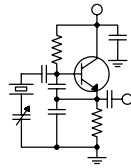


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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HD Love/Hate

In recent months, I have developed what can only be termed a “love-hate” relationship with HD Radio.

I love the way it sounds and the way it brings AM to life. We recently had a failure of both the main and spare HD Radio exciter at KLZ in Denver. The station airs a really good Contemporary Christian Music format that sounds great in HD. While both exciters were down for the count and back at the factory being repaired, I found that my enthusiasm for KLZ’s music format (and the amount of time I spent listening to it) waned considerably. What a relief it was when the digital carriers came back! Does this mean that KLZ sounds bad in analog? Hardly. It simply means that the digital mode sounds so good that I don’t want to ever go back.

Another local station that I listen to frequently is Clear Channel’s KOA on 850 kHz. For years they were transmitting in HD Radio, and boy did it sound great, even with a talk format. It’s amazing how much more clear speech is when all the highs and harmonic components are restored to the audio. I love listening to baseball games on KOA in HD Radio. But for the past couple of months, KOA has been in analog only. The word I got is that their HD exciter failed. Perhaps it was unrepairable and they have opted to leave the HD off for the time being. Whatever the case, I don’t listen to KOA much anymore.

I love the *possibilities* of HD Radio, the potential that it has as a medium. Not only does it

bring AM to life, it has the potential to double or even triple the number of program channels (and therefore inventory) for FM stations. What else in the history of broadcast radio has offered such gains?

And these aren’t bad sounding artifact-laden audio streams, either. The multicast streams offer excellent quality and are very listenable.

I am absolutely *spoiled* by program associated data (PAD). As I drive down the road or sit in my office or home listening, I constantly find myself glancing at the PAD scroll to see who that artist is or what

the name of that song is. During the summer months, I spend most weekends in the mountains, and up there, the radio choices are essentially one, a 5 kW C&W station on 930 kHz that does not transmit an HD signal. I frequently find myself glancing at the radio display and finding to my disappointment that there is no title/artist information.

As I read the trade press about traffic data and other ancillary applications that HD Radio has, I am thrilled. While the amount of available bandwidth is limited, the *possibilities* are not. There is so much we can do with this new medium. It has, in so many ways, given us both the means and the opportunity to reinvent ourselves and to remain relevant in this fast-changing world.

At the same time, there are a lot of things about HD Radio that I really dislike. Perhaps hate is too strong a word, but it’s part of the cliché, so I’ll stick with it.

I hate that HD Radio has become so divisive. There are proponents, mostly among large-



market broadcasters, who see the potential and recognize that the egg must come before the chicken. These folks saw the potential a long time ago and invested. Crawford Broadcasting Company is among that group. We *still* see the potential. But there are antagonists as well. It's hard to define this group because it is not cohesive. Certainly it includes those who have received interference from HD stations, but it also includes those who have no dog in the fight whatsoever, reminding me of Groucho Marx's character in "Horsefeathers" – "*Whatever it is, I'm against it!*" he sang, as do many of HD Radio's opponents.

I hate it that consumer demand/acceptance has been so slow. Compared to FM, FM stereo and color television, HD Radio is on the "fast track," but we live in a different world today where consumer acceptance must be immediate and strong or a new technology/medium is considered to be a failure. We – radio – have not done a great job of promoting HD Radio. Sure, we run on-air promotions and mention HD Radio in our liners and IDs, but consumer awareness remains relatively low. We have *not* sold it as *indispensable*.

I hate it that first and second generation HD Radio transmission equipment has been so *unreliable*. I mentioned above that both the main and spare HD exciters failed at KLZ. That's not unusual. It seems that once or twice a month, I read in a report from our market chief engineers that one of their HD exciters has failed, frozen or locked-up and had to be restarted. We have devoted a lot of engineering brainpower over the past five years to providing backups, bypasses and work-arounds for such situations – because they happen so often!

I hate it that the unreliability of so many HD Radio components and so much of the station infrastructure creates *dissatisfaction* on the part of the consumer. As I scan the dial around Denver and other markets, I get aggravated when I find that the PAD on one station isn't working or it's stuck looping the title/artist info for a song that played three hours ago (or maybe yesterday) and no one at the station has noticed. It aggravates me when HD-2 and HD-3 stations come and go – multicast streams that were there yesterday are gone today, further compounding consumer satisfaction with the HD-R medium.

Finally, I hate it that some HD Radio features are evidently reserved for big groups. One that I will mention is iTunes tagging. We signed the agreements to participate in this *last September*. Despite a huge volume of back-and-forth emails and phone calls, we *still* do not have the means to look up the metadata ID number of even one song so that we

can transmit that data when the song plays. I read in the trade press about other groups, all of them larger than ours, going great guns with iTunes tagging, but we can't get the time of day from Apple, and iBiquity hasn't been much help, either.

That's far from all of it; I could go on and on. Will HD succeed? Will it fail? It's impossible to say at this point. Are the proponents right? Are the antagonists right? There is undoubtedly truth on both sides. Unfortunately, it's left up to individual broadcasters to sort it all out, and in the meantime, things stagnate.

So much of what I hate about HD Radio is beyond my control, and that stuff I have to leave to others to deal with. But some of it is squarely in my court, and we will do everything in our power to make those facets of HD Radio the very best that they can be. We'll make sure that our HD signals are reliable, that the audio is time-aligned, that the PAD is working properly on main and multicast channels. In short, we will continue to focus on *the listener experience*, making it the very best it can be all the time. No inconsistencies, no aggravation factors. That, I believe, will go a long way toward making it succeed.

Catch-22

We have a barn at the KLZ transmitter site. It's an old steel barn with the name tag "Butler" displayed at the eave (a "Butler building"). It includes sliding double doors front and back that really make it a "drive-through" structure, very handy for getting tractor, trailer, mowers, etc. in and out. We didn't build the barn; it was there when we bought the station 15 years ago, filled with junk and the former chief engineer's household goods.

In the old days, the barn was no doubt used to store tractor, brush hog and other maintenance implements. Over the years, it fell into disuse (no telling what happened to those old implements), but we have resurrected it. For the past five or six years, we have used it to store our trailer, riding mower and the like, and we use it extensively today. In fact, we couldn't live without it (we could, but stored outside, our stuff would no doubt grow legs and disappear).

But our barn has a problem – its location. Unlike the KLZ transmitter building, which is located deep into the property, hundreds of feet from the road, the barn is located very close to the street on which the site is situated. And as such (and because it is so big), it provides an irresistible "canvas" for local graffiti artists. Over the past seven or eight years, the place has been "tagged" on virtually every exposed surface, including the roof!

When this first started happening, we called the local sheriff, who brought out work gangs of juvenile offenders to paint over the fresh graffiti. But that all came to a halt when the ACLU got wind of this “cruel and unusual punishment” being inflicted on juvenile hoodlums. So for years, we just let it go; there was no way to fight it.

Then late last month, we got a notice from Adams County Code Enforcement ordering us to comply with the ordinance that requires property owners to immediately remove graffiti from structures and improvements. If we don’t comply within ten days, we’ll face a fine of \$100 per day and someone (who?) could possibly go to jail. Well, that’s just lovely. So we got a couple of bids to paint the barn, no small job (the roof has to be painted, too). The low bid was \$1,400.

Now we could just call the painter and tell him to go for it, but it doesn’t take a rocket scientist to figure out what will happen. By painting the barn, we’ll simply provide the local hoods with a fresh,

new canvas. It won’t take a week for them to tag it up again. It might not even take a day.

Personally, I think it’s a racket. The sheriff can’t seem to do anything to stop the vandalism. The taggers paint up the barn and we have to paint over it immediately. When we don’t, it’s a \$100 per day fine. Who wins? The taggers, certainly. It’s like we’re providing them with a free billboard. Painting contractors? Sure. Somebody has to paint over all that garbage, and they don’t do it free. The county? You bet. Keep those \$100 fines coming. The property owners? Not a chance. We’re the big *losers* here. In fact, we can’t win. We have to comply with the law. It’s the crime victim that’s being punished here, and that’s just wrong.

It seems that the only way to protect this barn from taggers and keep us from having to pay \$1,400 several times a year to stay out of dutch with the county is to surround it with a security fence, turning it into a prison yard. Stay tuned... we’ll let you know how it turns out.

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

Hello to all from Western New York!

As I sit writing this article, I am coming off a much needed week-long vacation. Since the first of the year, it seems as if I cannot get ahead in my engineering duties. Just about the time I think things are on an even keel, three more situations pop up, and then three more and then yet another. It’s sometimes hard to keep focused when dodging bullets from all directions. Those market chiefs that have assistants can delegate job duties, which I can only assume will help relieve some of the pressure, but those of you who, like myself, work alone, can quickly become overwhelmed and buried in your work.

What works for me when I get in these situations is to list all my priorities and arrange them in order of importance. Those that can impede on-air performance always command first attention, along with any situation that puts the station in violation of

FCC rules and regulations. All other complaints are added to the list and chipped away at as time allows.

By taking a week off, it gives me time to recharge the bodily batteries, and return to the workforce with a rested body and refreshed mind. Hopefully, nothing drastic happened while I was away...



One of my favorite articles in the trade magazines is the “Worst I’ve Ever Seen” that appears bi-monthly in *Radio Guide*, published by Media Magazines, Inc. Before joining the CBC engineering department, I worked as a contract engineer for S&B Communications for eleven years. There was never a job too large or too far that we wouldn’t do. In traveling to different areas of the country, we saw things that you couldn’t even imagine, like

the station that was having trouble staying on the air. We went to the transmitter site only to find that the engineer had an automobile jumper cable attached

from the output of the transmitter to the input of the antenna switch! Now, talk about impedance problems! Their VSWR was bouncing around so much they could have won on *Dancing with the Stars*!

I have seen some pretty weird grounding schemes, and wiring that looked like it was done by a five year old. In all fairness, the majority of these situations were caused by contract engineers that wanted to do the job correctly but the station owner/manager didn't want to spend the money to do the job right. I know I have walked away from several jobs where I was asked to, "Patch up the problem, and we will fix it properly later." The *properly later* almost rarely ever happens. Then when someone else comes along, your "patch job" could very well end up in "The Worst I've Ever Seen."

WDCX – Buffalo

The WDCX transmitter building project is now complete. Just before leaving on vacation, I wired the building's alarm panel into the Burk remote control. The alarm panel will provide contact closures for the fire alarm, high/low temperature and open door. I wired these into the status inputs of the Burk, and programmed it to notify me via the modem if any of these status indications change. I have one other security issue to address, and that is the installation of a couple of security cameras, one outside the building and one inside. Weather permitting, I hope to have this done by mid-month. Also, the foundation needs to be back-filled to keep the rain runoff from washing out the stone underneath the concrete pad foundation. By not back-filling, the concrete could shift and crack due to the stone and earth being washed away. There is a good 10 to 12 inch deep ditch around the entire perimeter of the foundation, with some areas being nearly two feet wide.

Speaking of the Burk remote control, I recently used the AutoLoad program to label the additional alarm status inputs. I made the changes and uploaded them into the Burk. Once I got back to the studio, I noticed that the studio unit and AutoPilot were not getting a signal from the transmitter unit. I went back to the transmitter to investigate the cause of the problem. After about an hour of troubleshooting the Burk and the Moseley LanLink, I was not able to rectify the problem. As it was getting late into the evening, I decided to pick it back up first thing the next morning. I called the studio to let them know that they had to call the remote control to get

their readings. While in the shower, several hours later, it dawned on me why the communications link had gone down. The AutoLoad software defaults the baud rate to 9600 baud. The Burk will only handle 1200 baud rate with v.5.62. After my shower, I went back out to the transmitter and changed the baud rate, called the studio to insure that they were in fact receiving readings. Sometimes it's the simplest things that cause you the most grief.

WLGZ / WRCI – Rochester

Recently, after a severe thunderstorm rolled through the area, the board operator called to report that the readings were considerably lower on the BE HD-R transmitter. I called into the remote and found that the transmitter's output was less than half of the normal output. I suspected that one of the RF modules had failed, but in order to save the cost of driving the 190 miles roundtrip, I asked Earl Schillinger to drive over to the transmitter site to be my eyes. He confirmed what I had suspected, one of the modules had indeed failed.

I immediately ordered a replacement RF module from BE, and after it arrived, I took off to make the swap. When I got to the transmitter building, the first thing I noticed was that the air conditioning was not working at all. The temperature inside the building was almost 130 degrees! I called our HVAC contractor and they agreed to come right over to fix the problem. They found that the condenser coils were clogged up due to cottonwood, which is a fibrous seed that is wind distributed from the cottonwood trees in the area. When the cottonwood flies in the late spring, it looks like it is snowing, and this stuff really clogs up the coils. It took the repairman several hours to get the system cleaned out and working again. To keep additional heat from building up in the transmitter building while he was working on the a/c, I shut down the digital transmitter. When I brought it back up, the suspected defective module began working again! I am hanging on to the replacement module for another week to insure that it does not fail again. Just about the time I send the replacement module back to BE, the original one will fail again. Murphy's Law!

That about wraps up another month here in the Northeast. Until we meet again here in the pages of *The Local Oscillator*, be well, and happy engineering!

The Motown Update

By
Tom Gardull, CBRE
Chief Engineer, CBC–Detroit

There are still echoes around of how radio was. This month reminded me of what I used to call “instant remotes.” We got a two-day notice that if the Red Wings won their hockey championship, a downtown Detroit church, St Johns Episcopal, situated directly on the parade route, wanted us to broadcast from their front steps while 100,000 people passed by. The Red Wings won their Stanley Cup, so our morning show was going to be live from Woodward Avenue. I grabbed our VHF Marti transmitter and headed downtown. The church steps were on the side of the building towards the WMUZ tower, and there were no obstructions. The studio reported received audio as good as if we were in the studio. Regrettably, the ten miles of distance from the FM transmitter site and the half-mile proximity to a class B FM public station tower prevented reception of our SCA, so monitoring ourselves was going to be a problem in this age of delayed transmitted audio.

There were no regular telephone lines close by for a Comrex connection, but the church did have a telephone on its electronic PBX at hand. I soldered wires to a handset earpiece of one of our office telephones and temporarily switched handsets, minus the mouthpiece, at the church. Our console fed mix-minus program with IFB, albeit telephone line quality audio, into the Hosts headphones from the handset. Headphone quality was not great, but they could hear what was happening at the station, take phone calls, and converse with the board-op.

We did want our music heard at the site, so we decided to use our 48-second delayed main channel air signal for the nearby speakers. We found that delayed audio was not distracting to the crowd passing by who never really saw the hosts’ mouths moving out-of-sync with the sound because of how we placed the speaker stands. One great benefit of

delay was that I never had to worry about any feedback. At other remotes, I have a local microphone feed in real time to the local PA, but that was not needed here.

We had to arrive by 5:00 AM to set up the remote, and the church custodian opened everything for us. The pastor was worried that the custodian might be late and wanted all to be ready for us. The church has an extensive video monitoring system for safety, so the pastor accessed their monitors from home via the Internet. He watched us arrive and set up, and

was assured all was well.

The church and its pastor were very kind and accommodating. They have invited us back to broadcast at the big Thanksgiving Day parade in November. The church is strategically placed around the corner from the parade staging area. This is a great location. We have a great relationship with the pastor and the church.

Many times in the old days, we would work with few days notice to cover an event, parade, press conference, or sport championship game. Life was simpler. I could setup a Marti transmitter and antenna, install a single microphone, and the host would bring his own Walkman. I had a radio scanner close by listening to our two-way frequency for talkback from the studio. Stations would do at least one remote a week, not counting all the sports events. This Red Wing event was almost like those days. As a comparison, the same week as our parade broadcast, we set in motion our next remote which will be originated by ISDN. We will need a month lead-time to arrange, use more equipment, and wire a more complex sound system. Of course, we have the benefits of better audio in both directions from inside a far-away arena where a Marti would never work nor could we hear our main FM signal, delayed or not.



News From The South

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

A New Shelter For WDJC

As promised last month, here are some pictures of the new WDJC transmitter building at Red Mountain. They're taken from near the entrance. One looks left toward the Continental aux, the signal processing, STLs and the HD transmitter. The other looks the other way toward the BE main transmitter and the dummy load. The third figure shows how the fence was "cut in" around the outside of the building. We didn't want to run the fence around that big exhaust hood, and besides, we saved some money on fencing that way.

WDJC's Omnia6.EX is at the factory being repaired, so we're using our older Omnia FM on the analog and a Broadcast Warehouse unit on the HD.



Aux transmitter, digital transmitter and rack equipment

Not all of the STLs are shown, but as mentioned in previous issues, studio-to-transmitter links for 101.1 in Cullman, 850 AM in Tarrant and 92.5 FM in Pumpkin Center are all relayed from this site. The primary feeds from the studios arrive via a Harris

Intraplex on an Aurora spread-spectrum T1 link; we have a backup Moseley DSP-6000 system on a 950 MHz STL.

A lot of revenue depends on those two racks, so we're giving them a lot of attention. The transfer switch for the generator will be the only thing that remains in the old building when we're done. Everything else will be in the new one, in a sealed building, away from vermin, humidity and dust. We're in the process of adding some automatic hot-switching on the STLs to ensure that

everyone stays on the air.

This is my first experience with a Thermobond shelter, and I'm happy with it. The fit and finish are excellent and the workmanship is as good as any I've seen in a prefab. We only had one



BE main transmitter and dummy load

problem – a misfired TVSS blew a module – and our sales rep, Doug Olson, immediately sent a replacement. We ordered the building with all electrical in place, a ladder rack across the ceiling and an emergency exhaust system in the event that the 10 ton HVAC system (two 5-ton units) should fail.

When you're doing a project like this, you want to avoid "well, duh!" moments if you can. Years ago, when we did the new building for WXJC in



Tarrant, we put the phasor to the left and the transmitters to the right, in a single file, with the equipment racks in the middle. That looked great and everything fit perfectly. Then we installed the PI-1900 antenna monitor in the racks... and discovered that the display panel swings out the wrong way. To this day, I sigh a little when adjusting that phasor: we have to tweak, then step back and to the right to see the result on the 1900. Not a big deal, of course, but I wanted to avoid that type of thing in this project.

On a long, relatively narrow building, you're basically limited to putting the transmitters and racks in a single file. We had enough room in this one to put them at angles, one to each side of the door facing the entrance, but decided that wouldn't be an efficient use of space. Instead, we just left a 3-foot gap between the racks and the main transmitter so that we wouldn't have to walk all the way around to get to the back of the room, as we do at our other sites.

If you've never lived in the deep South, trust me, you don't know what humidity is. You just think you do. From April through October, every air conditioner in the region doesn't just drip, it POURS water. We have to recharge the desiccant in our dehydrators at least once a week, and more often in mid-summer. Just opening the door at a transmitter site can cause instant condensation on nearby equipment; we have to watch for that. Simply put, humidity is a real problem here. The only place that might be worse would be the coast, where a corrosive salt spray is added to the mix.

Another important point is that, when it's really humid, an air conditioner can't stay ahead of the moisture unless *all* air is recycled over and again (i.e., it's a completely sealed system). At our home, for example, we have a 5% outside air intake to

prevent a buildup of radon. You wouldn't think that would make a difference, but I grabbed a bottle from the fridge a while ago and almost dropped it. Even though the AC has been running without a break all day, the glass instantly became damp and slick. If you want another example, when I go into WDJC's sealed building and prop the door open to bring in equipment, water will start pouring from the HVAC units within a minute or two. It's unbelievable.

After a lot of discussion with Cris, we decided to go with a completely "sealed" system at WDJC. We ordered the building with pre-cut vent holes for the transmitter exhaust in case we decided to go that way, but thus far, I'm delighted. Allowing the transmitter to exhaust straight into the room obviously has a downside: the HVAC has to run hard all of the time. But the upside is just as obvious, especially here in the steamy South: you don't get the corrosion and condensation. The results here have been so encouraging that we're taking a hard look at converting our other 100kW FM, WYDE in Cullman, to a sealed environment.

The Listener Experience and Public Service

Last night (Wednesday the 25th), I was starting on this month's article when a severe thunderstorm rocked and rolled through, uprooting trees and scaring our poor cats half to death. The power went out, so Sandy and I sat around a candle and chatted until bedtime. Things were calm for a while, then the wind picked up as another storm rolled through. I grabbed a portable radio. We didn't want a tornado sneaking up on us.

As I was doing that, my mind went back to how well our stations handled hurricanes Ivan and Katrina. We literally worked around the clock, providing information and helping evacuees find shelter – sometimes live on the air. We'd get a call from a family looking for somewhere to stay the night and the next caller would offer a room or two. It was the most amazing thing I'd ever been part of. Our job as engineers, of course, was to keep things on air and we did. But the air staff did their jobs as well and I was very proud of what we accomplished together.

I've been reading a lot of opinion in the trades from industry pundits about how radio can remain competitive in the 21st century. Some of it I agree with ... and some of it I disagree with strongly. For example, one fellow with the Consumer Electronics Association said that, in the digital age, radio should essentially just become another download provider. Now, that opened my eyes to the attitude of the equipment manufacturers, and that was unsettling enough. They're obviously focused on

digital content delivery, period, and old-fashioned stuff like radio just doesn't excite them.

But that's an aside. The fact is, if we should take his advice, we're finished as an industry. We're toast.

You don't compete with someone by imitating him. You do so by finding out what your strengths are, what his weaknesses are and then formulating a plan that takes advantage of both. You tell the customer why he or she should use you instead of someone else. If we try to compete with Web and direct broadcast satellite on bulk music delivery, we're going to die and desiccate. They can do that better than we can, no matter how we tweak even the most advanced next-generation HD-R system.

Radio's strengths have always been rooted in its ability to reach a local, targeted group with what it wants to hear. Many broadcasters have lost sight of that and have paid for it. Some will continue to do so. For example, one large group recently reported a huge loss in its last quarter ... and responded by slashing air staff and going with canned satellite formats. They will continue to decline until they get their minds right. Watch and see.

Most listeners don't just want music. If that was the case, the 8-track tape players should have killed us when it first appeared in autos. In fact, we've made it through that, the cassette and the CD ... and now, satellite "juke box" delivery. I use that term both deliberately and derisively. Some pundits did indeed predict the death of radio when the 8-track appeared. Even back then, they were unable to see that radio, *when done properly*, is a source of unique, local content, and not just a juke box!

Listeners want entertainment, and they'll tune us in if we're providing entertainment that they

can't get elsewhere. Listeners also want the info that's important to them: local weather, local traffic, local news and special events. Ride with a friend who's addicted to satellite radio, or who owns a case filled with CDs or an iPod filled with iTunes. Watch what happens when the weather turns bad. They'll switch to the radio to see what's going on. There you go. Draw your own conclusion and ask yourself how we can make them listen all of the time, instead of just in those special cases.

My rants are usually triggered by something; they don't just pop up out of the clear blue. (Even I'm not that fevered.) This rant comes not just from my experience with the storm last night, but from something that I learned this past week. Alabama's state EAS plan doesn't require that stations monitor the National Weather Service. When I inquired into this, I was told that it's a local programming decision. Aside from the fact that we're (once again) failing to provide what listeners want to hear right when they need it the most, that's just dumb. It's stupid and indefensible.

It's had an effect, too. While I was scanning the dial on that portable radio, I found lots of music and chatty jocks who were all ego and no intelligence. Very few stations were covering the severe weather. It's likely that this was because the station in question was unattended and its EAS decoder wasn't monitoring the NWS. Even worse, because the state plan doesn't require it, the primary relays don't forward severe weather info, either.

The bottom line is, I love radio, I still believe in radio and I am convinced that it can continue to be profitable well into the future ... *if* (and that's a big "if!") we don't forget what we do best.

Until next time!

Gateway Adventures

By

Rick Sewell, CBRE
Chief Engineer, CBC–St. Louis

Proverbs 27

Be sure you know the condition of your flocks,
give careful attention to your herds;

for riches do not endure forever,
and a crown is not secure for all
generations.

When the hay is removed and
new growth appears and the grass
from the hills is gathered in,

the lambs will provide you with
clothing, and the goats with the
price of a field.

You will have plenty of goats' milk to feed you and
your family and to nourish your servant girls.

Although we radio engineers don't have any "flocks" to attend (well, Ed Dulaney in Denver might have a few "flocks" running around on his transmitter sites), we do have assigned charges to take care of, that being the equipment that keeps our stations on the air and running smoothly. What I get out of Proverbs 27 is the idea that goes beyond just taking care of the flock. The idea being communicated is the wise shepherd is constantly aware of what is going on with his flock. It's the difference between being reactive or proactive.

As engineers, I am sure we all know what it is like to be in the "reactive" mode. It seems like some days, even weeks, you just run from putting out one fire and you're on to the next. It's days like that when Murphy's Law reigns supreme. It's hard to be proactive when you're in reactive mode. When we think of the shepherds in those ancient times, we naturally get the picture of them holding a staff waiting to protect the unsuspecting sheep from the cunning wolf or lion. I would also imagine that a wise, proactive shepherd would not wait for an outbreak of disease to take out half his flock. Instead he would be constantly on guard. As the passage states, "...give careful attention to your herds," watching over each sheep to detect disease early and isolate it from the rest of the flock.

These principles apply today in so many ways. The wise shepherd is told, "Be sure you know the condition of your flocks." As engineers, it is

important for us to know the condition of the equipment that is the life blood of our stations.

I remember when I switched to engineering, one of the requirements of the job was a twice weekly inspection of all the equipment. This is a very wise practice because often times you can head off a problem before it becomes a problem live, or not so live, on the air. There's

nothing worse than a client starting a live program and finding out one of their mics does not work. While board ops share some of the responsibility in this area, an inspection on my part may find the trouble before it's found out in an embarrassing moment in front of a client.

I used to think the twice weekly inspection to not be all that time consuming when I first came on board. But it seems like we have doubled the amount of equipment with all the computers that have been added to the facilities. Of course, big projects and lots of those Murphy days can quickly cause the regularly scheduled inspections to fall by the wayside. That's why you have to have those goals in mind. It can be too easy to fall into bad habits and find that you're always reacting to things when they happen instead of being ahead of the curve and being proactive.

Another area that can really show up and cause problems is the temporary fix that becomes not so temporary. For me, it's those temporary CAT-5 cables that I quickly route to get something going again that has to be fixed now. It's really easy to get busy and let the ball drop and not come back and re-route new cables properly. It doesn't take long and the equipment racks get messy or a run along the floor presents a tripping hazard. This is where knowing the condition of your equipment becomes important.

There are some things that require daily inspection. Having a directional AM station under my care presents challenges. While I wouldn't be out every day in the doghouses inspecting the antenna



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tuning units, I do like to keep an eye on the readings every day to see where they are trending and try to catch it before an antenna parameter goes out of legal limits. That way, you are not waiting for an alarm to tell you something is wrong.

Another one for me is an older satellite receiver that tends to need reprogramming on a regular basis. I try to log into it daily to make sure it still has its programming right. I try to catch this problem before someone tells me that a paid program missed its satellite feed and will have to be given a credit. I'm sure every facility has its problem child or two that need to be looked at even more closely than a weekly or twice weekly inspection.

The passage comes with both a warning and reward. The writer warns, "...for riches do not endure forever." The implication is that if you don't pay careful attention to your "flocks," it can affect your personal finances in a negative way. On the flip side, we are told that if we take care of our "flocks," we will be able to feed and clothe our families and even further our wealth as suggested by the "flocks" providing "the price of a field."

Of course, for the engineer who takes pride in his or her work, there is a reward in having a well maintained put together facility.

Valley Notes
By
Steve Minshall
Chief Engineer, KCBC

As a broadcast engineer, often being the sole expert on a station's systems makes for interesting and sometimes stressful vacations. Years ago, I was camping with the family and a park ranger would bring me messages each morning from the station. I had another vacation where I spent hours in a phone booth talking through a problem with a station.

We all know Murphy's law: Whatever can go wrong will go wrong, or something to that effect. There also seems to be an Engineers Vacation Law which would read: "The further away you travel, the more catastrophic the transmitter failure will be."

Last month, I was vacationing in Montana when I received a call. KCBC was of the air. The Nautel ND-50 transmitter was dead and there was a prominent burnt smell in the room. This is not a good thing, especially when you are a thousand miles away. Fortunately I have an assistant the covers me when I am gone.

Judging from the alarms on the transmitter, my best guess was that something went wrong in the combiner/filter cabinet. I had one of the station employees switch the antenna over to the old RCA BTA-50H Ampliphase. He warmed up the filaments

and then I had him switch on the plate voltage.

Switching on the plate voltage on this old transmitter is always an adventure. Turning that tiny



little knob activates a one hundred pound relay on the wall that sends 480 volts from a 400 amp breaker to three very large "pole pig" transformers. Twelve thousand volts from the pole-pigs is sent to the rectifier cabinet where it is rectified and filtered. Several times I have turned that little knob only to have the old rectifiers arc over on the other side of the glass window.

Fortunately, we had no problems and the plate-on activation was made without any fireworks. The plate voltage was just under 16 kilovolts (16kV is the point where x-rays are produced), the common point came up and the station was back on the air with 50,000 watts.

A visual inspection of the Nautel combiner/filter cabinet revealed a large mica capacitor had spit flame, smoke, solder, and debris all over the inside of the cabinet. Nautel did not have the capacitor in stock, but SURCOM did. The old RCA ran for two days while the ND-50 was cleaned and repaired. Maybe being away for this failure wasn't such a bad thing after all!

Catalina Tales

**By
Bill Agresta
Chief Engineer, KBRT**

Greetings from Santa Catalina Island!

June was one of those months where I got very little of the work I planned to do because of lots of surprises and because the weeding project has become much more work than I thought it would be. It was pretty hot and dry on the island this last month, and wouldn't you know it, one of our air conditioners stopped working. Thank God the problem turned out to be a simple relay gone bad – and I even had one on hand.

After replacing it, however, I decided to give all four of our units a good going through, replacing insulation, cleaning out drains, fixing rusted out parts and doing whatever else I could to help them make it through this hot summer season. Then it was on to a plumbing issue where one of our water mains broke, the one that supplies our fire suppression connection. This connection was



probably put under considerable stress during last year's fire, so it was no surprise to see it break. Then for the grand finale, my teenage daughter decided to do some extreme teenager stupid stuff just to make sure the month did not go by too quietly.

Through it all, however, farmer Bill (me) kept the weeding project moving forward. The company purchased a DR Field & Brush Mower, one like you see in the TV commercials, and it does a great job but it also gives me quite a workout. After

the first day of use and a very sore day after, I decided it works better to schedule this project as a day-on, day-off project. The hot sun alone can be pretty tough to deal with. I am usually pretty dazed after a full day of mowing in the sun, so I am not much good doing other projects until the following day. I am dealing with just that situation right now as I spent the entire day today out mowing and am now trying to find enough energy and clearness of thought to write. I just hope that I eventually win this battle because these weeds

seem to grow as fast as I can cut them down!

It's nice to have a snake spotting dog alongside, too, as I have run across many snakes this last month. He usually spots them before I get to them, so no bites yet. Though mowing an entire tower field with this mower is a bit slower than using a



larger tractor, this mower does a much better job as I can maneuver it around obstacles and make it ride over unearthed ground elements, rocks and other debris. Now I got to start planning on water tank repairs!

Finally, just over a full year since the fire, AT&T is beginning to repair the phone lines here on the island. We have been running on burned lines and makeshift repairs for the last year, and it has really made life tough at times. It was a great sight to see

the contractors show up in our driveway to finally replace the old burned pole that has been literally hanging from the lines for the last year. They are now replacing the old burned trunk with fiber and soon (I pray) we will have a fiber node installed near our driveway, allowing us to finally have our DSL restored and our T1 made reliable enough to actually use. This will also allow us to install ISDN lines if we find use for them again. The old system had us too far from the switch on old copper pairs to give us ISDN service, so this fiber optic node is a very welcome upgrade. With all this available bandwidth, we will now have a many more options now available to us.

This month is *back to the drawing board*

month, and it seems I find myself doing this from time to time here, especially since the fire last year. After several projects don't go as planned, things begin to pile up and can quickly get unorganized. If I just keep moving forward, I eventually hit a big OOPS, so I find it much easier to stop, go over my list and reorganize/reprioritize the projects before beginning a new month.

So, here's looking forward to next month! 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

HD in Flyover Country

Mack Friday and I spent a recent evening at the local SBE Chapter meeting, taking in a manufacturer's presentation about the possible new FM HD Radio power output standards and how to prepare for them. I have a close friend in the business who is also an SBE member, so I gave him a heads up that we'd be there, and he agreed to drop by.

Len is one of my very best friends, both personally and professionally. I met him the day after I came to Chicago, 32 years ago, when he visited me at my new station and asked to borrow a piece of equipment which belonged to my new employer. He had made this deal of "work for time borrowed" with my predecessor, and he trusted that I would honor it. For my part, I just trusted him, naïve little person that I was, in my second CE job ever. For the record, Len was true to his word. He worked his buns off for me in payment, and I put him to good use. That started a close bond which has gone through a tremendous amount of professional and personal thick and thin. Everyone in this business should have a friend like that.

Len was starting a project to build his first radio station back then. I helped him build it. I've actually been associated with the station as recently as this year, although he has long since sold the place.



He's now a multi-station owner, both AM and FM, all of them outside any of the major markets. They vary from very to marginally profitable. He's a manager of a major web site, a former technical director of a major ad agency, and very knowledgeable of the business in ways which I can only guess. This particular evening, I decided to tap his brain again, about his take on HD Radio.

I just wanted to know what it would take for him to put his stations on in HD. Yes, he's very 'up' on the subject, and though some of his knowledge he's gotten from me, he's given the question a good bit of thought and he told me three things which are going to have to happen in order for HD to get on his air. I send these answers along because I think that this is also the thought process of a lot of station owners out there in flyover country, away from the major markets.

First, Ibiquity's license fees to broadcasters are going to have to go away. Anything within breathing distance of \$10,000 a year to broadcast in digital is a sure guarantee that it's not going to happen. And that's just an average I'm talking here. It gets higher from there these days. To put it another way, Ibiquity's income is going to have to come from per-set royalties. The volume isn't quite there yet to support that.

The second requirement is related to the first. There are going to have to be a bunch more HD radios in the homes and cars out there. Right now, in the hinterlands, there still aren't enough. Len suggests that the magic number, the critical mass point, is going to be maybe 10% penetration, and that's the bare minimum. It all goes back to promotion, promotion, promotion, and there needs to be a lot more of that from all sides: Ibiquity, the broadcasters, and the retailers, all should be involved in a coordinated effort. What are Crutchfield and Wal-Mart doing about this? And as far as Radio Shack is concerned, don't even ask. We've had this discussion before and they're a lot more shack than radio anymore. In other words, "room for improvement" is a small way to say it.

The third thing, and this is something I haven't thought about until Len mentioned it, is used HD equipment. When HD equipment, such as Dextars and FSi-10s and FXi-60s and other such, come on the 'pre-loved' market in a few years, chances are they are going to be snapped up in a heart beat by a new generation of rural and marginal broadcasters for twenty cents or less on the dollar. Maybe that's when HD will finally come into its own nationwide. It occurs to me as I write this that we here at WPWX are something like a couple of weeks away from celebrating our fifth anniversary of HD operation. When and if the FCC decides on an FM-HD power increase, one or two years from now, maybe that's when some of the older equipment will go on the market, as new equipment is purchased to take advantage of the higher power levels allowed. Who knows? Whatever happens, the old stuff, if it doesn't stick around, likely will have happy new owners who are willing to put the new medium on the air and profit by it.

But not until all three of these conditions are met, I would suggest. As usual, I think that Len is onto something. Maybe the industry should think ahead to the day, and see that it comes sooner rather than later, and by whatever means.

Tower Tales

This is a cautionary tale, to say the least. What shocks me, in going back through the *LO* archives since January, is that I hadn't mentioned this story before, but here it is, pretty much beginning to end, for your edification and education. Just to let you know, the names have been changed or redacted to protect the guilty. I won't even give the location of the tower company, though you can guess that fairly closely, since most of the big ones and a lot of the lesser ones are located within about a 150 mile radius

of a certain Midwestern town.

Early last December, one of my best friends, who is the Ops Director / CE of a nearby FM station, called to tell me that he'd lost his tower. Sure enough, the thing had keeled over from the center, smashing the top end, including the antenna, into the ground. What was left of the tower was dismantled, and the search went on for an alternate temporary site, and for a new tower to replace the old one at the main site. A post-mortem was done, and the cause of the failure turned out to be acid soil conditions at the tower site which, across time, reduced the size of the both of the anchor rods from two inches thick to less than the size of a #2 pencil. No, there was never any cathodic protection on that tower. One ice storm/wind storm later, the anchor snapped and the tower went down. Game over.

The alternate site search is *not* the issue here for, let's just say, space reasons. The search for a replacement tower, though, well, there's the story.

With apparently not much forethought on the part of Corporate Engineering for the station's owners, a contract was signed with a tower company to replace the tower. No, it's not a name you would readily know, and let's leave it at that. Suffice it to say that there wasn't much forethought on the part of the tower company before they signed, either. Simply put, they didn't do a due diligence study with regard to the reasons why the original tower took a head from the waist. After all, they weren't the ones who had removed the tower; that had been done by a local outfit. But, they were the low bidder on the project so, for that reason alone, Corporate gave them the contract. Mistake number one, on both sides: no due diligence. No thought beyond the lowest bid. Earnest money was then sent. Mistake number two: No due diligence on the station's part of the tower company before sending in the deposit.

After the contract was signed, *then* the tower company began to take a serious look at the situation and realized what the problems were with the site. For their part, the station's Chairman of the board, himself a former structural engineer, began to mandate a rather major change in the specs for the job: stainless steel guy anchors, to prevent the sort of corrosion which had doomed the earlier tower. Anybody out there ever seen or used any of those?

The tower company got really concerned, apparently, and called and raised the bid by something close to \$100,000. Hardly a good business plan. Wasn't a good plan on the part of the station's Corporate folks, either. There are at least two better ways to handle a situation such as this: Cathodic protection of the guy anchors, or concrete casements

to at least grade or, in the case of the swamp where this tower was to be built, two or three feet above grade. Corporate Engineering, however, was going for neither. It was stainless steel or bust.

There were other issues. The tower company was making little if any progress on dealing with the station about the new tower installation. The station's Engineer and Corporate had asked over and over for mechanical drawings of the new tower, since these had to be shown to the county building and zoning department for approval of a building permit. None was forthcoming. Without any progress being apparent, things were starting to get rather acrimonious.

So, when the tower company suddenly upped the cost to the station by a hundred large after the deposit was sent, the station's ownership canceled the contract and subsequently signed a second deal with a main line tower manufacturer for a brand new tower.

Then the original tower company announced that none of the deposit would be returned. That did it. Corporate sent a VIP staffer to that tower company to find out what was what. What the fellow found out was nothing short of weird. The tower company had bought the tower they were going to use for this project from another company, a name you would know, but that company had sold the tower manufacturing part of their business some years before, and had sold *that* particular tower to the tower company *for scrap*. The tower had been stored in the original tower company's back yard for some years before they had seen a possible customer to sell it to, namely our friends here at the local FM station. Now the station's owners are naturally quite ballistic about this, and I'll bet that lawyers will be sparring over this dispute long before the game is over.

Meanwhile, the second tower company is moving forward with the new tower for the station, this time with proper drawings for the B & Z boys, and with proper concrete anchors coming up to, and well above, the soil surface of the station's transmitter site cum swamp. The Corporate VIP had the wisdom to come up after his trip to the original tower company's place and have a talk with our local Ops Director/CE friend, see the site first hand, and really learn about why the guy anchor footings should be built above grade. The folks at Corporate who nixed that part of the project have now been overruled. The tower should be going up any week now, with proper anchors, and should stay up for a long time.

The lessons abound here, and they are applicable to a lot of tower replacement projects, and

from what I'm seeing around the country, there are a lot of such unforeseen projects this year.

First, as important as knowing your tower company, *know your new tower*. Make sure that it is exactly what you need. I strongly suggest that unless the circumstances are compelling, don't use a used tower. Same rules as cars apply here. My experience is that a destroyed transmitter can be replaced in two weeks or less, no sweat. Often, it can happen in less than 48 hours. Emergency tower replacement takes months, sometimes a year. Just ask anyone who's been there. The red tape alone will kill you. I have witnessed a half dozen such scenarios. Your down time with a downed tower may become the death of your station. Point is, once you've been through it, you don't want to go through it again. More on this in a moment.

Second, know your tower company. Investigate the bidders, hard. Find out their track record. Get a client list. Call those clients and ask the tough questions. In this business, be as suspicious of the lowest bidder as you are of the highest one. And, having said all that I have in this article, don't pooh-pooh tower erection companies who don't make towers themselves. Many of our towers here at Crawford were made by Utility but installed by Rocky Mountain Erections – good companies, both. We have other companies right here in town that make their living off constructing good towers from good manufacturers, and all are good companies to deal with themselves. But at least find out all you can about your bidders before you lay down any earnest money.

Third, if you had an old tower which failed because of a factor on-site, such as soil conditions, or being located in the local tornado alley or earthquake area, either consider moving if you can, or getting a tower or construction plan which will address those conditions. If soil samples are taken at the site – and they'd better be – get a copy of the report and look at it closely. Get a local structural and/or soil engineer's second opinion. The cost isn't that big in the whole scheme of things. If your tower is to be sitting on acid soil conditions (and here's a clue: anywhere around where coal is or has been mined, or the soil is particularly high in organic matter, is likely a high-acid soil area) *or* if said tower is to be located anywhere in proximity to any oil or gas pipeline, then don't even consider bringing your concrete anchors caissons up to grade or above. Just do it – design it into the spec. It'll save your tower without the expense and the maintenance issues of cathodic protection. We use that method here at the WPWX site in Burnham, since the far north guy anchor is

located within some four feet of such an active pipeline, and it has saved our tower a thousand times over.

You might want to consider this: Though more expensive, a free-standing tower instead of a guyed one may solve a lot of problems of acid soil, tornadoes and earthquakes. That happened here in Chicago not long ago when a local college's medium powered FM station lost its 300-foot tower due to acid soil conditions. It took almost eight months, but the replacement tower was a much sturdier free-stander, and the college has turned the new tower into

a profit center, with space rentals galore. A word to the wise.

It pays to take care of your tower before it gets to the point of falling over, of course. Not nearly enough of us do it, and those that do probably don't do it often enough. But if the unthinkable should happen, that's when you really should start to be thinking about what you're getting yourself into with a new tower and erection company. Better yet, have a plan ready *before* the disaster hits. I hope this article helps. Let me know what you think.

Until next month....

The Portland Report

By

John White, CBRE

Chief Engineer, CBC-Portland

All Quiet on the Sun Front

(with apologies to Erich Maria Remarque)

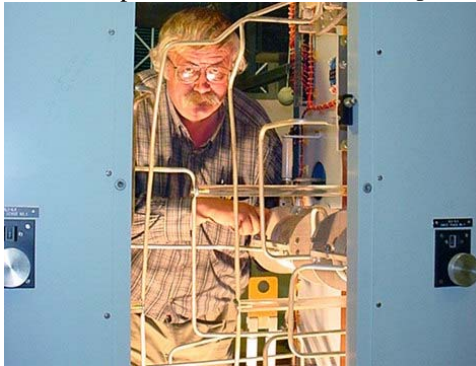
Back in January, Cris mentioned that daytime skywave propagation was being reported. Cris noted that with a very low number of sunspots, the absorptive D layer was not forming as strongly as we have come to expect. I have been following the sun activity and sunspot numbers for some time, and I recently came across an article in *Science Daily* discussing sunspots and sun activity in general.

The article said that the sun has been very quiet for the past couple of years, producing few sunspots. It noted that this is good news for satellite operators and others who are adversely affected when space weather interferes with their technology. But it also became a point of discussion for the 100 scientists from Europe, Asia, Latin America, Africa and North America who gathered at Montana State University June 1-6 to talk about "Solar Variability, Earth's Climate and the Space Environment."

The article quoted Saku Tsuneta with the National Astronomical Observatory of Japan, program manager for the Hinode solar mission: "It continues to be dead." It confirmed that the last cycle reached its peak in 2001 and is believed to be just

ending now. The next cycle is expected to begin soon and to reach its peak sometime around 2012, but the sun remains as inactive as it was two years ago and no one knows why. Tsuneta called it "a dead face."

In past history, the sun has gone quiet, so today's quiet sun is not without precedent. With longer summer days, the D layer has a longer period of time to form, so daytime skywave is less noticeable. Just the same, it's best to keep daytime skywave in mind when making field measurements. For anyone interested in monitoring the current sun condition, check out this link:



<http://sohowww.nascom.nasa.gov/data/realtime/mdiigr/512/>

As I have mentioned in several prior columns, housing development has been moving closer to the KKPZ transmitter facility on Mt. Scott. As I have reported in the past, the KKPZ property and adjacent wooded areas have long been the habitat of northwest wildlife.

Recently, Radio Inspector Bambi came to look over the facility. She inspected the transmitter building and the base current at the tower before

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taking a few minutes to relax. The day I took those pictures, Bambi and her fawn came in through the main security fence gate and casually grazed without much alarm as I walked from the building to my car.

Then a week later, we had a visit from

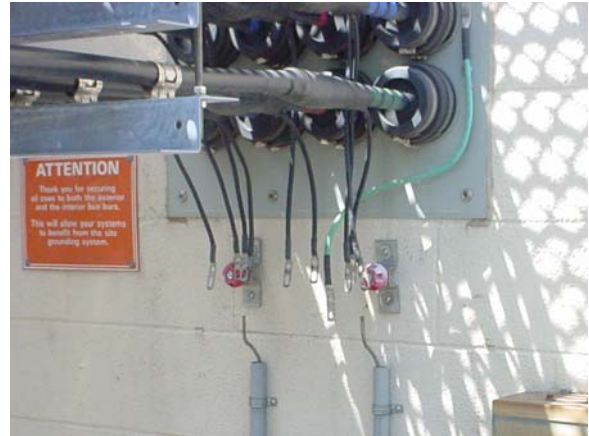


Wildlife Officer Wil E. Coyote. Officer Coyote came to conduct a wildlife evaluation at the KKPZ and KDZR transmitter facility. Officer Coyote seemed particularly interested in the habitat and wildlife environment at the transmitter and was closely watching the native rabbit and mouse population. When approached by this reporter, Wil E. Coyote declined to comment on his dinner plans.

Deer, coyotes, and hawks are not the only animals at the top of Mt. Scott. With numerous towers at the top of Mt. Scott, we have a fairly brisk business checking tower detuning. And so it was in

late June that Tom Gorton from Hatfield & Dawson and I made the trek to the nearby Mt Scott tower farm to check tower detuning – a visit long delayed by the presence of two 150 foot construction cranes in the area.

As Tom and I made the trip to the tower to do a simple half-day tower detuning check, we found



it just wasn't going to be that simple. Another kind of animal had visited the American Tower installation to collect copper, specifically, the ground bus bars for the coax cables. The astonishing thing is the thief apparently spent some effort removing all the attachment bolts rather than simply cutting all the pigtails. Well, at least the repair wasn't totally horrendous.

Rocky Mountain ``Hi``

The Denver Report

by

Ed Dulaney, CSRE, CBNT, AMD
Chief Engineer, CBC - Denver

Aging

I've noticed that as I get older it takes me longer to recover from those occasional late-night transmitter repairs! When I was in my 20s, I actually loved the evening trips to the transmitter to do the monthly maintenance routine. Back then, I worked for a station that had only one transmitter, and no backup. So every month I'd spend a couple of hours in the late



evening cleaning out filters and blowing the dust out of the PA section of the transmitter. This was in a very dusty environment and if you didn't get out there for a couple of months, the dust and dirt would accumulate on the cooling fins of the tube, dramatically shortening its life.

Now that I work for a company that believes in having backup systems in place, those late-night excursions every

month are a thing of the past. And that's good news! Even though I've just hit 45 years old, I am starting to see why the engineers I've known that are in their 50s complain about late nights at the transmitter. It's just not as much fun as it was when we were young and full of energy. Of course, there is a reason why I've brought this up, and that reason will become quite clear in the next paragraph.

KLTT Contactor Failure

Late last month, I was notified by one of our operators at KLTT that the common point current for the station had increased from its normal 5.4 amps to roughly 7.8 amps. That would mean that the power had also increased from 1,400 watts to 3,000 watts! This didn't see right to me, so Amanda and I started doing some digging into the Burk logs to see what was up.

The first thing we noticed was the tower parameters. They were way out of whack. This likely meant that the common point was no longer 50 ohms, but something much lower. A trip to the site verified that fact. The common point was actually closer to 29 ohms than 50 ohms. And the "X" was off the scale to the negative side. Transmitters normally don't like to operate into a 29 -j100 load, but in this case the transmitter is an ND-50. It was quite happy to pump power into that load at 1,400 watts or so. Therefore, it never went into an SWR shutback as the reflected power was somewhere around 100 watts. That transmitter won't experience a shutback until the reflected power is over 800 watts.

Our mission, then, was to figure out why things were wonky (yes, that's a real word!) at the towers. This was typical Troubleshooting-101 stuff. First, check the monitoring to make sure the problem is real. Then check the mechanical connections to make sure nothing has come loose. Next, check capacitors and insure that a .0024 is still a .0024 and not some other strange value. Finally, check everything that you didn't check the first time around!

We knew we had a real problem. Tower readings off, common point messed up, and an elevated reflected power. So the next step was mechanical stuff. We examined all the coil taps and connections and found only one minor problem – a piece of tubing that was barely making contact. That was corrected, but it still didn't solve the issue. We also checked the transmission lines and found those to be in good shape.

It was time to bring out the capacitor checker. We tested every capacitor in the night circuit, and none of them were bad. Okay, so now we

had to go back and check everything else!

That was when I had an idea. I started with tower 2, for no other reason than the fact that the Potomac 1901 monitor was already displaying that tower. I started cranking the phasor knobs for the power distribution to that tower. Aha! Nothing changed on the display at all. I even tried cranking the phase control, but there was still no change. Just to make sure I had all my bases covered, I tried adjusting the other towers. Those all worked normally. Therefore the problem was at the tower 2 ATU.

I sent Amanda out to the tower while I stayed in the building and watching parameters on the antenna monitor. First, I had her pull the J-plug on the ATU input. There was no change. Then I had her pull the J-plug on the output. As expected, there was a complete drop in the readings. So far so good.

From there I had her work backwards in the T-net. First I had her pull the output coil tap. That made a change in the readings. Next was the shunt leg. Again I had a change in the readings. Finally I had her pull the input leg tap. That gave us only a minor change in the readings. This told me that there wasn't a problem at all in the T-net.

That left only a couple of things to check. I had her look at the connection from the input leg of the T-net to the contactor. It was solid. Then I had her take an ohmmeter and check continuity from the input of the T-net to the coax. It was open! The plot thickened.

As it turned out the problem was that the fingerstock on one side of the contactor wasn't making contact with the switch bar. In fact, I found it hard to believe that it ever made contact! There was at least a 1/16" of gap on each side of the bar. I bent the fingers out more, and we tested continuity again. It was fine now, and all the readings came back into tolerance.

In almost 30 years of broadcast engineering I've never seen anything like that before. Sure, I've seen corroded fingers and I've even seen some that were burnt so badly that you wonder how they ever worked! But to see one that the fingers weren't even touching the bar was unexpected. Chances are that only one of the fingers had ever contacted the bar. We did notice that one of the fingers had been broken off, so that was likely the one that was making contact. When it broke, the readings went haywire (yes, that's a real word, too!).

So now we have a new item to add to our annual maintenance checklist. And you other AM guys do too!

Mowing... Finally!

Well, after almost two months of problems with the tractor, I managed to get most of the weeds mowed at the KLVZ site. Thankfully, the tractor performed perfectly. If it had not, then Cris would have likely had some serious issues with me, as I was contemplating sinking it into one of the ponds at the gravel quarry that's next to the site!

You never realize just how much those weeds grow until you're out there in the middle of them! Some of the thistle was over five feet tall, and a few were as tall as me – and I'm over six feet tall!

My biggest concern now is the amount of dead brush that we have out there at the site. I'll likely take the tractor and use the blade we bought to break up the brush areas. That way, if something happens to catch on fire due to lightning or other reasons, it won't spread very far.

Being Green

Kermit used to sing, "It ain't easy being green!" For radio stations, that's so very true. However, in this era of rising fuel costs and electrical rates that have almost doubled in the past five years, we engineers need to start thinking about ways to conserve power at our sites.

One of the areas that I've been looking into is wind power. There are companies out there that manufacture wind turbines that could supplement the electrical needs of a transmitter site. One of those companies, and I won't mention its name here... yet,

is looking into developing a wind turbine using non-metallic parts. That would mean it would be lighter than a typical turbine, and it could be mounted on an AM tower with very little effect on the signal.

Other areas to think about are our driving habits. A few months back I wrote about the ScanGauge unit that I'd installed in my car. Well, the results are in! In May I spent roughly \$20 less on fuel than I did in April, and I drove the same amount of miles! In June I spent \$75 less on fuel, but I also drove the car much less, relying instead on my motorcycle (which gets 70 MPG!) to get around.

And there's other ways we can save both ourselves and the company money. For instance, when we leave the office we should shut down our computer and monitor. That's something I've tried to remember to do, but it's hard to break old habits. Even if a computer goes into standby, it still consumes about as much energy as a 60 watt light bulb. I also keep the lights off in my office all day, unless it's so cloudy that I need to have them on to see!

I know that we all laugh at people like Al Gore that keep running around screaming about global warming. But just because a few people have the intelligence of a snail doesn't mean that saving energy is a bad idea. Just think about how much extra money we will be able to pocket if we take steps to conserve energy.

Until next month.... Press on!

Digital Diary

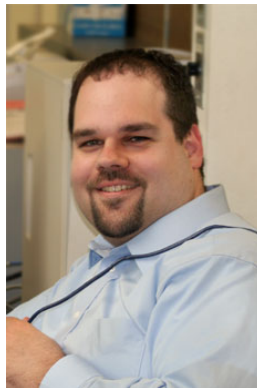
by

Larry Foltran

Corporate Website & Information Technology Coordinator

Preparing for the Worse Case Scenario

A few months ago, I covered the importance of regularly backing up your data in case of hard drive failure, computer meltdown, asteroid strike or whatever catastrophe that could send your data into cyber la-la-land. This month, as a direct result of something that happened here at the station, I feel it may be necessary to broaden the scope of data backup to include setup and configuration information. I was told years back that the best lessons are



those that are learned in the toughest of circumstances. I'm quite confident that this lesson was a good one.

So here's the scenario. An upcoming change to our station's phone system necessitated a switch of our Internet connection to a different phone line. I initiated the request with the service provider (which shall remain nameless unless you contact me directly) and discussed the technical changes that would be required at length with the

representative. Although our static IP addresses would most likely change, I was told everything else would remain the same. With a smile on my face, I made a quick and short list of settings that would require modifications. I also mentioned to the local staff that Internet service may be down for a short period of time, but any outages would be limited. Enter Mr. Murphy and his sinister law.

The day arrived and the provider's technician arrived to make the switch. I decided to play "20 Questions" and double checked what changes would be made to our system. In concert with the phone representative, he told me that our static IP addresses would be changing. I should also mention that when we initially made the move to the new Internet service, it took several hours of configuring this modem to ensure it played nicely within our network. Needless to say, I made a point of telling him that we would like the modem left "as is." Confident that this gentleman had everything under control and understood what we needed, I returned to the meeting I had been in and left him to his work.

After the meeting, I was pleasantly surprised to see that our Internet access was working. Moments later, the connection disappeared and I decided it would be a good time to check on the tech's progress. It was at this point that I noticed his laptop connected to the modem. My level of concern began to quickly elevate and apparently my facial expression clearly conveyed the thoughts running through my head. The tech explained that he wasn't able to access the modem, so he reset it to the factory default settings.

I'll spare you the remainder of the details

and, quite honestly, recalling it further simply gets my blood boiling all over again. It was at that moment that I realized there would be another handful of hours spent configuring this modem and some unhappy folks at the station that wouldn't be able to check their email.

That brings me to my point about configuration backups. Although I have an established backup schedule for my crucial data, configuration backups had been limited to our firewall appliance. After this incident, I felt it was necessary to conduct an audit of any routers, appliances, and equipment critical to day-to-day office operations that are specifically configured. Although many of these pieces of equipment can also affect the engineering side of the building, I felt the office side is in greater danger of backup neglect than the equipment in the back room.

Although the vast majority of our equipment features a quick and easy backup function that was copied to my PC and further backed up to an off-site external hard drive, the modem posed a bit of a challenge. The only option for backing up its configuration was to an FTP server. We basically created a mock FTP server on my PC and sent the back up information to that, which also was copied to the external drive.

With all of our configuration information located both locally and off site, we should be able to quickly restore the equipment configurations in the event something happens again. Although I suppose that point would be moot in the case of an asteroid strike.

...until next month!

The Local Oscillator
July 2008

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

KCBC • Riverbank - 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 • 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

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

WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT

WYRB • Genoa - Rockford, IL
106.3 MHz, 6 kW/65m AAT

WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT

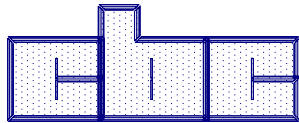
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND

WYDE-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT

WXJC • Birmingham, AL
850 kHz, 50 kW-D/1 kW-N, DA-2

WXJC-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

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