The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

AUGUST 2018 • VOLUME 28 • ISSUE 8 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR

1984

My wife and I were talking recently about how much the world has changed in our lifetime. The context was a song that came on the radio, "Telephone Line" by Electric Light Orchestra. It's a great song, but we were amused at how millennials wouldn't understand the lyrics at all. What's an operator? And how can you let it ring a little longer… longer… longer… longer? It should go to voice mail. (And who calls anymore? They just text.) The same thing can be said about Jim Croce's "Operator," Dr. Hook's "Sylvia's Mother" and any number of other songs of another age.

Phyllis and I had a good laugh about that. Our adult grandkids wouldn't get it, and even landline telephones are an oddity to today's youngsters.

Tower work is a lot different than it used to be, with real-time high-resolution drone video.

The 15th of last month, I celebrated my 34th anniversary in this job (and somewhere around there, my 42nd in this business), and it occurred to me that the world was a decidedly different place in July of 1984. In those days, on the return of my desk sat an IBM Selectric typewriter. In my desk drawer were two colors of Liquid Paper – white for ordinary paper and buff for company letterhead. I had a calculator on my desk and a slide rule and polar planimeter in the drawer (I still have the slide rule and planimeter and I know how to use them!).

All of my allocations work was done manually. I used Dataworld to do channel searches and pull the list of stations on an AM frequency, but that was just the starting point. I used the F(50,50) and F(50,10) charts for FM contour distances and the groundwave curves for AM, and I had a full set of M3 ground conductivity charts from which I pulled conductivity breaks (I still have those charts). Data was pulled and interpolated from the charts and I used a pencil, ruler and protractor to calculate, plot and graph the results. Coverage maps and contour studies were done in pencil, then the pencil marks were precisely inked with drafting pens that used India ink. I had a French curve that I used to help me make pretty, curved lines connecting contour points. Labels were made on the typewriter, boxed in ink, cut out and affixed with glue.

It took days, sometimes more than a week, to do a complex daytime allocation study. Night limit studies were a little easier and faster since they were, for the most part, point-to-point and did not involve contour calculation and mapping, but if there were a class I station (this was before they started calling the clears "class A"), I had to plot the groundwave and skywave contours on a map, measure the distances to the contour and back-figure the maximum IDF. It was sometimes excruciating work, but it was also very satisfying.

Even my administrative work was way different than it is today. My primary tool was the telephone, and we paid by the minute for long distance – and I had to log all my calls for accounting. Follow up was done in writing by letter. That IBM Selectric was clacking away eight or more hours a day many times.

If I needed to talk to one of our engineers right away and he wasn't in the office or by the landline at the transmitter site, I would call his beeper (remember those?). He would then have to find a pay phone (remember *those??*) to call me back on, using a calling card for the long distance.

I travelled a lot in those days, making site visits to see how things were doing. I did this to look at directional parameters, transmitter operating parameters, audio levels and modulation.

Tower work was also different. The more sophisticated crews would carry a Polaroid camera in their bolt bags and take photos of items/areas of interest, and they would show them to me when they got back on the ground. But I had to be there, on site, to see the photos, which often weren't very good.

Life really was a lot slower in those days, but it was also a lot fuller.

Contrast that to today. I have two computers – a desktop and a notebook – on my desk, and the notebook goes where I go. Those computers are loaded with powerful word processing and number crunching software; there's no need for Liquid Paper, slide rules or planimeters anymore.

I have all the FCC dynamic databases on those computers along with powerful software that allows me to do allocation studies in seconds. The most complex AM groundwave or skywave studies take no more than 15 seconds or so, and FM channel studies are virtually instant. Groundwave curves are contained in U.S. and Region 2 databases for instant recall by the software, and FM propagation charts are digitized. Need a coverage map? Give me a minute and I'll have it done, in living color. I'm not exaggerating here – I can do more in 15 minutes today than I could do in a *month* in 1984.

Today, my primary tool is email. It's fairly rare for me to pick up the telephone and make a call. That's usually reserved for something that needs discussion right now. But even when I do pick up the phone, there are no long-distance charges or logs – we have 5,000 minutes per month of included nationwide long distance with our SIP trunk. If I need an engineer in a hurry, I text him or her, or call his or her mobile. No need to page and wait for a callback, and our engineers don't have to carry quarters for pay phones.

I travel very little these days. The primary reason: I can virtually do most of the things that I once had to do in person. Right now, sitting at my desk, I can use either of my computers (or my iPhone!) to connect to a site and look at remote controls, transmitters, audio processors, STLs, modulation monitors, antenna monitors, even HVAC systems in some cases. Transmitter interfaces are so granular that I can look at individual power amplifier heat sink temperatures and fan speeds right here at my desk (or anywhere). I can track trends and look at event logs. Unless there is something physical to do at a site, I don't need to be there.

Recently, as we chronicled in these pages, we installed a batch of new audio processors throughout this company. While our local engineers did the physical equipment swap, I was able to remotely connect to the new processors and modulation monitors and precisely set modulation, pilot and RDS levels. This was after remotely loading format-specific presets from my office computer to the new processors, insuring that the stations would have the signature sound we are looking for.

I can even use my iPhone, desktop or notebook computer to connect to any audio source in the Wheatnet systems of many of our studio facilities and actually listen to that source audio with excellent fidelity.

And as for tower work – a climber can email me photos taken with his phone while on the tower and I can provide him with an immediate response. In several markets, our engineers are FAA Part 107 licensed remote UAV pilots and can observe tower work from altitude in real time. They can Dropbox high-resolution photos and 4K video to me, so I can even independently look over he shoulders of tower workers.

It really does boggle the mind when you think about it. Choose any other period in history and you'll find more gradual change. Even during the industrial revolution, from horses to steam power took decades, and the full transition from steam to diesel took more than 20 years. But from IBM Selectrics to Microsoft Word happened almost overnight.

My grandkids may not get "Forty cents more for the next… three… minutes" any more than today's IT techs understand tube-type power amplifiers. I am grateful for smartphones and solid-state PAs, but I'm glad I had the opportunity to have experienced the transition. It's been a heckuva ride these past 34 years. I can't wait to see what comes next!

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

Hello to all from Western New York! It has been quite some time since we last visited here in the pages of *The Local Oscillator*. Last month, just as the deadline approached for publication, we experienced a power surge at the WDCX-FM transmitter site, which caused a considerable amount of damage to various equipment within the plant. As getting us back on the air took top priority, there just wasn't enough time to put together my column for the July issue. Therefore, this month's report will encompass two months of activities in Western New York.

Like most of the country, we in Western New York have experienced extremely hot and dry weather conditions for the past several months. In a normal summer, we occasionally reach temperatures near 90 degrees, with a few days that the temps will creep into the low 90s. This year has been the exception. To date, we have noted eleven days with 90-degree or higher temperatures, with little to no rain.

There is one good outcome to this scenario – the vegetation does not grow rapidly with the lack of precipitation. The down side is that with all the heat and humidity, air conditioners are running 24/7, causing extreme drain on the electrical grids with the demand being considerably higher than normal. We have incurred three instances of brown-outs since the heat wave began, mostly in the Rochester area, although Buffalo has seen its share of electrical supply issues as well. Thankfully it has not affected either our transmitter sites or studios.

Weather forecasters do not see any immediate relief in sight, so to protect our properties from the possibility of wildfires, I am keeping the tower fields cut very short; if a wildfire were to start, there will be little to no fuel in the way of dry vegetation to cause any significant damage to our properties.

As I mentioned in my opening remarks, we experienced a power surge on one of the three phases that feed the WDCX-FM transmitter site. Late on Friday afternoon, June 22nd, I received an alarm from the Burk remote control system that the station was off the air. I immediately dialed into the remote control and was able to bring up the Nautel NV-40, although I noted that the power output was low and there was no audio. I then shut down the Nautel and put the auxiliary transmitter on, again noting that there was no audio. I was unsure whether the STL had failed or the audio processor, so a trip out to the transmitter site was warranted.

Once I arrived at the site, I noticed the stench of burning electrical components in the air, so I knew instantly, this was not going to go well. I first brought up the Nautel transmitter and found that one of the power amplifiers was in fault mode, but most notably, the Omnia.11 audio processor was showing hundreds of colored lines across the screen. I tried several "hard reboots," but the processor would not come up.

We have an Omnia.6 processor on our HD-2 audio chain, so I planned on pulling this processor out and replacing the dead Omnia.11 with it. Murphy's Law: it was dead also! In order to get us back up, I had to drive back into the city and remove the Omnia.FM from the studio backup analog STL and install it at the transmitter site. This took care of the audio issue, so now on to the transmitter's PA module.

I found that the IPA module had failed, therefore providing no drive to the eight power amplifiers that make up the PA module. I replaced the bad card, re-assembled the amp and placed it back into service, only to find that one of the PA cards had also failed. So, I had to pull it back out and replaced the dead PA card. That took care of the transmitter issue. Now on to the composite DA, which luckily only had a blown fuse, as was the case

of the Modulation Science composite clipper. I also noted that one of the modules in the surge suppressor was showing a fault; in all probability, the fault leg was the phase that incurred the surge.

In order to get our station back up with full services, I contacted Telos Omnia and had them ship a loaner Omnia.11 to us so we could get our HD-R signals back up while our failed processor was in the shop for repairs.

Not to be outdone, this month, right as the deadline loomed for this month's publication, we had a power outage at the Rochester studios which affected WDCX(AM) and WLGZ-FM. About 200 feet from the studios, a very large tree fell across the road, taking down the power lines, telephone and cable services also. Although only one phase went totally out, Rochester Gas & Electric had to shut down the entire feeder so repairs could safely be made to the lines and damaged poles.

We have a portable 13.5 kW generator for just circumstances as this, and I immediately began to run the necessary cables to key equipment to get us back on the air using only the audio servers. Each time we plugged in one of the extension cords, it would pop the generator's circuit breaker. Thinking we had a bad cord, we exchanged it with another, same results, breaker popped! Then, the gasoline engine began randomly shutting down. We were able to start it back up immediately, but after running for a few minutes, it would shut down again. A quick check insured that all fluid levels were okay, so there had to be something within its electrical system that was causing it to shut down. It had not been too long ago that we used this generator with no issues, so I am at a loss as to why it failed. We have an advertiser who specializes in gas engine and generator repairs, so we will reach out to them to get this problem fixed, before the next power outage occurs.

On Monday, July 16th, a commercial power outage affected the WDCX(AM) transmitter site. This time, the Generac propane-powered generator did not come online when the power went out. It took me a little over an hour to get there from Buffalo, but I immediately found the cause of the failure: no coolant in the radiator! This was caused by a bad ¾" reinforced rubber bypass cap on the water pump.

Knowing this is a known point of failure, I keep several of these rubber caps on hand at the transmitter site, and quickly replaced the split cap. After replacing the lost coolant in the radiator, the generator was able to come up and supply power to the plant for the next seven hours until commercial power was restored. It had been barely over a week since this generator was used with no issues, so I am guessing that the bypass plug failed during an unattended exercise cycle that occurs weekly.

The remaining summertime and fall promise to be a busy time for us, as we have several projects planned and/or underway for our Western New York stations. I will be installing equipment for both our AMs to broadcast on newly-acquired FM channels in our Buffalo and Rochester markets soon. The equipment, including transmitter, audio processor and RBDS unit, have already been installed and wired up. At this point, we are waiting for the antenna to be shipped, which should happen at any time. Don Boye of Western Antenna & Tower will be installing the new feedline and antenna once it arrives.

Also pending is a new STL system for WDCX-FM and WDCZ. The new system will replace our aging 950 MHz Moseley STL system with an IP-based Part 101 6 GHz link similar to what many of our other stations are already using with great success. I am looking forward to learning about and installing this new equipment, which will allow us greater flexibility in routing our audio to/from transmitter sites.

Just recently, I received a new remote control system for WDCX(AM), a Burk ARCPlus Touch, which will replace the obsolete and unsupported Burk VRC-2500 remote control. The VRC-2500 has served us well over the years, but it is not worth taking the risk of an impending failure with no chance of obtaining replacement parts to keep it going. We currently do not have internet service at this transmitter site, but I will be contacting Frontier Communications to see if internet services may now be available, as the area around the transmitter site outside of Rochester, has seen significant growth within the past two years or so, with several businesses locating near our transmitter site.

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

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

Greetings from the Motor City! July has been a very hot month, with many outdoor projects underway.

I recently had an opportunity to use our drone for a tower survey to assist in the structural analysis for a translator antenna we intend to install. This exercise made me a believer in the true value on having a drone available as a tool. The video and photos captured are very good quality, and we were able to capture the information quickly.

We made several improvements to our WCHB transmitter building which included a new roof and gutter, and a new exterior door. We also cleaned up around the site. There was an old ATU that was nonfunctional that we unwired and removed.

Our new Nautel J-1000 transmitters are working well at WCHB and WRDT, and they sound great. It was nice to clean out the racks and install new gear.

We had our annual all-day blood drive live broadcast with morning drive, Bob Dutko's talk show, and afternoon drive. We were able to show how local radio can be effective in the community. We helped the American Red Cross break a previous record.

We have been using our IPad equipped with the Tieline Report-IT app quite a bit, for the fairs and any time we want high-quality call ins. All the gear fits in a backpack that the air talent can take with them.

I am in the process of converting our Part 101 microwave link over to a 48-volt DC configuration. We will be installing a 48-volt UPS at the tower base and running all the electronics on the tower off of the DC supply. The Trango Part 101 radio that we use has a long boot up time. While we have been using a standard UPS to provide backup power to keep the unit operating during power events, this 48-volt UPS could provide a better overall solution.

We have had a few storms as of late, and a power surge caused the fuse for the Wheatstone control surface power supply to blow in the WMUZ control room. It is always a good idea to have spares on hand, and I do have a spare power supply for the control room consoles as well as replacement fuses on hand in case they are needed. Fortunately, the fuse was the only thing wrong, and we were able to restore the studio quickly.

When the failure occurred, we simply routed the automation through the Wheatstone blade. Downtime was minimized, and configuration is easy. We are setup to route our auxiliary control room to become the main at any time via a macro or through a defined function button on the console.

We have a bunch of projects we will be working on in the upcoming weeks, including the WRDT tuning house roofs, a translator move, and trying to get the City of Detroit to repair sinkholes in our parking lot. Engineering is never boring!

Until next month…. '73 from Brian, W8FP.

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

Another month has gone by with the usual A/C failures, storms, and other joys. After all of the runtime in June, our generators needed service, and all have been done except for the one at 101.1 FM in Cullman.

We're still finding and repairing damage that occurred in the storms in mid-June. Figure 1 shows what happens when lightning lets the smoke out of the power supply in a Dialight beacon. I'm going to see if it can be salvaged; hopefully, only the supply was damaged. This one came from tower #3 at 850 AM (WXJC) in Tarrant.

On the personal front, Sandy was approved for Disability from her job with the Social Security Administration. I deeply appreciate the folks who've been praying for her. Others have gone through this process, and it ranges from a pain in the rear to years of frustration. I thank God that ours was approved in about eight months.

We are also encouraged about possibly getting some relief from her leg pain. I took her to Emory University Hospital in Atlanta, and they're going to run a couple of very specialized tests. Either her artificial hip has begun to deteriorate, or something is wrong with her lower spine.

I could write a book about dealing with the Healthcare Hydra (and in fact, I recently posted a page on my Website about it). UAB and St. Vincent's here in Birmingham are both very fine hospitals with good doctors, but they haven't been able to help Sandy. Emory University is BFF's with the CDC, right next to it in Atlanta as a matter of fact, and I was amazed at how helpful they were. The physician's assistant who did the initial interview was as good as some of the gray-haired doctors here in Alabama.

But the question remains: why is it that these huge medical centers, which exist to treat very sick people, expect you to park a half mile away and then walk? Sandy is still sore from the trip, having to walk all over the place just to get to where she needed to be.

More Spam

Our Barracuda firewall sends me a report at midnight each day detailing the biggest spam senders as well as the names of those who've sent the most email in the past 24 hours. In July, I received a report that one of our users was sending out about 10,000 emails *per second*. Some quick investigation showed that this user had been hacked, so I had no choice but to suspend, and then delete, that account. There was a backlog of over 300,000 messages that hadn't been sent, and that had to be deleted. Later forensics showed that this user's computer had been taken over by someone in Poland. (!!)

Since most of our people will come to the chief or a staff engineer if they're having computer trouble, perhaps you can explain this to them. Back in the day, the most common vector for catching a virus was an infected disk or (later on) a thumb drive. In a few cases, just inserting a thumb drive was enough to get a nasty malware infection. Nowadays, it's usually email – something with a realistic-looking link to a bad website, or an attachment with embedded malware.

Another source, which I've mentioned in the past, is connecting to an unsecured network when you're on the road. Folks, *don't do that*, and please tell your people not to do that. If it's wireless, and if the network doesn't require a strong password, *it's not secure*. (Period.) If the password is posted on the wall, it's not secure! If all the Bad Guy has to do is buy a cup of coffee to get the password, and if he thinks he can get into your bank account, well … that's not a big expense to him, is it?

Figure 1 - The smoke escaped from this LED beacon assembly.

If you're in a hotel, be especially alert. Many of these networks are totally non-secured. The page that comes up when you start browsing is just a legal release so that you won't blame the hotel if you get hacked or hammered! The network itself is easily sniffed or tapped. Enter your password on one of these networks and a Bad Guy with a sniffer can easily steal your login information, then go to town.

Finally, there are the popup windows that may appear while browsing the web. Most of the ones I've seen have been amateurish at best – "You device gots five virus!!" – but you can't make the stupid pop-up go away. *Tell your people to kill the browser.* In some cases, you may have to use the Task Manager in Windows. On my Android's Chrome browser, I have to open second window, then close the one that's yelling at me. Even some honest-looking popups will, at best, install adware and other junk; the worst will load a virus or worm onto your Android or iPhone.

Whatever the source, to prevent our server from being blacklisted on the Internet, we have no choice but to take immediate, positive action. Sadly, in most cases, the only choice we have is to delete the account, wait a while (and ask the engineer in that market to thoroughly scan the user's devices), then recreate a new, clean account. This means that the user loses *everything* that may have been stored on our mail server.

Most mail servers aren't one monolithic piece of software: in fact, they are a collection of various modules. One receives the mail and another scans it. When sending, one queues it, and another module contacts the receiver and then sends it.

Those who write the malware know that their work will be soon detected, so it tries to send as many email as possible, literally a flood, for as long as it can. We have a module in our mail server that limits the number of email sent per second. Our Barracuda firewall then scans each email on the way out and will soon catch on if it sees a pattern. Like I said, fortunately (and thank the Lord!), thus far in 2018, we've avoided the blacklists.

When you're blacklisted, other mail servers will think that you're a spammer and may block your email. This means (obviously) that clients and AEs won't receive important messages, and it could literally cost us business. Therefore, it behooves everyone to scan, check, and exercise common sense when browsing and sending email.

I know that it's tempting, especially if you're running against a deadline, to connect "just for a moment!" to that wireless network in the local coffee shop, but if it's a non-secured network, you could be *hosed* in a matter of minutes.

Mail Server

And in the same vein, we have received a new file server to serve up email. Has it already been five years??? Wow. Time flies, dunnit?

Todd and I have been pondering whether to switch from Zimbra, our current email package, to something else. At the very least, we want to upgrade Zimbra to the latest version. This is always a long and arduous process, so I'm not looking forward to it, but it has to be done.

That's enough for this month. Lots to do, and there's no point in posting pictures of Todd and Jack staring at computers. Yes, we've been

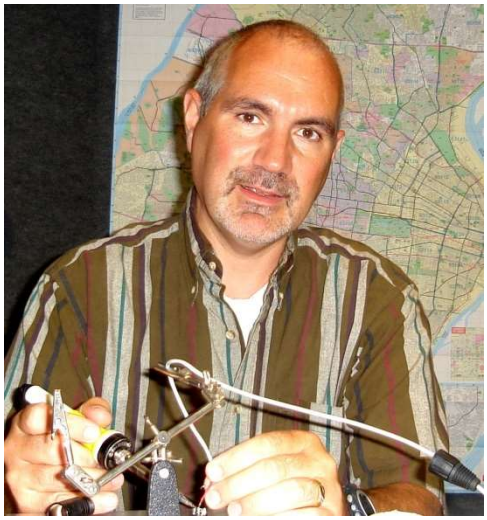
repairing/replacing several of those; they were damaged in the aforementioned lightning strike. My assistants are bulldogs who don't like to give up. The most recent example was a Dell Poweredge server that Todd wanted to resurrect. He ordered a power supply, but unfortunately, it looks like the motherboard was damaged. Oh, well. Sometimes you win (and Todd wins more than he loses), but sometimes you don't.

Until next time, keep praying for this nation!!!

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

Ticks

We have been having problems over the last few weeks where we hear a slight glitch in the audio on WPWX. They are so slight and quick that I'll call them "ticks." At one time they were quite pronounced, and you had to be listening inattentively to not notice them when they happened. At that time, they didn't happen but once or twice a day.



These are some of the worst problems to diagnose since they don't occur that often, they don't last very long and nothing in your chain shows errors or faults. It's rather obvious that it is some sort of digital glitch, but determining where it is occurring is the hard part. There are so many pieces of equipment along the chain, and they all have digital ins and outs.

Again, with the infrequent incidences, deciding where to spend your time listening along the chain is important. I always think in terms of dividing things in half. An initial clue, that later turned out to be false, information, was that the studio staff was not hearing as they were monitoring the program bus of the board. This meant it was further down the line.

To me, the best place to divide in half in our case was the point when the audio was leaving the studio on its way to the transmitter site. If we heard it happening there, we could save the time it would take to chase it at the transmitter site.

Using our Wheatnet outing system, I had my staff take turns listening to the audio going through what we call our "Bridge Blade" (the "bridge" between the TDM Bridge Router system and the Wheatnet Blade system). It is the last point in the chain before the STL equipment. Now with this happening every so often, if you get distracted, you could easily miss it. This seemed to be happening. I would hear about an occurrence from another staff member and then ask the engineer listening if he heard at the assigned listening point. They were often unsure. This lead to a lot of frustration, as I was still not sure if it was happening in the studio or the transmitter site.

I had to find a better way to pin this problem down, and using distracted engineers was not it. Since our Nexgen DRR (automation recording computer) was also on the Wheatnet system, we just needed to route the audio to the DRR to replace a human listening on a computer. I set this to record for most of the day. I then had my staff listen to the actual station signal. If they heard a tic, I asked them to email me the time.

I then used our tracking recorder, which records the actual air signal 24 hours a day, to verify what they heard. Once verified, I went to the DRR recording to see if the tic was in the audio just before it left the building. This turned out to be the case every time. This meant I could eliminate the transmitter site.

That still left me half the equipment along the chain in the studio. I changed the spot where the DRR was listening along the chain. I actually ended up using two channels of the DRR so I could have two different spots along the chain recording simultaneously. I again used humans to identify when they heard it on the station, and then again verified it with the tracking recorder. I kept moving backwards along the chain, and finally realized it was happening at the level of the ASERV (Nexgen audio server) computer, also known as the play-out machine.

Now that I knew at what level the problem was occurring, I needed to figure out what was actually causing it. There could essentially be three pieces of equipment that could be causing the problem: one, the computer; two, the associated ASERV PC Blade (Wheatnet audio driver) the audio was being routed through; and finally, the ethernet switch.

Rebooting the computer was the obvious and easiest thing to do, especially when the station has satellite time in the morning. We did that, and we saw improvement. We also rebooted the ASERV PC Blade and again saw improvement. We tried moving the network cables for each of the above-mentioned equipment to a different port on the switch with limited remedy. Eventually, we rebooted the ethernet switch.

All of this action had *some* impact on the situation. Certainly, the glitches are less pronounced and don't happen as often. At this point they are probably not noticeable to the average listener. You almost have to strain to hear and probably have to be listening for them to notice them. When I am listening, I often ask myself, "Did it just happen?" I figure, though, that if I am asking that question, it probably occurred.

Obviously, we're happier that we don't have a problem that most listeners would hear, but we are not satisfied with not having perfect audio. At this time, we are at the point of actual replacement of equipment. At the time of this writing, we have a new computer on the way to replace the play-out machine. I am hoping this is the cure and I believe it will be. I guess you would say we have guarded optimism.

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

Let there be light! For civil aviation that light is located on obstructions to aircraft, including broadcast towers. My first introduction to tower lights was an old coin silver contact beacon flasher. Over a few years, the contacts would erode and require replacement. Beacon lamps at the time were 650 Watt or 1,300 Watts for two. At 20 to 40 flashes a minute, the fact the contacts survived for any length of time was a wonder.

Complicating the equation is that the lighting circuit conductors were often lengthy, as much as 1,000 feet. The resulting reactive surge helps eat contacts faster.

Later came the ultimate flasher, with a self-repairing mercury switch. The mercury switch was later replaced by solid-state triacs, which worked well when reactive and surge loads were low.

Early on, several attempts to use solid-state flashers at KKPZ were unsuccessful due to reactive surge failure. Using a solid-state flasher to interrupt the beacon circuit with a high-current contactor resulted in the worst of both worlds – mechanical contacts that failed with time.

Some years ago, someone found a vintage Hughey & Phillips mercury switch flasher and installed it at KKPZ. Here, the term vintage means "old." It also means reliable, and that flasher has worked well for many years. The H&P designs have a well-thought-out, fail-safe design. For example, the H&P tower light controller contactor is

energized to turn off the tower lights. Any failure will result with the tower lights on.

In the separate H&P flasher, a sealed synchronous motor drives a complicated escapement mechanism. A rotating lever lifts an arm, which is then allowed to fall. The falling arm tilts the mercury switch, which interrupts the lighting power as it falls. That all seems a bit Rube Goldberg in design, except that any time the flasher motors stops the flasher faults with the lights on.

Which after 50 years it did as the motor failed and stopped. I can't complain. It has provided a good service life. However, replacement parts are not available.

So now I am back to an electronic flasher. the electronic flasher may work this time as the LED lamp load is greatly reduced, although the length of the run to the top of the tower is still long. The current waveform with the LED is very trashy, which complicates the equation greatly. In any case, KKPZ is being pushed into the electronic flasher age.

In other developments, I present in the photo above the life of a tower. At the American Tower Corporation #8110 tower, the pylon that held the FM antenna has been removed. The attached collage shows the life of the tower to the present. Now the challenge is updating the detuning apparatus to the new tower configuration.

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

I would say that July has been a slow month, and in some ways, it has. When it comes to needing to go to the various transmitter sites to deal with issues, it has been slow. I am always grateful that we have reliable equipment that, for the most part, just works. Most of the issues we had were minor and I was able to deal with them remotely or Keith took care of them when I was out of town.

A/C Failures

Air conditioner issues are something I can never seem to avoid. I do my best to make sure filters are changed, condensate drains are clear and belts are tight, yet things always seem to happen that are out of my control.

After having an alarm for both of the A/C units at the KLVZ daytime transmitter site, I headed over there to check on it. A simple power cycle seemed to fix it – for a while. I suspected that the unit was tripping off on high head pressure. Filters were replaced, but that did not help. We had our service company head over, and they ended up cleaning the condenser coils. This is one of two sites with no water, so any water needed for cleaning is hauled in. They brought in 50 gallons and power washed the coils.

As far as I can tell, things are working. On the hotter days, sometimes one of the two units will go into alarm but then resolve itself before I can get someone out there. So, we are in a holding pattern as monsoon rains have cooled things off a bit and we haven't hit the 90-degree plus temperatures in a while.

Many of the A/C issues we have tend to happen at inopportune times – isn't that the way it always seems to work? I was on a mini-vacation to Red Feather Lakes, spending time with my husband's family, when I received a high-temp alarm from the KLTT transmitter site. I checked, and sure enough, it was nearly 90 degrees in the building. I sent Keith out there and he didn't see anything obvious. The condensate drain was full of moths (surprise!!), so he cleared that out. He had replaced the filters only a couple weeks prior, so we were confident that was not the issue. He did what he could and called it a day. I went ahead and called the service company so I could be on the list for Monday.

They were able to come out that next Tuesday, and the tech was the one that typically works at that site for us. He decided to haul water out to clean the condenser coils. He got them cleaned up but found the condenser fan wasn't working properly. A few hours and a new fan motor later, things were back up, and our 90-degree building was quickly cooling down to the normal 72 at which I keep it.

Phones!!!

In the KLTT studio, for a long while we would have random issues with the phones not working on air. There is a phone interview recorded most every week by our station manager. They would make the call and he would talk to the person on the screener phone in the studio with no issues, but as soon as they'd put the call on the air, silence. It was intermittent. I would go into the studio and do a test for myself, and everything always worked perfectly. It took nearly two months before it finally decided to quit working altogether. Sure enough, talking on the phone works perfect, but as soon as it is fed through the console it wouldn't work.

After discussing the issue with Telos, I found the problem was the card inside the box. This is an Nx12 unit that really isn't that old. It is also the second of our three units that have died. Would you believe we still have an even older TwoX12 unit working with no issue?

Thankfully we had a new Hx6 system in the budget, so I went ahead and ordered it. It took a couple weeks to come in, and once it did, I was able to easily install it. The phone worked great until I installed the outsourced call screener program, "XScreen." This is a free program Telos says to use since they no longer make Assistant Producer to work with the newer phones. I installed the latest version and found that when it was running on the computer, the VSet screener phone did not work. I could call it and it would ring, but I could not pick up the phone. I could have the XScreen program route it on air, but the ringing from the VSet would not stop until I unplugged the phone.

Since we have one of these units in the KLZ control room, I went to their screener computer and had it route to the KLTT phone. It worked. The difference was the program version. Thankfully, I kept the older version and was able to install that instead, and once that was done, it worked great. Bionics, the UK company that make XScreen, told me I needed to have the VSet looking at the screener program and the Hx6 unit. I have not tried this yet, as I really don't want to rock the boat. I'm sure we'll replace at least one phone system next year, perhaps the Nx12 unit, and perhaps then I will try this method. Until then, I will leave it with the older version that clearly works (if it ain't broke…).

Computer Upgrades

We have been in the process over the past year of replacing the old 2005-vintage HP Nexgen computers in our studios. We rebuilt them a few years ago when we migrated over to the new Wheatnet system, but those rebuilds have begun failing. We did two audio servers the end of June, and in July we did the last audio server and two remaining control rooms. I am very grateful that this go around went smoothly.

I did the KLZ audio server replacement first. This one is the easiest one of all of them, because we are in satellite programming during the late morning hours. I didn't have to worry about using emergency control room (ECR) to keep the station on the air. I just turned the computer off, unplugged it, removed it and put the new one in. It came up working with no issues.

The one thing I keep forgetting is to set the audio sample rate for each WNIP channel to 44.1 kHz. Once I heard a spot that sounded off pitch, I quickly hopped on and fixed it. The next break went smoothly.

The control rooms weren't that difficult, either. The final two were the KLTT and KLZ control rooms. Control rooms and production rooms take longer, as once installed, I need to verify the recording channels. And since I don't have a setup in the engineering room to test this, I end up testing it in the studio.

The other issue that gets irritating is having to lock the wizard.ini (configuration) file. Windows 10 thinks it knows better and will overwrite things, so we have to lock it. What this means is, once the board op starts doing work, opening screens that are too big or trying to get the segue editor to display properly, I have to unlock it so they can get their settings right before I lock it down again. Thankfully, this is not a per-user issue; it's just a computer issue, so I have the person who does the most work in the room deal with it. They resize things to their liking and that is now the default.

Monsoon

The monsoon season is upon us here in Colorado, and not a moment too soon, either. As most of you have probably heard on the news, Colorado has been on fire. It seems everywhere there is a fire. Many areas have been under stage 2 fire restrictions, which pretty much means absolutely no open flame, period. Smokers have to do their habit indoors or inside a closed vehicle. This also preclude fires in fire pits, charcoal grills, and even shooting guns. I think it affected many campers and made the weekend trips to the mountains a little less stressful because there weren't as many people. These fire restrictions had us concerned though. Stage 2 is no big deal at our cabin, as we can easily cook our meals inside or on the propane grill and enjoy our time up there without the need of a late-night campfire in order to see.

We are preparing to go on our annual vacation to Lake City, Colorado in the San Juan Mountains, and the situation there has been no different than in the northern and central mountains (the "416 Fire" that's been in the news since early June was not far from Lake City). We have been closely watching things down there as we plan out our meals. At our Grand Lake cabin, grilling out is no big deal. We have a charcoal grill and a propane grill, so when the fire restrictions came down, we just used propane, which was allowed. In Lake City, charcoal is the only way. So, as we planned out our meals for the week in preparation for the trip, we were keeping a close eye on the fire restrictions.

Thankfully, the monsoon rains have begun, and the stage 2 fire restrictions have been lifted for many areas. The rains are also helping fight the fires, so the crews are getting things under control. The bad thing, though, is that some of the burn scar areas are experiencing mudslides, causing road closures. But I'm sure crews would rather deal with mudslides than a blazing fire any day.

The rains have also caused flooding around the Denver area. On July 23, we received nearly an inch and a half of rain in less than an hour at my house. There was a small stream rushing down the street. Many roads completely flooded, causing road closures as drivers decided to try to drive through high water and stalled.

Looking Ahead

As noted, I am looking forward to my weeklong vacation coming up the first full week in August. It is always a time of refreshment. When I return, we will be getting the carpet replaced in the Denver studios, which will be a bit of a headache but will no doubt make things look even better in the various studios.

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

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