The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

Progress!

We are making real progress on the ground with the KBRT mainland transmitter project in Orange County, California. While utility construction has been underway near the site since late May, in June work began at our site, starting with a pre-grading meeting that took place on June 20.

County grading inspector, right, conducts the pre-grading meeting at the new KBRT site.

At this meeting, the county grading inspector told everyone present, including our general contractor, the soils, civil and structural engineer and myself, what was expected, what the inspection procedures were and the things to watch out for. Then the archaeologist and paleontologist who will monitor the excavations told us all about their procedures. We ended the get-together up on the hill with a walk-through, looking at some drainage issues and settling a few questions such as transformer pad location and how we will deal with a water crossing across the southwest part of the property.

With that out of the way, we were clear to begin grading operations at the site. This includes cutting the "pads" for the building and all four towers

(the locations where these items will go, not concrete pads as the terminology may suggest), and constructing a silt berm (essentially a dam with a standpipe). By the end of June, all the cuts had been made and we are now ready to begin the fill and compaction at each of the locations. Finally… dirt is moving at the site!

The utility trenching is moving right along and we have completed some 3,600 feet of trench and conduit, including six concrete pull boxes. We have about 1,200 feet and one additional pull box to go. We also have to install a concrete pad for the transformer. Once that is done, Southern California Edison will pull the wires into the conduit and we will have power at our site. I am still debating whether we will install a temporary power feed. That

The general contractor sets one of the concrete pull boxes in place for the 12 kV electric feed to the site. The 5-inch conduit is visible in the trench.

would be handy for a lot of things, including powering tower lights, but the expense may dictate that we use solar power or portable generators to take care of those things until the building is set in place and permanent power feeds are run and connected.

Our contractor has set up his "base camp" at the top of the hill, up where the old W6RR "hamshack" used to be (we demolished what was left of that structure back in April, leaving just the concrete slab). That location provides him and the workers that are staying in a travel trailer at the site during the project a clear view of the entire property as well as much of the road where the utility trenching is going in.

One "housekeeping" task that we had to take care of turned out to be a real pain – mowing the 27-acre property. We had to do this for a couple of reasons: fire protection and worker safety. Most of the site is covered with grasses that were in many areas close to waist high. If a fire came through that area, this standing fuel would be a real problem for us

Bill Agresta operates the tractor and "disk" to mow the site.

and firefighters. And just walking around on the site was a real challenge. There were all kinds of obstacles scattered around the property, everything from rocks to old guy, antenna and ground wires down in the grass where you couldn't see it. There are also a few holes and more than a few snakes, including rattlesnakes. Being able to see what you are about to step on is pretty important up there!

Bill Agresta rented a tractor with a "disk" (a large brush hog) and mowed all the site that he could while a couple of helpers walked in front of him to identify and move obstacles. Some of the site is rather steeply sloped, so Bill had to be really careful when mowing in those areas, and there were some places that he didn't mow at all.

The early part of this month will be devoted to getting the tower and building pads ready, taking care of the drainage plan, pouring concrete for the dam and rebuilding a badly eroded slope to the south of the building pad. The utility work will also be

wrapped up so that Edison can come do its thing. The crew from P&R Tower out of Sacramento plans to be on site on July 16 or thereabouts to begin tower base and guy anchor pier drilling operations. We will have the paleontologist present for that to observe the tailings for any signs of dinosaur bones. Towers should be up and conduit runs from the building site to the towers should be in place with trenches closed by August 27, and after that the general contractor work will resume, pouring the slab for the building, installing the foundations for the screening/security walls and stacking the block.

We look to have the building in place around the middle of October, and that's when we will install the phasor, transmitter, rack, etc. Transmission lines, sample lines, control cables, power cables and fiber-optic lines will be pulled into the conduits in late October, and that's when we'll set and connect the antenna tuning units at the tower bases. As soon as we have power permanently connected to the towers, we will get the 11 GHz microwave link established to the studio.

Once all this is done, we will install the ground system, and following that we will be ready to do the tune-up, MoM proof and file the license application.

At this point, barring some significant snag, we should be ready to begin operation from the new mainland site before Christmas. What a Christmas present that will be!

Between now and then there is a tremendous amount of work to do. It's almost overwhelming, but it's so good to be finally moving dirt that perhaps the scope of this hasn't set in yet. Moving forward, we'll continue to take things one day at a time, doing all we can as fast as we can.

Microwave Link

We received grants on the licenses for the 11 GHz microwave link between the KBRT Costa Mesa studio and the new tower site in eastern Orange County. We have also ordered the equipment for this link, a Dragonwave Horizon Compact, which is very similar in architecture and function to the Trango Apex links that we have in place in Denver, Chicago and Birmingham.

The primary difference with the KBRT link is that we plan to employ a fiber-optic cable to connect the transmitter site end of the link to the equipment in the building, eliminating the need for an on-tower Ethernet switch. A weatherproof NEMA box will be installed on the tower at the microwave antenna elevation to provide power to the radio, which mounts on the back of the antenna. A conduit

carrying two duplex multimode fiber-optic cables will terminate into this NEMA box, and one of those cables will loop out and plug into the radio. The other will be coiled and left in the NEMA box as a spare should we ever need an additional link or the other cable fail for some reason.

In June, I learned a new skill in preparation for this use of fiber-optic cable at the new KBRT site: installing connectors on tiny fiber-optic cable. The installation is unlike anything I have ever done before, and it requires special (and expensive!) tools and a "clean" environment. The connectors themselves, in this case "LC" connectors, are also expensive at $17 each, so you sure don't want to mess up any if you can avoid it. I will confess to messing up only one as I was learning. Subsequent connectors went on without any mistakes.

The Owens-Coring installation tool kit includes a "continuity tester" which is essentially a red laser with the proper connectors to adapt to any of the commonly used fiber-optic connector types. This tester is in place and turned on during the connector installation process, and you observe the other end of the cable for a flashing red light to make sure that everything is going on right. Once you've crimped the tube on the connector, if you don't have continuity then you've just wasted a $17 connector and a good bit of time and effort.

The connectors I installed showed good continuity, but I wouldn't be satisfied that I had done it right until I passed some data through the fiber. To test that, I ordered a couple of miniGBIC SFP modules for our Cisco gigabyte Ethernet switches, and I used the fiber-optic cable with my connectors installed to connect one switch to the other. I was thrilled to see the ports light up green when I inserted the connectors (interestingly, they lit up *before* I had fully seated the connectors – as soon as the detectors could see the end of the fiber, they were "connected"). I was even more thrilled when I connected my notebook PC to a port on the switch and was able to connect to the outside world! A throughput test showed full bandwidth. I guess I got it right!

Fiber-optic connections are a bit fragile, and it's going to be interesting to see how we eventually protect them during pulling operations through

conduit. Since I don't plan to climb the tower and install connectors on the fiber while hanging 280 feet in the air, we will have to pull from the top of the tower (with the connectors that go at the top of the tower already installed). Once we get the cable into the building I will install connectors on the bare fibers at that end.

Like I said, it's going to be interesting. But I think using fiber will pay off in the end for both bandwidth and our ability to run it across an energized tower base without decoupling.

Mounting the microwave link on the studio roof is another challenge that I am having to work through. There is no mast or other structure there that I can attach to, and we also have an "HOA" of sorts to deal with (our studios are in an office "condo" complex). What we do have is a non-penetrating roof mount for our 2.4-meter Ku-band uplink antenna. That is an offset antenna, which means that the dish is nearly vertical. The NPRM has a 6.5-inch pipe that the Az-El mount for the satellite antenna sits on, and three feet or more of the 6.5" pipe is exposed below the mount.

My thinking is that we can have some galvanized angle-iron fabricated with holes drilled to go on either side of that 6.5-inch pipe on one end and on either side of a 4-inch pipe on the other, creating a standoff mount, so to speak, for the microwave antenna. We will make the 4-inch pipe tall enough to get the microwave antenna up so that the top edge is just below the top lip of the satellite antenna, thus screening the east-facing microwave antenna with the south-facing satellite antenna.

KBRT operations manager Todd Stickler tells me that on a clear day he can stand on the studio roof and see the NOAA radar ball that is just south of our site, and he can see our hill just north of that. This, along with the path studies I have run, indicate a clear path, but of course I can't rule out that a palm tree in the studio neighborhood will be in the perfect location to obstruct the path. That is unlikely, but I won't draw an easy breath in that regard until we establish a working link. "Plan B" if that doesn't work includes a couple of towers within a few blocks of the studio. I'm sure we could rent some space for a clear shot from those higher structures.

Brian Cunningham is on vacation. His column will return next month.

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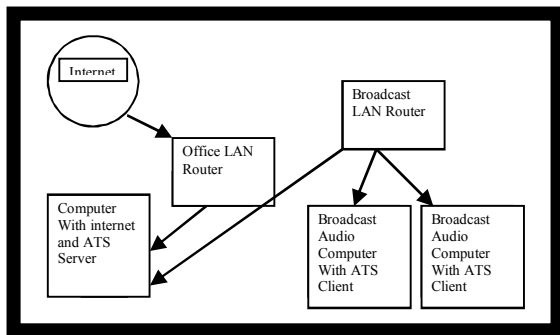**P.E., CPBE, CBNT**
Chief Engineer, CBC–Detroit

Last month, I spent some time optimizing the way our facility synchronizes all of its computers and broadcast equipment clocks. Since we have two networks, one being for our office and the other exclusively for our broadcast infrastructure, we needed a solution that would suit both.

All of our office LAN has internet access. Our router's firewall protects the machines from any outside intrusions. The audio delivery and broadcast equipment LAN is very selective. Only certain machines have access to the internet. Since we are dealing with machines that are the lifeblood of the facility, we have to be very careful. For some time, I was looking for a way to synchronize all of the broadcast system clocks without having to give every machine access to the internet. Specifically, I was looking for a network time server. To my pleasant surprise, I found the program called Analog X Atomic Time Sync.

Atomic Time Sync

Analog X Atomic Time Sync (ATS) is a free shareware program that goes out to the internet and synchronizes the resident computer's clock to the National Institute of Standards and Technology (NIST) time standard. In our plant, we have several computers that are on both the broadcast LAN and office LAN.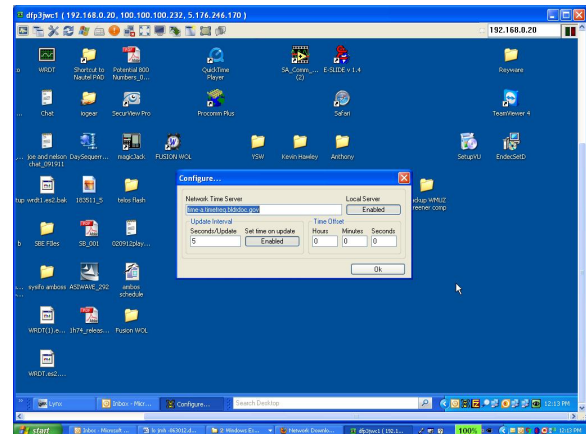 Therefore, we can place ATS on one of those machines and it will find the NIST time standard server on the internet. Not only is ATS a client, but it can also be set up as a server at the same time. This feature then allows other machines on your network that don't have internet access to synchronize their clocks to the NIST time standard. All that needs to be done is to install the ATS software on the internet-shielded machines and have them look at machine that has access to the internet.

The screen shot below is of the ATS server's configuration screen. On this screen you set the URL to the NIST timer server and how often you wish to have the time updated or synchronized. Since this is my time server machine,

I have selected the local server to be active. When you set up the client device, you would enter internal IP address, in the Network Time Server field, of the machine that is running the ATS time server.

The picture below shows the synchronization screen of ATS. Note that is shows both the NIST time as well as the time of the machine's clock. If the synchronization function is turned on, both clocks should track together.
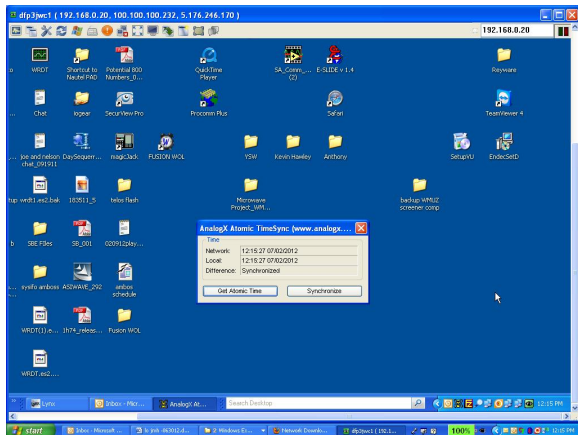
I encourage all of you to play and experiment with this wonder piece of software. I was able to download it from the link below.

http://www.analogx.com/contents/download/Network/ats/Freeware.htm

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

There's not a lot to report on this month from Birmingham. There's no need to get into the minutiae. We've got our CAP-ready Sage ENDEC units installed and, aside from getting dozens of emails from them each day, they seem to be working well. Another project that we've been working on is a rebuild of the dehydrator system for WYDE FM in Cullman, AL. That site needs a LOT of air (6" line at over 1350 feet), and with our pea-soup humidity, the standard "compressor and desiccant chamber" doesn't quite cut it.

I mentioned this in an earlier article. At high pressures, the dew point goes up, meaning that any moisture in the air can easily be condensed into liquid water. Ask any mechanic or construction worker who deals with a compressor: you've got to drain the

Moisture separator operates under high pressure.

tanks on a regular basis or they'll corrode and rupture. We'll use this to our benefit by running most of the system at 100-125 PSI. A standard gas regulator reduces the pressure to the usual 3-5 lbs PSI for the coaxial lines. We then run this low-pressure air through desiccant.

We're using a standard Bosch dual-tank compressor unit from Lowes. We pull from the drain lines at the bottom of the tanks because we *want* the moisture to drain out into the coalescing filter and water separator. The separator has a
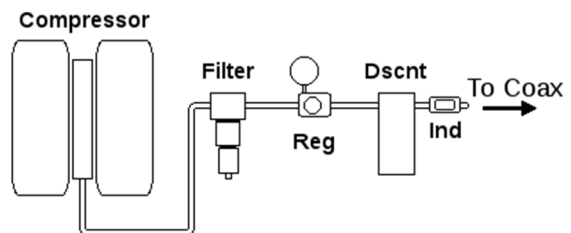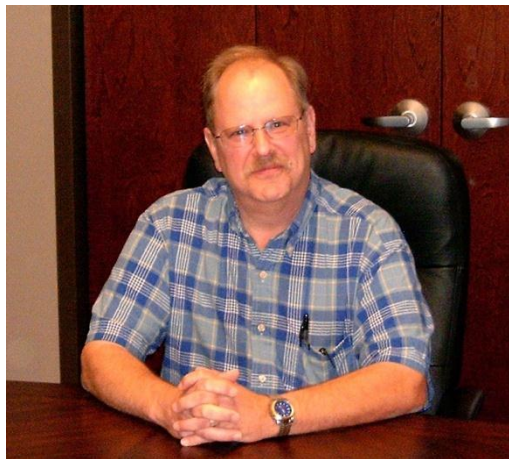

The basic layout of WYDE FM's new dehydrator system.

float-type valve and automatically drains the captured moisture. From the separator, we go to the regulator, and finally, into a desiccant chamber. Immediately

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after the main desiccant chamber is a small indicating chamber (available for $10 at Lowes) that will tell us when the main chamber needs to be regenerated.

This is another example of having to learn more than I ever thought I would. There are several types of desiccant, each with strengths and weaknesses. Lowes carries calcium chloride under the DampRid brand name, which we use in our ATUs at 850AM in Tarrant (and thanks to Bill Agresta for telling us about that one!). It's very inexpensive, but has one big drawback. It's extremely hygroscopic, and will indeed pull moisture from air with a vengeance, but in doing so, it turns into a thick soupy mess. It would quickly clog the drain system on our rig.

Calcium carbonate is another common desiccant, but it has drawbacks as well. On the plus side, it's also relatively inexpensive and is readily available. But we had a Cablewave SPD-10 filled with this stuff when I first took the job here many years ago, and that cured me. CaCO3 not only becomes very warm when wet, the moisture tends to condense, causing a thick, gooey mud to form. This
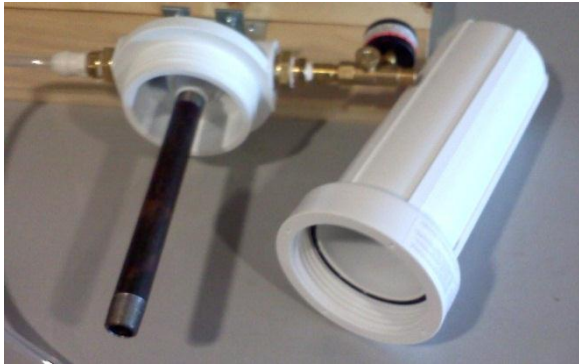
The desiccant chamber is a water filter housing with a threaded pipe.

can actually block the air flow completely.

At the end of the day, we came back to good ol' silica gel. It's more expensive, but well worth it. Grainger carries it, so it's readily available (though they may have to order it; don't wait until you're out!). Silica gel will lower the dew point of your air to -40 degrees, which is plenty dry enough. Best of all, you can easily regenerate it in a standard microwave oven: simply put it in a glass dish and heat it until the indicating pellets turn bright blue again. When it gets to the point that it's taking too long and/or the indicating pellets never turn completely blue, it's time to replace the gel completely.

The desiccant chamber is a standard whole-house water filter assembly filled with the silica gel. After pricing commercial units, I figured we could save money doing it this way. We simply removed the water filter and threaded in a metal pipe. You can get these with a clear housing, but we opted for the less expensive opaque white (another reason for the separate, $10 indicating unit just after the main chamber).

I hope to have complete pictures of the finished and installed project in the next issue.

I Hate Politics

This might sound funny to those of you who know me. I was raised to believe that voting wasn't merely a privilege, but a responsibility. One of my favorite websites is Real Clear Politics (www.realclearpolitics.com), because it provides a balanced spectrum of discussion about current issues, as well as polls from around the country showing the state of various races. I follow elections with the same avidity that some people exercise toward their favorite football or baseball team.

But this doesn't mean that I like politics. I hate how the game is played. Be warned that the remainder of this month's article is essentially a rant. In no particular order…

First, note how everyone waited on pins and needles for the Supreme Court decision on the Affordable Care Act (also known as "Obamacare"). Folks, it shouldn't be this way. The idea that nine unelected officials should have the final say-so over all matters of legislation is completely contrary to the concept of "government of the people, by the people and for the people."

The solution that I'd propose? Anytime the Supreme Court issues a ruling on constitutionality, it immediately heads to the state legislatures for the final say. They'll either uphold or reject the decision.

Next, the budget. You've seen the polls showing that the American people are tired of "partisanship" and gridlock in Washington. Both parties frequently use these polls to declare that the other party should compromise and agree with them (heh), but this is another case of deliberately clouding the issue just to score cheap political points.

Solution: Not only give the President a line-item veto power, each bill in Congress should be read, one page at a time, and all members required to vote on each provision. The way it works now – with intent, malice and aforethought, mind you – is that byzantine and incomprehensible bills are regurgitated from committee and thrown at the members, who then either vote for or against the entire stack of dead tree material.

Congress likes it this way, of course, because it's easier to bury pork in a 1,000-page appropriations bill. It's also a great way to allow speeches and posturing: "I won't vote for this bill because it funds gay biking clubs," and "I DO support this bill because it provides money for much-needed gnarly-widgel research!" This just adds to the polarization.

Again, Congress is quite aware of this. They deliberately arrange things so that, in order to get a new project funded, your Congresscritter must vote for an entire package that may (and probably does) contain a lot of stuff that you don't want. If your 'Critter votes against the package, his/her opponent can make an issue of it in the next election: "You wanted that new road? Well, dunderhead voted AGAINST it! It's time for a change ..." (Sound familiar?)

The American people on the other hand, are required in their daily lives to compromise and actually come up with working solutions on a daily basis. Simply put, we know how bogus this is. In real, ordinary life, if two people disagree, they sit down and work something out. Neither will get everything that they want, but at the end of the day, maybe they can come up with a compromise that both can live with. THIS is the real reason why Congress has near-zero approval ratings. The American people aren't fooled by the posturing.

Finally, the longer I live, the more I've come to believe that the only real solution is going to be for 34 states to call for a Constitutional Convention. Congress will never, ever stop borrowing money or clean up its own messes; we're going to have to force them to do it. My wish list, in no particular order, would include:

- A balanced budget amendment, with exceptions for emergencies and war being declared against a foreign power (and "emergency" would have to be clearly delimited)
- Term limits (I used to be of mixed mind on this, but not anymore)
- Public disclosure of all bills to the public prior to any vote. Simply put, Congress must post the entire text of the bill online and allow the American people to read it. For emergencies, you could allow legislation to be passed with, say, a 2/3 majority vote. But for ordinary business, this rule would apply.

See what I'm saying? This is not rocket science, folks. The real reason why Congress' approval ratings are equivalent to my shoe size is because the American people aren't idiots. Those of us who are forced to live within a budget and to compromise with friends and family members on a daily basis aren't fooled for a minute. We could fix the problem overnight with a few simple steps like these.

That's enough for this time. As Christians, let's never forget that the most important thing that we can do is to *pray* for this nation. The number one thing that we need is a national revival. Until next time!

Catalina Tales
By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! It's been a very exciting month for me as I continue to watch our new transmitter site take shape! I'm glad to report that things have continued to move along very well.

We rented a four-wheel drive tractor and along with our neighbor, Larry Booth, we performed brush clearance on the new site and collected a lot of

debris left over from the previous landowner. The view from the new site is awesome, and it is nice to have a neighbor with whom we get along with so very well. What a change from what I'm so used to on Catalina Island!

On the island side of life, I continue to prepare things for the move and have, in fact, already begun to move several things to the mainland. There

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are certain aspects of the island I will miss very much, but for the overwhelming majority of things, I am extremely glad to see this move happen. I feel it will give KBRT a much better position from the broadcast side of things as well as give me a better quality of life, being that we have much more support and access to resources on the mainland. The funny thing is, with so much happening, I seem to have a hard time sorting each thing out then writing to you about it because it all just seems to be one big blessing and the end to one long and ugly nightmare!

I am very blessed to report that our power situation on the island has been a lot more stable of late than it has been for a very long time. Our

propane-fueled generator is working great again after I decided to stop waiting for our generator maintenance repair person and do the needed maintenance myself, something I still find myself doing on the island more often than not. The building and equipment are holding up fairly well, and the timing of our move seems to be so perfect that I know it is by God's hand.

By the way… we have three towers for sale here on Catalina Island, U-haul em yourself…

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

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

Synchronicity, with the emphasis on "sinking"

This past month saw one of the strangest scenarios in my rather lengthy career. I had two transmitter outages over a hundred miles apart (as the crow walks and carries a spare tire), on June 19, within seconds of each other. First, the brand new WYCA Nautel VS2.5 hybrid; next, the vintage WYRB Nautel FM-5 analog rig went down. In the case of the Beecher transmitter, the outage wasn't quite as disastrous as it was at Kirkland, since Beecher is a lot closer, has a backup rig, and in any event that transmitter didn't go all the way down; however, it has certainly been the toughest nut to crack. Read on.

The analog outage at Kirkland lasted over two and a half hours, since it took that long for me to determine that I couldn't get the rig back up by remote control, then jump onto the toll road at rush hour. I ended up spending over half my trip poking along at 45 MPH, which is enough to drive a saint mad, especially considering that, in those construction zones, 45 MPH is both the minimum *and* the maximum speed allowed; beginning July 1, a $375 ticket awaits anyone who isn't going at exactly that speed and that speed only within any construction zone, whether or not workers are present. Cameras will be there to record your infraction, and the ticket will be mailed to you

forthwith; no police officer will call, or even haul you off to jail. Second offenses mean license suspension. Welcome to life in statist Illinois; but I digress...

When I arrived at Kirkland, it took me all of two minutes to figure it out. The exciter, a BE Fxi-60 configured as analog only, was no longer putting out the 20 watts that the Nautel main rig required. It wasn't putting out zero, either, but rather thirteen watts, two below the minimum drive requirement for the Nautel 5K. Close, but no cigar.

Power raise and lower functions are both front panel controls on the FXi-60/250, but it also can be accomplished with the remote control, via the J3, 25-pin connector on the back. But it had simply never been hooked up because, in nine years of operation (these FX-series exciters were obtained as part of the HD Radio upgrade), we never needed it. Well, now we know we do.

On my next trip out, to correct a couple of other glitches caused by the big storms we'd had, I added to our remote control the ability to both read and control the exciter output. This took some time, as Murphy made the trip with me (on a Sunday – he *never* takes a day off) and I ended up taking a side trip to Radio Shack when the grounding pin #25 on the D-sub connector broke off. But, now that it's done, there is remote control over one more thing

which could keep us off the air for three hours.

Meanwhile, at Beecher, the HD had gone down. I discovered that one when I was near home on my way back from Kirkland. Since the analog was up and, at that hour, I was to the point where I wasn't, I waited until next morning to check it out. I discovered that there was no access to the AUI – no, not GUI; it's the way the new Nautel transmitters are controlled and read via computer.

The Nautel CSD and I quickly got together to deal with this. For the record, Joey Kloss up at Nautel is a real rock star in dealing with these things. We immediately found out that the IP inputs to both the main transmitter box and the Exgine (exciter) were dead. We couldn't ping them at all. This was despite the fact that we'd gone to the effort of putting ferrite cores on all the wiring to that rig. The AUI software was also corrupted. This glitch must have been sizable. The importer and exporter were just fine.

Joey emailed a new copy of the AUI software, which James and I loaded into a memory stick and stuck it to the VS2.5 transmitter box. That worked to fix the AUI, but the IP ports were still dead. We had no choice but to replace the interface card on the main transmitter, and the entire Exgine box.

It took only a day for those things to arrive from Nautel and be installed. It wasn't that difficult to replace the interconnect card, and it would have been easier if we'd read the instruction book on how to get the AES XLR connector out beforehand, but that was a small matter, and in short order it was done and the boxes installed... and then we had to configure the transmitter all over again. There are really no written instructions for that, so we went through all the menus, making changes as we saw the need, but it still wouldn't work right. We could get no more than 800 watts output, and we needed double that.

At that point, Cris stepped in, got the factory on the horn, and then instructed us to get the entire transmitter up to Lansing or Hammond so that Nautel

could get in through the Internet and finish the configuration. James and I went to Beecher to do it, but then James got inspired and I got my laptop out. Using James' Android phone as a Wi-Fi hotspot in tether mode, we got the laptop on the Internet, then from there, we VNCed our way into the system at Hammond. We set up the transmitter and its VNC to new IP addresses on our normal LAN/WAN, changed entry port numbers, and voila! We were able to get in via the ever-so-slow LANLink just fine. We couldn't believe it. By that time though, it was near midnight at Nautel, so we put off the finish until Monday (they day this is written), which is Canada Day. Plant closed. Aargh! Well, by the time you read this, the VS2.5 should be back running just fine, and all should be right with the world. That is, until the next storm hits.

NanoBridge as an ISDN replacement

Our ISDN at Burnham has failed for the last time. We're ordering it disconnected as you read this. We now have better... our Ubiquiti NanoBridge M5. Originally installed last year for the remote control and PAD data, its bandwidth capability was way beyond that, so we simply added to the NanoBridge two available APT Worldcast Horizon codecs which were a part our new WSRB Trango STL. All it took was to move one Horizon from Lansing to Burnham and switch the audio feed at the studio end to Power 92. After James did the proper audio configuration within the Horizons, the system worked like a hose.

This all started with the gradual failure of one of our Moseley StarLink audio cards at the studio end, which resulted in a rising level of digital noise in WPWX-HD2's audio. We couldn't swap STL transmitters on the fly since we have no instant changeover relay setup. The ISDN was supposed to make this unnecessary. But the circuit never worked when we needed it, so AT&T just lost an account, and we couldn't be happier with both the new Nano-Bridge audio setup, and with our vastly improved HD2 sound.

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

With the ongoing La Niña and El Niño cycle, the Pacific Northwest is currently in a cool and wet phase. Of course it's a given that during the first weeks of June the Portland Rose Festival will be wet and rainy proving yet again Murphy's Law. No one is surprised by wet weather… after all the OSU and U of O mascots are the Beavers and Ducks.

For calibration, please recall that in Portland an inch of rain is a mist. This year has mostly been cold and wet nights punctuated by the last deluge from the storm drain backing up with the puddle nearly entering the door. So… one would think weather would suppress the creepy crawlers (the two-legged variety) in the night. One would think wrong, as the KKPZ cable fence became the midnight scrap store while the fence cable grew legs. It's replaced now with the U-bolts welded to prevent easy disassembly. Honestly, defensive measures such as welding cable clamps will at best slow down theft. The real solution must be found with enforcement.

The best example is the theft of the bronze statue of Sacagawea from an Oregon park at the coast. The $25,000 statue was broken up for scrap. The Portland scrap dealer notified police but the thief took off before officers arrived. Later, the thief took the statue to Bend, Oregon and this time the police arrested the subject who was later convicted and sentenced to 30 days in jail.

Two years ago, Oregonians had a solution to the problem with a ballot measure setting minimum sentencing requirements for property crimes. The legislature reacted by placing its own lax measure on the ballot. That measure also canceled the citizen initiated measure if it passed. The next legislature then canceled its own measure. With token enforcement, I don't expect any improvement in the property theft environment. For now, defensive measures will have to suffice.

Earlier, I mentioned the cool wet Northwest weather. I realize when we are wet other parts of the country are hot and dry, the Colorado fires being the current example. An Oregon air transport is an excellent fire fighting tool to supplement the aging air tanker fleet. Evergreen has converted a 747 cargo aircraft to an air tanker. The largest existing fleet tanker is capable of providing a suppression line of a few thousand feet. The 747 tanker has the ability to lay multiple drops totaling 25,000 feet.

Right at my deadline for this column I found a problem with the new ENDEC IPAWS poller. Over the years I have learned that being a beta tester can have advantages. However, it's usually best not to install a new software version on the first day of release. Wide distribution is bound to find one or more small problems that need attention.

I encountered an ENDEC problem in which the IPAWS poller goes offline and stops polling the IPAWS server. When logging in to the ENDEC home page, the status will be listed as CAP Status: Offline.

Sage is researching the problem, which may be related to a malformed response to a poll. In the interim, Sage has a fix that will clear and restart the poller. If you have the problem, this fix is the solution. If not, you are good to go. So far the patch has eliminated the problem for us here in Portland.

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

It seems if it isn't one thing it's another in regards to that Massey Ferguson tractor we have. We had it taken out to KLVZ in Brighton so Keith could get a handle on the growth. He ran over something out there and one of the big back tires went flat. We ended up having a tire service company go out to the site to fix it.

With the drought conditions and daily red flag fire danger here in Colorado, mowing has become top priority at all three sites we own. Unless you are living in a hole somewhere you know about the wildfires that have destroyed 600+ homes and killed three people of late. It has been so dry that any little thing could start a blaze. Keith has begun making fire barriers around the tower base fences and buildings so as to keep a wildfire from damaging too much of our stuff if one were to come through one of the sites.

While we haven't had any equipment problems at the KLVZ site, we did have two air conditioner failures during a 100+ degree heat wave. In the first failure, we discovered that a repair done last year was done improperly, and the blower motor was wired up wrong. The second we never did figure out – a power cycle reset cleared the issue. Air conditioners are really getting a workout at the transmitter sites this summer.

We had some weird issues at KLDC last month. There were several days of thunderstorms (that didn't produce much rain). Normally, storms over Denver means KLDC will be off air. This time around, though, it did take us off the air but the transmitter would not reset. I logged on to AutoPilot and turned it off. Nothing happened. I decided to call directly into the Burk ARC-16 and turn it off that way, and still nothing happened. The only way to turn the main transmitter off was to switch the antenna to the aux transmitter.

This happened about four times over the course of a weekend and we still have no idea what happened. I would just switch it to the aux and leave it until the storms passed. I went to the site and found that the transmitter operated perfectly from the remote control. We had some more storms near the end of the month and everything worked as it should then, too. I am still baffled by what happened, but I guess I did learn something.

Thankfully, I did find that the station was more stable during storms when the aux transmitter was on. For some odd reason, the Nautel ND-1 is much more sensitive to static discharges and guy snaps than the P400 auxiliary.

Finally, we had to reset the Trango Apex 11 out at KLTT twice last month. The first time, we lost connectivity between the studio and site and had to go out to the site to log into the management port of the Apex. A reboot from the web interface got things running again. But then a few days later, another problem cropped up. While the link to the site was intact, we couldn't see anything at the site from the studio. Back out to the site I went, and this time I power-cycled the whole tower. That got things back up, and they have been fine since. It was probably a lightning strike that scrambled first the Apex and then the Ethernet switch on the tower.

Other than those things, it was a fairly slow month in Denver, something that was needed. So I do apologize for this abbreviated summary of the month.

Until next time… that's all folks!!!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

Keeping an Eye on the Network

One thing I enjoy doing is downloading and testing trial versions of various software applications. Most recently, I've been playing around with OpManager. OpManager is a network monitoring software that provides a good overview of the different devices on your network including printers and routers. Unlike other such applications that I've tried, this system includes an automatic network discovery engine which is definitely a plus.

Once configured, you can quickly lay out the devices within your network on a general business view, with each icon corresponding with a specific device. The software also allows for a Layer2 Topology Map which, in my opinion, is the easiest method for documenting the network and the associated connections.

If you prefer to view the network devices in list form, OpManager allows for that as well. All of the network devices can be displayed in a list and sorted by IP address, device type, status or other filters. Selecting the desired device opens a snapshot view which includes general monitoring data as well

as editable device details.

One feature that I feel can be extremely helpful in quickly diagnosing issues is the Network Availability service. It continuously monitors the entire network for uptime and network availability.

The software actually pings the devices being monitored every two minutes. Devices deemed unresponsive will be tagged with an attention tag, warning tag or critical tag depending on how many unanswered pings have been sent. During my testing several general office computers were tagged as critical, but were simply a result of being powered down for the evening. Where I find this feature helpful is in keeping an eye on our audio servers and streaming encoders and determining whether an outage is isolated to the specific machine or is being caused by a network switch.

Although my time spent with OpManager has been limited, I've been impressed with what it offers. The dashboard application runs within a web browser which allows for cross-platform viewing. The Router and WAN monitoring also provides critical information for issue detection and troubleshooting, as well as bandwidth optimization and allocation. With SNMP enabled on each device, you can further monitor CPU and Memory utilization remotely.

The only downside I've discovered with using OpManager is the large resource load it presents on the machine it operates on. This application is definitely best suited for a server machine or other non-user type computer. The software is constantly monitoring the network and will ping the network per the configured intervals, so it definitely slows things down quite a bit.

There are numerous other network monitoring tools available today, but not all have the features that OpManager offers. Although the trial version is free, OpManager starts at roughly $2000 for a 50 device license and can cost as much as $99,995 for extremely large WANs with up to 5000 devices to be monitored.

Clogged Pipes

With the number of IP-based tools we use every day increasing at a staggering rate, the amount of bandwidth necessary obviously becomes critical to

ensure everyone gets the information they need and when they need it. It's a topic I've touched on before and that will continue to be on the radar for some time to come especially as cloud-based solutions increase in number. I constantly hear about more and more companies moving to the cloud for services and applications critical to their daily operations. Obviously there would need to be a considerable benefit in doing so, aside from the "everyone is doing it" mentality. The biggest concern, which unfortunately isn't always addressed or investigated during the decision making process, is whether network latency or overall bandwidth will be an issue. This has also been a hot button topic as thoughts and opinions relating to IP based radio go back and forth. Whether it's mobile or not, bandwidth capacity continues to be and will be a problem for some time to come.

According to Cisco's Visual Networking Index (VNI) covering 2011 through 2016, it is predicted that monthly global mobile data traffic will surpass 10 exabytes in 2016. That's one quintillion bytes. In terms that most computer users can relate to today, we go from gigabytes to terabytes to petabytes before reaching exabyte. Yes, that's a ton of data.

Again, according to Cisco, global mobile data traffic grew 2.3-fold in 2011, more than doubling for the fourth year in a row. This figure actually surpassed previous predictions and it is expected that we'll see increased growth beyond predicted numbers in 2012. All of those smart phones being sold each day are putting a huge strain on the

infrastructure with no clear solution in sight. Needless to say, providers will need to keep adding capacity and infrastructure and we will assuredly see the cost of these upgrades in the form of increasing monthly service charges. The root problem isn't only the number of devices in circulation, but it's also the data connection protocols used by these mobile devices. According to the Cisco VNI, 4G connections generated 29 times more traffic in 2011 than non-4G connections.

One very interesting piece of information I found buried in the VNI was that Android has most likely surpassed the iPhone in levels of data use in 2012. The report states that at the end of 2011, Android was equal to iPhone in data consumption within the US and Western Europe. Given past statistics and the somewhat consistent growth enjoyed by the Android platform, it's almost certain that it has already pushed beyond the iPhone.

There is much more information within Cisco's Visual Networking Index that I didn't even touch on and that you may find interesting. Overall, it's quite obvious that network and data usage has exploded with no tapering in sight. Consumers irritated with latency on one device, make the leap to the next protocol in hopes of faster data. This leads to more data being pushed through the pipes, putting more strain on an already strained infrastructure. Around and around we keep going…albeit a bit slower each time around.
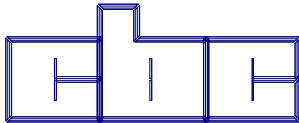
…until next month!

KBRT • Avalon - Los Angeles, CA
740 kHz, 10 kW-D, DA
KCBC • Manteca - San Francisco, CA
770 kHz, 50 kW-D/1 kW-N, DA-1
KJSL • St. Louis, MO
630 kHz, 5 kW-U, DA-2
KKPZ • Portland, OR
1330 kHz, 5 kW-U, DA-1
KLZ • Denver, CO
560 kHz, 5 kW-U, DA-1
KLDC • Brighton - Denver, CO
1220 kHz, 660 W-D/11 W-N, ND
KLTT • Commerce City - Denver, CO
670 kHz, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Denver, CO
810 kHz, 2.2 kW-D/430 W-N, DA-2
KSTL • St. Louis, MO
690 kHz, 1 kW-D/18 W-N, ND
WDCX • Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2
WDCX • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT

WEXL • Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D
WLGZ-FM • Webster - Rochester, NY
102.7 MHz, 6 kW/100m AAT
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT
WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT
WYRB • Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT
WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND
WYDE-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT
WXJC • Birmingham, AL
850 kHz, 50 kW-D/1 kW-N, DA-2
WXJC-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT