a regular basis as well.

As mentioned above, the Lansing tower site already had an aging daytime strobe system with an even older incandescent red system. Both systems had issues and we were constantly working on them. With that in mind, and the electricity cost savings that would be realized, we decided to do this tower as well.

So, this meant we were installing this system on our remaining three towers this year, since the Beecher tower was finished last year.

This meant we were really busy at the end of June and early July as we had a tower crew in town to install the new tower lighting systems on the three towers. Of course, most of the work that we as the engineering crew did on this project was performed beforehand, in early June, as we completed the inside work.

The engineering crew installed the new tower light control boxes at each of the three sites. These boxes are not small nor light. However, we had a fairly easy installation compared to the Denver crew, who was putting these huge, heavy boxes twenty feet up in the air on their AM towers. So we won't dare complain about our backs hurting after holding these boxes three feet off the floor. In addition, our local crew ran conduit with new electrical runs to the boxes. We also installed the new photocells.

Once we had our portion of the work done, we waited for the tower crew to come into the area and do their part. They took down the old tower light fixtures and installed the new dual LED flash heads. They also installed the new wiring down the tower to the lighting control boxes inside our building.

It took them five days to get all three tower lighting systems installed. They were experienced with these systems, and it showed in how quickly they could get them installed. It is certainly different to now approach our towers during the daytime and see strobe lights. It takes a few trips to get used to this.

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

I recently saw an interesting "mural." To understand the Portland flavor takes a bit of a back story.

According to the TV show *Portlandia*, Portland is the city where aspiring young artists come to retire. In reality, driving the streets of Portland, buildings have taken on the 1960s psychedelic appearance – six-story buildings painted in jagged contrasting lines of clashing colors.

These displays have now taken on the euphemism of "murals," not to be confused with the fresco murals adorning the ceiling of Sistine Chapel.

Twenty-five years ago, a few old murals came to light when the neighboring building was torn down, reveling the painting on the building that had been hidden for years. These were actually turn-of-the-last-century's advertising. With true local government control. the city council quickly stepped in to prohibit any additional such "murals."

Into this mix now enters Portland two-pronged common sense: spray paint control legislation. As graffiti and tagging grew, city regulations expanded to lock up point-of-sale paint cans, limit quantities, and require background checks prior to purchase.

The second prong is a requirement that all owners immediately repaint all buildings that are tagged.

Of course, some people believe that tagging is somehow "artistic." And of course those same people would be horrified to receive the bill to repaint.

Missing from this equation is any attempt to identify and punish the culprit holding the paint can.

The resulting tectonic stress has begun to show, and Portland has removed its prohibition of murals, and building owners have moved to adopt them as a defense strategy against tagging. The operative theory is that taggers would not deface murals. The result: an explosion of six-story, high-density buildings painted in jagged contrasting lines of clashing colors.

The interesting mural I recently saw is located on a local freeway overpass. The guardrail is concrete construction with glass panels intended to limit pedestrian ability to throw objects down onto the freeway. The concrete base panels contain the mural shown in Figure 1.

I would never have suspected that radio and broadcast towers would be the subject of a mural art. Portland's Stonehenge and Council Crest towers have become iconic symbols of the city. I did notice these towers do not comply with aviation marking codes. I also wonder about the hummingbirds supplicating the RF emissions from the tower.

Now for the punch line and the rest of the story. Taggers have begun to deface murals. Oh well… such is life in Portlandia.

Figure 1 - Radio towers in a Portland mural.

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

KBRT Trip

I don't get to go on many business trips. The last one was probably three years ago, always to KBRT. The project for this trip was to update all the Wheatstone blades and drivers and then install the new LX24 console. We are very grateful that Kelly Parker was able to meet us at the studios once we arrived. His help made the process go so much smoother. He did the updates for us while we began figuring out a game plan for the rest, tracing out wires and making sure everything continued working during the updates.

Once the updates were done and Kelly left, we began working on installing the LX24. This first started off with pulling wiring. We had to trace down and uninstall wiring, leaving a few pieces connected to keep things on the air. This was a tedious task. Trying to trace out where certain wires went took a bit of time, but we were able to end the first day having most of it pulled out. The next day we were able to install the LX24. We were able to connect what we needed and test everything out. There were some things to do elsewhere to get things working that I wasn't really a part of. I mainly worked on cleaning things up, making things look good again since we had made a mess.

Our final day in California, we did a couple last minute things at the studio before we headed up to the tower site. It is a fun site to go to. I wish my sites would stay as clean as KBRT. The way it was built, with the concrete walls around it, really helps keep the dirt out. Keith and I work hard to keep the sites clean, but the dust just keeps on coming. We didn't stay at the site too long, as we needed to get to the airport to catch our flight back home. It was a fun trip for me. I enjoy getting to learn more about Wheatnet and how it all works, and being able to set up a new surface I've never dealt with and learn a bit about it was also fun. I look forward to when Denver finally gets to upgrade our bridge system so we can be 100% Wheatnet. I will at least have a little bit of knowledge as to what to expect.

Mowing

Mowing season is here. With the monsoon flow here, growth has skyrocketed. We started with KLVZ, as the county called about the thistle growing. They don't want it to seed, get in the South Platte River and contaminate downstream crops that use river water for irrigation. So Keith spent time while we were in California mowing that site. The next stop for our tractor is KLTT. Thankfully, the growth out there isn't too bad, but still, I like to keep it mowed. There is less of a chance of a surprise by a snake when the grass is short, and of course it reduces wildfire danger. I hope that this will be the only time this year we need to mow. Get it done and let it dry out at the site. Only time will tell. It's not like the weather in Colorado this year has been normal.

Upcoming

With the travel, July was incredibly slow in Denver. August will most likely be the same. I am on vacation the first week of August. It is always a time I look forward to. My parents, husband and I rent a couple of cabins in Lake City, Colorado each August and spend the week having fun: ATVing, fishing, exploring, and relaxing. I know that once we get back, we may need to finish mowing at KLZ before putting the brush hog up for the year. Other than that, I have nothing planned. Just normal maintenance of the sites and equipment.

That about covers it for this edition, so until next time… that's all folks!

KBRT • Costa Mesa - Los Angeles, CA
740 kHz/100.7 MHz, 50 kW-D/0.2 kW-N, DA-1
KNSN • San Diego, CA
1240 kHz/103.3 MHz, 550W-U
KCBC • Manteca - San Francisco, CA
770 kHz/94.7 MHz, 50 kW-D/4.3 kW-N, DA-2
KKPZ • Portland, OR
1330 kHz/97.5 MHz, 5 kW-U, DA-1
KLZ • Denver, CO
560 kHz/100.3 MHz, 5 kW-U, DA-1
KLDC • Brighton - Denver, CO
1220 kHz/95.3 MHz, 660 W-D/11 W-N, ND
KLTT • Commerce City - Denver, CO
670 kHz/95.1 MHz, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Denver, CO
810 kHz/94.3 MHz, 2.2 kW-D/430 W-N, DA-2
WDCX • Rochester, NY
990 kHz, 107.1 MHz, 5 kW-D/2.5 kW-N, DA-2
WDCX-FM • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDCZ • Buffalo, NY
950 kHz, 5 kW-U, DA-1
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT
WCHB • Royal Oak - Detroit, MI
1340 kHz/96.7 MHz, 1 kW-U, DA-D
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ-FM • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WMUZ • Taylor - Detroit, MI
1200 kHz, 50 kW-D/15 kW-N, DA-2
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/95.3 MHz, 5 kW-D/41W-N, ND
WXJC-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT
WXJC • Birmingham, AL
850 kHz/96.9 MHz, 50 kW-D/1 kW-N, DA-2
WYDE-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

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