The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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AM Revitalization

Last month I gave you my take on the FCCôs AM Revitalization order and what it means for our stations and company. This month weôll take a look at the Notice of Further Proposed Rulemaking (NFPRM), what it may hold for us and what our positions are with respect to the proposals.

Class A Protections

At the head of the list of FCC proposals is Class A nighttime and critical hours protections. For decades, Class A stations (formerly known as ñclear channelò or Class I stations) have received a level of interference protection not afforded any other class of station. While the daytime and critical hours protections are a problem for spectrum neighbors, itôs the nighttime protections that often require co-channel stations to reduce power to just a few watts, employ a very tight directional pattern with deep nulls or go off the air altogether at night.

The justification for providing protection of Class A stations to the 0.5 mV/m 50% skywave contour has long been to provide service to areas that otherwise receive no aural broadcast service. That justification no longer exists, at least in a meaningful way. Considering the greater good, without the requirement to protect the huge skywave service contours of Class A stations, local AM stations could provide locally-relevant broadcasts to local audiences at night whereas distant Class A stations cannot.

The FCC proposed in the NFPRM to do away with critical hours protections altogether for Class A stations, retaining the current protection to the 100 uV/m groundwave contour day and night for co-channel stations and to the 0.5 mV/m groundwave contour for first-adjacent channel stations. I could perhaps go along with a protection to the 0.5 mV/m groundwave contour for co- and first-adjacent channel stations, but the 100 uV/m contour is not listenable in many (most) locations because of environmental noise. In fact, elsewhere in the NFPRM the FCC proposes a change to the normally protected contour for all other stations to 2 mV/m because the 0.5 mV/m contour is not listenable due to noise. If the 0.5 mV/m contour is not listenable, the 100 uV/m contour is well below the noise floor.

Our comments will recommend doing away with skywave service area and critical hours protections for Class A stations, and providing groundwave protection to the 0.5 mV/m contour day and night, the latter a tip of the hat to the unique role that many Class A stations play in emergency and disaster communications.

Night RSS Calculation Methodology

Back in 1991, the FCC did a comprehensive overhaul of the AM technical rules. One of the changes was to the RSS calculation methodology to a 25% exclusion that also included first-adjacent channel contributors.

For those unfamiliar with how night interference is calculated, a root-sum-square (RSS) addition is employed. This really amounts to adding the power of each contributing interferer (remember that power is proportional to the square of the voltage). This is done by first calculating the interfering signal from each co- and first-adjacent channel station, sorting them from highest to lowest and then adding them in RSS fashion, employing a fixed exclusion.

For decades prior to 1991, the exclusion was 50%. If the top interferer produces a night limit of, say, 5 mV/m at the site of the other station, a 50% exclusion would preclude inclusion of any stations producing a limit of less than 50% of that value (2.5 mV/m). If the second station on the list (in order of

limit produced, highest to lowest) produced a limit of 3 mV/m, that would be above the exclusion line, so it would be included. The top stationôs 5 mV/m would be squared and added to the second stationôs 3 mV/m squared, and the square root would provide the limit produced by those two stations in combination (in this case, 5.83 mV/m). If the next station on the list was above 50% of that value, it would then be RSSed in. This would proceed down the list of possible contributors until the next station was below the exclusion line. Itôs a fairly simple process, really.

As noted above, with the 1991 change, the FCC revised the exclusion to 25% and it brought in first-adjacent channel contributors. This did two things. First, it raised the night limits of virtually all stations (because it brought in more interferers), and second, it reduced the amount of interference a co- or adjacent-channel station could produce toward a station to below 25% of the stationôs night limit. This had the effect of handcuffing both protected and interfering. Protected stations often could not produce the required 85% coverage of the city of license with an interference-free contour (because that interference-free contour value was raised by the 25% exclusion), and that limited their options, often to zero, of moving sites, changing directional patterns or whatever. Interfering stations found themselves grandfathered in to their current power/pattern because where once they did not enter the protected stationôs limit, with the 25% exclusion, now they do.

The FCC proposes to roll the RSS methodology rule back to the pre-1991 language, which would restore the 50% exclusion and eliminate adjacent-channel contributors in the calculations. That will give everyone some breathing room. We will support this proposal.

Daytime Protection Changes

Also as part of the 1991 AM technical rule overhaul, the FCC changed the daytime protection ratios for first-adjacent channel stations to 6 dB and implemented 0 dB ratios for second- and third-adjacent channel stations with prescribed prohibited overlaps. About all this did was produce a bunch of grandfathered existing overlaps and handcuff stations from making facility upgrades and moves because of those overlaps.

The FCC, in the NFPRM, recognizes this and proposes to revert to the pre-1991 protection ratios. The co-channel ratio would remain at 26 dB (20:1 D/U). The first- and second-adjacent ratios would revert to 0 dB (1:1), and third-adjacent protections would go away altogether. Second-adjacent channel stations would have a prohibited 25 mV/25 mV overlap (in contrast to the current 5/5 prohibited overlap). All this would do away with all the grandfathered existing overlaps and give stations some breathing room to move and upgrade.

Another facet of this proposal is unrelated to the 1991 rule change is a proposed change in the daytime service (normally-protected) contour to 2 mV/m, up from the existing 0.5 mV/m value. The FCC states in the NFPRM: ñThese changes are designed to allow AM stations to increase power to overcome increased level of environmental noise,ò immediately followed by a proposal to raise the primary service contour to 2 mV/m.

We will likely support these changes because they will provide us with the opportunity to increase power and modify directional patterns to provide stronger signals within our coverage areas. Given the ever-increasing levels of environmental noise, we need all the signal we can get.

Cross-Service Translator Siting Rule Changes

When the FCC first began allowing ñAM on FMò translators, it placed a restriction on such operations that would keep the translatorôs 1 mV/m contour within the lesser of the AM stationôs 2 mV/m daytime groundwave contour or a 25-mile radius from the AM site. This worked fine for lower power AM stations where the translator could be located on the AM tower, but it did not work at all for stations with transmitter sites a good distance outside of town.

In the NFPRM the FCC proposes to change this rule to the ñgreater ofò the 2 mV/m contour or a 25-mile radius. Unfortunately, they also added a restriction that would not allow the translatorôs contour to extend beyond a 40-mile radius from the AM site. While the change to the ñgreater ofò the two criteria is very helpful, what about AM stations out in good conductivity country that put a 2 mV/m contour over a population area some distance from the AM site (greater than 40 miles)? Those stations could not site a fill-in FM translator in that community. We will support the change to the ñgreater of,ò but we will oppose the 40-mile restriction.

Partial Proof Changes

Over the years, partial proof requirements have been pared down to what they are now: eight or more points on the monitored radials or, if fewer than four radials are monitored, the adjacent radials as well. This has worked fairly well for a number of years, but I have long found measuring anything other than the monitored radials (those radials for which there is a licensed monitor point) is a waste of time, effort and fossil fuel. If there is a problem, it

will most certainly show up on those radials where the vectors all line up in opposite directions.

The FCC proposes to eliminate all except measurements on monitored radials. We will support that proposal.

MoM Rule Changes

Since the Method of Moments (MoM) proof rules went into effect in early 2009, we have learned a great deal about what works and what doesnôt work, what makes sense and what doesnôt. The FCC issued a clarifying public notice in 2010 dealing with many of these issues by ways of policy. In the NFPRM, they want to codify these clarifications, which I wonôt detail here except for one: the requirement to make reference field strength measurements.

Of all the elements in the MoM proof rules [§73.151(c)], the one that makes no sense to anyone I have talked to is the requirement to make reference field strength measurements, especially in the context of the required biennial sample system recertification. There is no requirement to take any action if one or more of the measured field is at significant variance from the originally-measured values, so why make them at all? For some reason, the FCC opted in the NFPRM not to eliminate reference field strength measurements and instead raised several questions about modifying the requirement.

We will support all the proposed changes except the one to keep reference field strength measurements. That one we will vigorously oppose. Those measurements are a big waste of time, effort and yet more fossil fuel.

Expanded Band Sunset

When the expanded band was created, it came with a plan to migrate the greatest interferers from the standard band to the expanded band and provided for a five-year sunset period to allow for expanded band capable receivers to proliferate. At the end of the five-year period, licensees had the choice of surrendering either the standard band or expanded band license and taking that station dark. While many licensees surrendered one or the other (I believe that all who surrendered a license kept the expanded band station), some requested and received a waiver, and to this day some 25 standard/expanded band pairs remain on the air with both stations.

In the NFPRM the FCC proposes re-instituting the sunset and requiring surrender of one or the other license for each pair. We will strongly support this proposal. The migration to the expanded band needs to wrap up, and we would then like to see the band opened up for additional stations at some point.

Next month, Iôll deal with the two items in the Notice of Inquiry that was contained within the AM Revitalization order.

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

Hello to all from Western New York! This time last year, we in Buffalo were digging out from under eight feet of snow that fell the last week of November. It took a week to clear streets enough that travel would be possible, and believe it or not, it was August before the mounds of snow finally melted. The winter months seemed to last forever last year as we were pelted with one storm after another along with sub-zero temperatures, making life miserable for those whose jobs require them to get out and travel.

What a difference a year makes. Fast forward, itôs December, and we in metro Buffalo have not seen the first inch of snow yet! We are creeping up on the record for the latest snowfall, and after last year, I hope we break it, and none too soon!

As in this time each year, much of my time is spent outdoors, preparing our facilities for the upcoming winter months. This year was no different; all the usual items were winterized and sealed from the cold and blowing snow. I had hoped to get the doghouse doors sealed this year at the

WDCX(AM) transmitter site, but I simply ran out of time to get this accomplished. I am hoping that the foam seals are still tight enough to keep the snow from blowing in around the door and sill. There is nothing worse than trying to gain access to a doghouse whose door has frozen shut to the floor.

A lot of my time was spent last month working on IP issues we are experiencing here at WDCX. Time Warner is our internet service supplier, and upload speeds and reliability have been marginal at best. The best they have to offer for speeds is 35/10 mbps, which by comparison to other providers is a snailôs pace. Verizon FIOS is not available in metro Buffalo, only the surrounding towns, and aside from Verizon, Time Warner is our only option.

The burn was apparent on the outside of the line section.

We use the internet daily to provide programming between our stations here in Buffalo and our sister station in Rochester. For twelve hours daily, we send/receive programming bi-directionally via the Zephyr/IP, and recently, we have utilized the TieLine Bridge-IT to take up some of the slack when we have to use the Zephyr/IP for remote broadcasts. In the past, when we had a remote, the audio to Rochester was sent via ISDN, which is costly if used over a period of time. By incorporating the TieLine into our daily activities, we can substantially reduce our ISDN usage to emergency only.

Getting back to the internet issues, downloading shows, audio, etc. has not been an issue. Our problem is when we upload audio. We experience tons of dropped data packets, latency, and the jitter buffer empting out. So far, Time Warner has not come up with a solution. They are leaning toward a problem in the upload node but have not developed a game plan to resolve this issue.

It was even more apparent on the inside.

Several months ago in our Rochester FM facility, I noticed that the reflected power on both our analog and digital transmitters was creeping up. When it got higher than I wanted to see it, I began troubleshooting the cause. I found that the reject load, which is located outside the building, was the culprit. We utilize high-level injection for our HD signal.

I removed the injector from service and plumbed the main analog transmitter directly into the main antenna, and the HD transmitter fed the auxiliary antenna. I removed the reject load from service and brought it back to Buffalo for repairs. I had many of these resistors used in the load as spares, so I checked each resistor individually to see which ones had changed dramatically in value. Once I identified the bad resistors, I went through my spares to see which ones would work to get the load as close to 50 ohms as possible. Once satisfied that we were presenting a good load to the injector, the wait was on for a good time to take the station down to re-install everything.

That ideal time came overnight of Tuesday the 17th of November. Landlord American Tower had scheduled all tenants on the Colfax Street tower to go down at midnight to enable the tower crew to map the tower. After we signed off at midnight, I went to work re-installing the plumbing from the Continental transmitter to the injector, and from the injector to the main antenna. All that was necessary for the HD signal was to move the position on the patch panel. After all the work was done, we waited for the all-clear from the tower crew. I checked the switch position before powering up to insure that everything was in its proper position, and applied RF to the antenna.

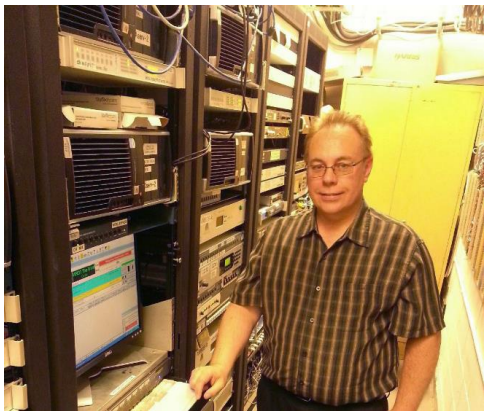
In a matter of a few minutes, I could smell burning from somewhere in the building. I immediately shut both transmitters down and began investigating the source of the smell. Satisfied that it was not a transmitter issue, I began to trace out the plumbing and found the culprit, the line section immediately following a 90-degree elbow on the output of the injector into the Dielectric switch.

Knowing that I could not put the stations back on the air with this issue, I immediately began disassembling the changes I had made earlier and plumbed both transmitters to feed the antennas directly. Once we were back on the air, I removed the Dielectric switch and found that port 4 was burned pretty badly. I had no option but to send it back to Dielectric for evaluation and repairs. I have not yet heard back from them, but do expect to receive the diagnosis soon.

Those about wraps up another month here in the great Northeast, and until we meet again here in the pages of *The Local Oscillator*, be well, have a Blessed Christmas and a Happy New Year!

The Motown Update
By
Brian Kerkan, CBTE, CBNT
Chief Engineer, CBC–Detroit

Happy Holidays and Merry Christmas from CBC-Detroit! There has been a lot going on here over the last month. We are working on cleaning up the WRDT(AM) daytime transmitter facility, which includes replacing all four of the tower base fences. Work has started, and I think we can beat the snow. The WRDT daytime transmitter site has a full studio setup that was used in the days of carts and reel-to-reel machines. I cleaned out a lot of the space and hope to setup some equipment that can be used in an emergency if needed.



I think itôs always a good idea to think through the ñwhat-ifò scenarios that can happen before they occur. Over the summer, the WMUZ tower was hit by lightning, and the WMUZ control room control surface was completely dead with a damaged CPU board. In a very short time, I was able to patch around the problem and return all stations to operating condition. We ran morning drive out of one of the other studios.

Before that happened, I spent some time thinking through the possibility of losing one of the major control rooms and what my options would be ahead of time. To be unprepared is to put yourself at risk for a large amount of time off the air. I was made aware of a situation recently at a

station in a major market that was off the air completely with dead air for an extended period of time, and was not able to air the morning show for TWO hours (this was not a Crawford station).

Our facilities today rely on new technology such as AOIP to deliver audio between studios and to our transmitter sites, but what happens when a failure interrupts that flow? A bad blade, failed power supply or network problem could really effect a market that hasn't planned for such an issue.

What can be done? Well it's always a good idea to maintain a second path for critical program. An example of a major single point of failure is the recent outage at the World Series that effected Fox. Although they had taken precautions and had a twin pack generator which should have provided redundancy, the generator still failed. Keep in mind, a twin pack is two generators in one package that should work independently. But in this case both failed. The production tracks went dark, including all of the computers used for graphics and local switching. The Fox truck also feeds the instant replay for MLB.

Although such a failure is ugly, I think Fox engineers did an incredible job of thinking quickly and taking action as soon as possible. They were able to patch MLB network program into the Fox network within a few minutes while switching to their studios to fill during the transition. The announcers went to the MLB booth and took over while the Fox trucks were rebooting and operation was being restored.

As it relates to radio broadcasting, have you thought through what would happen if you lost a critical blade, or several, due to a lightning strike? How would you get program around them to the transmitter? How would your automation deliver audio if you lost a computer and the network card that was used for your AOIP audio driver license?

Most of our plants still have copper pairs that are intact to several important areas within our facilities. I make sure I have one pair available and ready just in case. If I had to feed program directly out of the studio bridge card back to the transmitter, I could. I could completely bypass our digital blade system and stay on the air. Time is money, and lost listeners are hard to recover.

I am happy to say that the Wheatstone system has been rock solid, even with the lightning strike we had. Of course we have each Wheatstone blade protected by a UPS and ferrites on each one of the IO connections just in case. But even in a case of extreme failure, which can happen, it would be possible to feed program from a studio directly to the processing and get on the air while the other issues are worked out. Knowing what you have to work with ahead of time minimizes the time to implement a backup plan.

To the listener on the day of the lightning strike, that morning sounded like any other. Chris Stevenson did an excellent job putting on a show like all the others. No one on the outside would even be aware that the WMUZ control surface was already being dismantled, that the CPU board was already being removed, that a swap of CPU boards would occur immediately after morning drive was complete, and WMUZ could be directly patched direct through the flexible utility mixer built into our blade system.

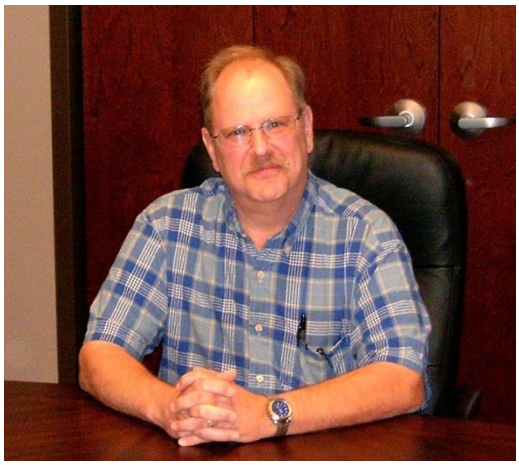
I was able to take the CPU board from the WRDT(AM) control surface that was the same type (G6) and swap it and its solid-state hard drive with the failed unit in WMUZ. I had the WMUZ surface back on the air before our noon talk show went to air.

This is what I love about what we do, thinking through issues, and keeping our stations on the air. I am proud to work for a company like Crawford with a solid engineering team.

Merry Christmas!

News From The South
By
Stephen Poole, CBRE, AMD
Chief Engineer, CBC–Alabama

Before thousands of studio pictures appeared on the Internet, the average listener imagined that our control rooms looked like the bridge of the starship *Enterprise*. Iôm not exaggerating. We actually had one listener, years ago, send us a drawing filled with dials and knobs and fancy displays. It was impressive.



Mr. Crawford certainly doesnôt skimp on the equipment that we use; he never has. We have great facilities. But we ainôt quite ... that. I mean, lots of Wheatstone AoIP and all, but ... well, you know.

Likewise, the average guy or gal on the street has no idea what a web or mail server looks like. They imagine some giant machine with millions of blinkie lights (like WHOPR in the movie *War Games*), if they think about it at all. Figure 1 shows our entire mail cluster ñtwo PowerEdge serverss and a little single-rack Barracuda spam filter. (The unlabeled box at the top is the Cisco router for Windstream MetroE.)

Figure 1 - The Barracuda, the mail server and our router/backup machine.

The truth is that most of the servers that youôll hit on the Internet, mail or otherwise, look very much like the ones that you use in your own job. A really busy site could have many machines in a cluster arrangement, but at the end of the day, youôd recognize them when you saw them.

Google, in fact, uses hundreds of thousands of commodity PCs with their own in-house version of Linux to do the clustering. They donôt even buy name brands; they use whatever is on sale that week. They have thousands of employees whose sole task is to maintain these individual servers around the clock.

While what we have is plenty nice, some people are disappointed when they see our mail or web server. (Again, see Figure 1 for our mail system.) Our Barracuda spam filter isnôt even that big. Itôs a little custom-built, single-rack-space job that doesnôt look like much of anything. The old version at least had blinky lights to indicate spam activity. This one doesnôt even have that.

What brings this to mind is the fact that weôve been migrating our web servers from various sites all over the country to one server in Denver. Itôs a new PowerEdge with gobs of memory and multiple processors, so it can handle the load. But it has been a real pain getting everything in place.

WordPress

This is the first headache. WordPress is a content management system (CMS) that can help you create a really good-looking website. Itôll work with all devices, too, from Smartphones to desktop PCs. WordPress takes care of all the squeezinô and resizing for you. You get a consistent-looking site regardless.

But to do this, WordPress must actually build web pages on the fly, on demand and on request. When you visit one of our sites, WordPress literally assembles the page from a database of content and sends it to you.

This is nice, but thereôs a downside. Since everything is stored in a database, the links and folder names are fixed. If you build a site on your local computer at 192.168.1.200, that IP address will be hard-coded into most of the links. When you upload the site to the actual web server, it probably wonôt

work.

There are migration tools that help ease this problem, but they don't fix everything. I can't tell you how many times I've blown up and reinstalled WordPress, or how many times I've literally poked through one of our databases, table by table, fixing these "hard" links.

Ideally, you'd install WordPress on the site in question and then start building; that's what it's optimized for. But if you're migrating a site, it's just not that simple. We (meaning me, Keith Peterson, Amanda Hopp, Todd Dixon and of course, Cris Alexander) have found this out the hard way in the past few weeks.

We also want to make everything look pretty: we want each browser's title and address bar to show "101wyde.com," for example, and not some weird-looking link with lots of strange numbers and characters in it. This is (somewhat incorrectly, by the way) included under the general heading of "Search Engine Optimization," or "SEO." It's a hot topic and no doubt we'll be fixing ugly links for a while, too.

DNS

Then you have DNS issues. I ran across this several years ago when we moved our mail server to Zimbra. It uses Postfix, which is anal-retentive about this. Postfix won't use an IP address like 209.248.190.246 (the actual address of our mail server); it only uses domain names and then looks them up.

What this means is that, while you're building things, you have to "spoof" DNS. You also have to spoof if you're building a server behind a firewall that translates IP addresses. For example, and in this case, our mail domain, mail.crawfordbroadcasting.com, is at 209.248.190.246 (as already mentioned). But internally, the Barracuda and the Zimbra server are on a 192.168.x.x subnet. Ergo, I have to actually spoof the DNS for Zimbra so that it thinks that "mail.crawfordbroadcasting.com" points to a 192.168.x.x address. It's a beautiful thing.

We've had similar fun with WordPress. See above again re: fixed links. This introduces a hilarious situation when you're moving a web server from one IP address to another. During any given transition, if you go to our main corporate website (crawfordbroadcasting.com), then click on Stations, then choose the site that's currently being migrated, you'd get a minimal, ugly-looking WordPress page.

But if you were to browse to that station site directly – say, by typing 770kcbc.com or 101wyde.com in your browser's address bar – you'd get the *old* site, the one on the current server. It got very confusing trying to keep all of this straight.

I think we did a pretty good job, though. There was some downtime, which is unavoidable, but I think that between all of us, we did as well as could be expected. The good news is that, as I write this, Keith Peterson is putting the final touches on the last sites to be moved, so we'll make our December 1st deadline. (Lord willing.)

Radio: Expensive

Finally, random thoughts and a repeat of something I've said many times here previously: radio is an expensive pastime. Many times over the years, I've met sincere, honest people who wanted to run a radio station (typically as a ministry) ... only to

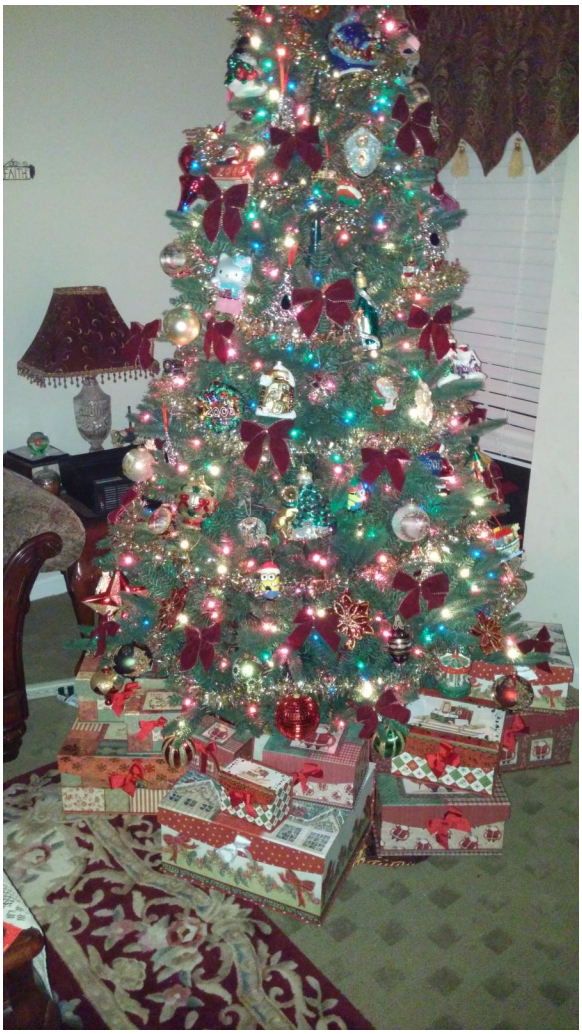


Figure 2 - My wife Sandy knows how to do a Christmas tree!

fail in short order because they had no idea how

much it would actually cost.

You know all about it, of course, from the BMI/ASCAP licensing (which is not trivial!) to the expense of relamping a tower. Nowadays, thank the Lord, we use mostly solid-state transmitters, so the cost of replacing tubes has gone down dramatically. But this is another thing that would get these sincere wanna-bes. The first time their old Gates or Collins transmitter needed some tubes, theyôd pass out when Iôd tell them the price. (Even for rebuilt tubes.)

As for relamping, thatôs what prompted this one. FAA regulations require that we use FAA-certified parts, which makes them very expensive. OSHA requires that all tower crews constantly tie off, which makes the replacement process last two to three times as long. Now, I certainly donôt want anyone killed around my towers; Iôve been blessed in that respect. (Iôve had towers fall, but Iôve never had anyone injured, thank the Lord.) I donôt want people working unsafely.

But as Cris likes to say, ñIt is what it is,ò and in this case, what it is is more expensive than ever. Just to repair the lights on WYDE-FMôs 1380-foot tower costs thousands of dollars for each climb. The tower crews can sometimes do a couple of the shorter ones (such as the 350-foot sticks at WXJC) in a single day, but the per-diem charge is still going to be many thousands of dollars.

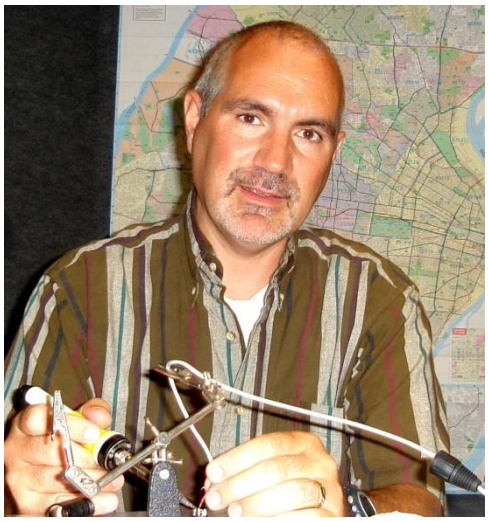
As I write this, WYDE-FM is still under a NOTAM. Weôve been waiting for an available crew for over a month now. WDJC is under a NOTAM as well, but we should have that resolved by the time you read this. Itôs always something.

Iôll finish with one other image, because Iôm a proud husband (Figure 2). My wife Sandy, in spite of being visually impaired, does the best job Iôve ever seen on a Christmas tree. Until next time, keep praying for this nation!

The Chicago Chronicles

By
Rick Sewell, CSRE, CBNT, AMD
Engineering Manager, CBC–Chicago

November is not usually a month in which you have much concern over thunderstorms, tornadoes and the associated power outages that come with them, at least not in this area of Chicago and Northwest Indiana. For us, last month was unusually warm and the price for that was shifting weather patterns where youôre in the sixties one day and then have an eight-inch snowfall two days later. It was that kind of month.



We had a few power outages during the month. Although we never want to go through them, we sometimes learn just how well our UPS infrastructure will hold up under a power outage. That short time period between the actual outage and when the generator comes online can seem like forever as you hold your breath hoping not to go off air.

We had that happen recently, and it was nice to see that the studios and rack room not miss a beat. No one listening outside the building would have known the difference. We did have one problem because one of the production rooms somehow didnôt end up having its equipment on a UPS. While that was the worse we experienced, we were able to remedy that to make sure itôs ready for the next generator event.

The event could have been different, as earlier in the month we had a UPS in the WPWX control room that was giving us issues. Even though the battery pack was only about a year old, the manufacturer told us it needed a new one. We replaced it only to continue to see the same issues. So, we replaced it with a new one. Thankfully, we replaced it before this recent power outage and the studio just kept on running during the generator transfer and retransfer.

Sometimes the things that help you, like a UPS, can sometimes hurt you, like a UPS. Thatôs

what happened this month at the WYCA transmitter site. We got the call that the station was off the air. We hadnôt received any alarms from the transmitter site, so that was unusual. When I got in my car, I noticed the transmitter was on the air but with no audio. Out studio engineer, James Kelly, had just left the studios for the evening and he had quickly returned and confirmed that we had audio on both STL paths. However, we could reach nothing at the transmitter site; the remote control, the web pages for the processor and transmitter were not available.

We knew there was not a power outage at the site since we could ñhearò the dead carrier of the transmitter. My guess was the equipment rack was dead without power most likely due to a tripped breaker or a UPS problem.

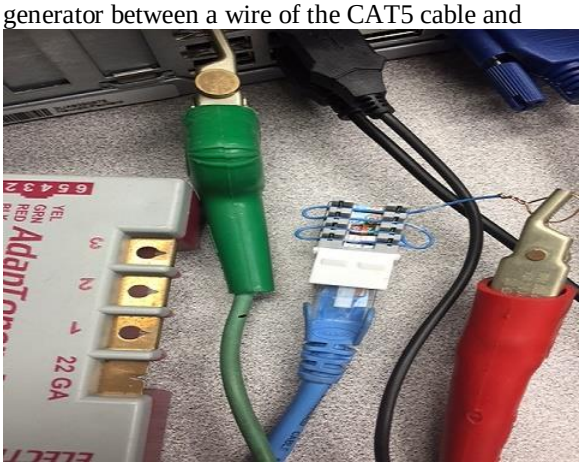
When I got to the site, before I could unlock the door, I heard the UPS squealing with an alarm. Once inside, I saw the equipment rack was dark. I saw the circuit breaker was not tripped at the breaker box, so the UPS was having an issue. I went to reset it and thatôs when I got a loud bang and the proverbial ñsmoke was let outò of the UPS. Since the unit was about ten years old it was time for it to be retired.

Thatôs the thing with having a UPS, it can certainly save you off air time and it is also very useful in protecting valuable equipment from power surges, but as I always say, ñEvery new piece of equipment added to your air-chain is just one more power supply that can take you off the air.ò In this case, with the transmitter site a little more than a half hour drive away, that downtime was somewhat significant. Still, all things considered, I feel a UPS is an indispensable part of our sites.

Valley Notes
By
Steve Minshall
Chief Engineer, KCBC

In a perfect world, all cables would be clearly labeled at each end, but I find that that is often not the case. Tracing CAT5 wire with a tone generator is not always easy if the tone generator is energizing a pair of wires. The cable pair twists are so tight and uniform that they provide a high degree of self-shielding, exactly what the twisted pair is supposed to do. Often it is difficult to get a signal detector to find the cable.

One trick that I use is to place the leads of the tone generator between a wire of the CAT5 cable and ground. This causes the cable to radiate the signal quite nicely. You can hear the signal when you get within a foot of the cable. The photo shows how this is achieved using a CAT5 jack. In this case, all of the eight wires are connected together, which is not necessary and actually is not a good idea, especially if the cable might be connected to a POE switch.

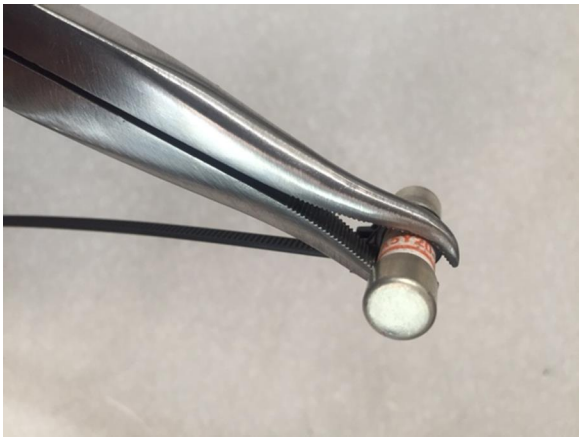


Now the problem is being able to tell which cable is making all the noise. If there are a bunch of cables bundled together, they all get coupled to the signal. Usually, however, you can find the one cable that is louder than the rest.

For the ground side, a computer case is convenient as in the picture. I have also used the ground in a nearby power outlet, I have an Allen wrench that fits nicely. It looks funny, but it works.

Another tool I have made recently is a fuse puller. The Nautel NX-50 transmitter has a bunch of fuses buried deep. They are difficult to see, much less get to. Having had a failure of one of those fuses, I needed a way to get them out. I talked to a Nautel technician and was told that there was no fuse puller that they could send.

A trip to Harbor Freight was in order. They



My custom fuse puller.

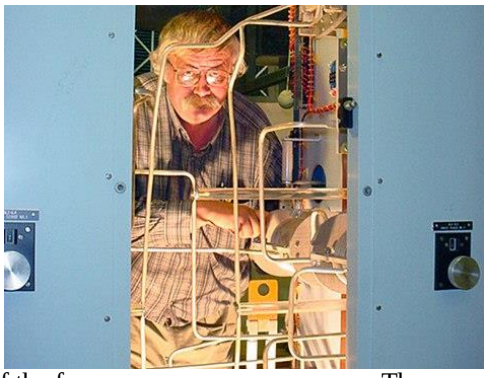
have these ridiculously long long-nose pliers that seem to have no practical use, until now. Pulling on a round fuse with the pliers in stock form was not going to work, so a little modification was needed. By heating and bending the tips, I formed a crude circle that would grip a fuse.

The tool worked well on the horizontally mounted fuse but was a failure on the vertical one. There was not enough room to open the jaws on the vertical fuse. Fortunately for me, the bad fuse was the horizontal one. If the other fuse goes out, it may be back to the drawing board. I understand now that Nautel can indeed supply a fuse puller, so I will be looking into that.

You may notice that there is a cable tie around the fuse in the picture. That is because I donôt want the trauma of dropping a fuse into the abyss and having to disassemble the transmitter to get it out. If there is a next time, I will probably put two cable ties on the fuse, one on each end, so that I can manipulate the position of the fuse better.

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

Black Friday this year also represented an end of an era as Radio Disney ended broadcasting in the Portland market. After more than 15 years of specialty broadcasting, Disney decided early this year to direct programming to newer internet streaming and HD secondary channel broadcasting.



For many years the Disney stations offered programming that focused on teen and childrenôs programming and music. While Disney occasionally received complaints from social conservative media, the Disney programming was one of the few alternatives to Howard Stern and the music(?) of Nine Inch Nails.

All in all Portland listeners will miss the Disney mouse ears.

That old rock and roll song comes to mind once again. Twenty-second verse same as the twenty-first, ñIôm Henry the Eighth I Am.ò By now that is getting old, really old. Really, really old.

In a previous report I described seeing the light at the end of a long tunnel as the FCC had notified a nearby tower owner that the tower must be detuned. The tower was one of several towers that were causing extensive distortion to KKPZôs directional pattern. That order provided a 30-day window to respond and a 90-day window to complete detuning.

We all cheered as the years of Special Temporary Authority (STA) appeared to be coming to an end. And then came the test of Job as the deadline to respond came and went with no response from the tower owner. After hearing nothing, I asked around to find that some work was being done at the tower. Not detuning, of course. They were instead doing extensive structural work to strengthen the tower and allow for more antenna installations. In theory, the tower might later be detuned.

The work includes changes to the tower footings and anchors. The old footings are being removed and replaced. This causes the tower grounding to be disrupted and results in intercepted current changes as the construction continues. In the meantime we have lots of wiggle-waggle in the KKPZ pattern, particularly on the 30 degree and 210 degree pattern radials. The KKPZ signal strength is subject to constant changes, mostly less and

definitely not more.

So one might be tempted to ask about that 90-day deadline. Well it turns out that apparently the envelope may have been misaddressed, resulting in a return to the FCC as undeliverable. The result is the tower now has an additional 180 days to detune.

With all that happening, of course, the next request might well be a request for KKPZ to reduce power in order to protect workers at the undetuned tower.

Meanwhile, there is news of progress with Oregonôs Broadcast Engineer credentials program. Just prior to the Thanksgiving holiday, the credentials committee met with Oregon Emergency Management to begin the final phase of establishing the program. Hopefully we may begin issuing credentials to allow engineer access to broadcast facilities during an emergency.

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

Phone System

November was a fairly slow month, and I must say it was nice. It seems like this time of year is often fairly slow as projects wind down. But we did have one big project to finish up, and that was the new phone system.

After placing the order in June, we finally got a port date of November 13. I shouldôve known that doing anything on Friday the 13th would be a bad idea. It was. We started getting the new phones on at 8:00 AM, which is what we were supposed to do. As 9:30 rolled around, the panic began to set in. We have a daily paid talk show on KLZ at 10:00 AM and Fridays are their call-in day. We had to have phones up and running for their show.

We were able to assign a DID (direct inward dial) number for the top of the KLZ hunt group and got the clients set up with it. They have a 1-800 number that forwards to whatever they want, and they were able to forward to the DID. Their guy was on it and got things set up so they didnôt lose anything.

We finally found out that phone service provider CenturyLink screwed up and they could not port our numbers. In fact, they couldnôt even see them in the switch. I guess there are two divisions within CenturyLink and they do not talk to each other. Somehow, the order for the porting was placed wrong internally, so we had to start the process over. We were able to use our old PRI system to get our old DIDs forwarded to the new ones so we could continue to use the new system.

After a couple weeks of going back and forth with CenturyLink, we finally got ANOTHER port date. December 1. It took several hours (and we had the same issue with the Friday 10 AM client show), but we got it done. We were then able to take the old system out of the rack.

The new phones themselves are very nice. Much easier to use than the old system. I am looking forward to learning them over the next few weeks.

Generator

We had a blizzard the middle of the month. It brought enough snow to make the Aurora area and areas to the south a mess, with several inches of snow and strong winds. Our sites, which are north of city center, did not get much snow at all.

I did, however, get an alarm that the generator at KLZ was running. I noticed the status was switching back and forth from running to not very quickly. After a few hours, it held solid as not running, so I assumed the power was back on and the generator had shut down.

The next morning, I had a nice wakeup call about KLZ being off air. I began troubleshooting and found the power was out and the generator was not running. I called Xcel and got the usual four-hour estimate. It seemed we were the only one who had reported the outage. We are basically all by ourselves out there power-wise, so it made sense. So I headed out there to see why the generator wasnôt running. I quickly determined we had run it dry.

Although the status said the generator was

off, it most likely ran all day and into the night. It is a huge industrial/locomotive diesel engine, and it only has a 140-gallon tank, so we have to watch the fuel situation very carefully. I called Wagner Equipment Company to come out so they could get it primed, bled and running again. Thankfully they were able to send someone out soon after I called.

While I waited, I knew weôd need diesel fuel, so I went to the local 7-Eleven, a place where Iôd gone before to get diesel. I learned a valuable lesson. After getting back to the site and dumping close to 15 gallons in the tank, I found that it was gasoline, not diesel. It would appear that instead of changing out colors at the pump, that 7-Eleven, just put midgrade there but left it green. I was in such a hurry and distracted with trying to get someone to the site I didnôt notice it said midgrade.

Thankfully none of the gasoline got into the generator. We were able to drain it into containers and fill it from the 50-gallon tank and pump in the back of our truck, which my dad brought out. It took almost three full tanks to top off the generator tank, but we got it done.

After a good day of work, Wagner was able to get the generator to purr. Thankfully we found the service and operation manuals on that old engine in a file cabinet at the site, since there is a special way the fuel filter and injectors have to be bled.

But then we had a new issue: it would not turn off from the controls on the transfer switch and controller. The only way to get it to shut down was to move the valve train control lever from Run to Start, which essentially opens all the valves and allows the engine to freewheel to a stop. This was fine for the moment, though. It got us up and running, and if it were to come on, either Keith or I would go out and babysit.

My dad and I went out a few days later to troubleshoot this issue. Wagner thought the issue was in our transfer switch which they do not work on. We found the really old schematic and traced it out, or more like my dad traced it out while I stood there freezing, and determined after some troubleshooting, that the issue was with the shut off mechanism on the injector pump, not the transfer switch. We did a few things, tested it out and it seemed to work. We will make it a point to run the generator for a good amount of time on our next few trips and see if it works. If it does not, we will have Wagner back out to work on the issue.

While dealing with all that, we cleaned the relay that provides the run status to the Burk remote control. That status indication is now steady, so we should know for sure when the generator is running. I also filled the diesel tank in the back of the truck and left it parked in the garage at KLZ, just in case.

I pray everyone had a wonderful Thanksgiving and that you all have a very blessed Christmas. That about does it for this edition so until next timeé thatôs all!!!

KBRT • Costa Mesa - Los Angeles, CA
740 kHz, 50 kW-D/0.2 kW-N, DA-1
KNSN • San Diego, CA
1240 kHz, 550W-U
KCBC • Manteca - San Francisco, CA
770 kHz, 50 kW-D/4.3 kW-N, 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
WDCX • Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2
WDCX-FM • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDCZ • Buffalo, NY
950 kHz, 5 kW-U, DA-1
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT
WEXL • Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT
WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT
WYRB • Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT
WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND
WYDE-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT
WXJC • Birmingham, AL
850 kHz, 50 kW-D/1 kW-N, DA-2
WXJC-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

Crawford

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