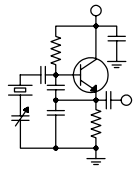
The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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NAB Time

It seems like I just recovered from the last NAB spring convention and here it is time for another one. NAB 2009 in Las Vegas will take place April 18-23.

This year's convention is shaping up to be a lot different than those in years past. The economy (or more accurately, the perception of it) has had a great impact. Many large broadcast groups are reportedly not sending their people this year. Registrations are down by a significant margin. I am slated to moderate a panel on Wednesday morning (4/22) on the new FCC AM antenna modeling rules, and some of my panelists have cancelled because their companies aren't sending them to the convention. That has made for some significant juggling of the lineup, but the one we've put together is solid, so this adjustment is really no compromise at all. More on that later.

The exhibit floor is going to be interesting. In years past, there has always been a theme, "The Next Big Thing" (whatever that happened to be at the time). For the past several, that has been digital radio, and we've seen many manufacturers position their companies and products around this. Nautel, for example, adopted the slogan, "Making Digital Radio Work." That was a good move for them, and it fit well with the quantum equipment advances they have made of late. But I wonder how that will play this year. Radio is, for the most part, in "survival mode" right now, and converting to digital operation is the last thing on anyone's mind. More on that later, too.

The NAB spring convention and Broadcast Engineering Conference is an event that I always look forward to and dread. It's a time of seeing folks that I only get to see once a year and of renewing old acquaintances. It's a time of making new acquaintances and putting faces with names and voices. It's a time of learning about new technologies, new techniques, new ways of doing things better and more efficiently. It's also a time of sore feet, long days, short nights and hectic schedules. The trip west is one of great anticipation, but it's never long before I look forward to the trip home with even greater anticipation.

Yes, this year's convention and conference are going to be different – probably less crowded, less hectic, and I'm guessing that there will be a lot less "buzz" on the exhibit floor. Maybe that's a good thing. Perhaps it will allow attendees to distill what's really important and focus on that, separating the hubbub from what really counts.

BEC Session

As mentioned above, I am slated to moderate a session on Wednesday morning. The session is titled, "New AM Technical Rules," and it is set for 9:00 – 11:00 AM in LVCC S228.

This session has been in the works since early last fall, right after the new AM antenna modeling rules were adopted. The idea was to provide attendees with an overview of the new rules and how to use them to lessen the regulatory burden of AM directional antenna licensees, to improve compliance (and lessen interference), and to reduce the costs involved in adjusting, licensing and maintaining AM directional arrays. We are aware that there are many misconceptions floating around out there with regard to the new rules, and we seek to clear those up.

The panel consists of some of the architects of the new rules, all members of the ad hoc coalition that drafted/proposed the new rules and drove the FCC rulemaking process, to wit:

Benjamin Dawson, P.E. of Hatfield & Dawson will present *Modeling AM Arrays*. Ben will discuss the practical aspects of AM directional array modeling, including calibration of the model to

impedance matrix measurements. He will provide some real-world examples and show us how it's properly done.

Ronald Rackley, P.E. of du Treil, Lundin and Rackley, Inc. will present *Internal Array Measurements for Modeling*. Ron will explain how to properly make the set of impedance measurements that is the foundation for a calibrated moment method model and properly adjusted modeled array, and he will discuss the biennial recertification process. This is one area where there seems to be a good bit of confusion and misinformation. Ron will lay all that to rest with his treatment of this topic.

John Warner, VP of AM Engineering, Clear Channel Radio will present a real-world case study. John had the honor of being the first to file a moment method "proof" under the FCC rules and he quickly received program test authority. John will discuss the entire process from start to finish so that those of us who follow will have a good idea of the expectations and requirements.

After the three presentations, a panel Q&A session will take place. Panelists will include the three above individuals plus Glynn Walden of CBS Radio and yours truly. This will be the time when the experts can interact with the audience, answering specific questions and dealing further with any areas that need clarification.

I very much look forward to this session, to hearing the panelists and to the discussion. If you plan to be at the convention, be sure to mark this session on your schedule.

Survival Mode

If you read the trade press, it's hard not to come away with the impression that radio is in "survival mode" right now. In some ways that is true, but the reality is that radio continues to do well – just not as well as in years past. In my view, our industry is not so much trying to survive as it is trying to preserve the status quo. The same can be said for all segments of the worldwide economy.

No doubt about it, we are in a period of adjustment. Radio, along with just about every other industry, is adapting to the new reality. I'm no economist, but even an engineer can figure out that a good part of the problem for many radio groups is debt. The big growth of years past was fueled by big debt, and now that revenues have adjusted downward, that debt service is applying tremendous pressure. That, in turn, has pushed these groups to make internal adjustments, including layoffs. That, for many of the groups, is the new reality, and for them it really is "survival mode."

I thank God every day that our company has been a good steward of the resources He has provided. Our operations are, for the most part, lean and efficient. We have excellent technical facilities, upgraded to state of the art in recent "growth years" so that right now we are well positioned to ride out the new reality with what we already have in place.

Still, we must make adjustments, and we already have made some. Our engineers are aware of internal policy changes with regard to purchasing and travel. Going forward, we look to each of our employees to consider carefully everything they do, asking whether it makes best use of their time, company resources and money. Every week it seems, I hear from one or more of our people with ideas in this regard, and we very much appreciate that kind of thinking.

For us, I think "survival mode" really has a lot more to do with the long-term viability and relevance of terrestrial radio as a popular medium. As we ride out the lean times, we can't stop thinking ahead, considering how we can remain relevant – even indispensable. That is a good part of my job, and I look to our exceptional CBC engineering crew to help me with that. Keep thinking and floating ideas, remembering that you are part of the "brain trust" of our industry. It's with the ideas you and your colleagues develop that radio will not only survive but thrive.

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

Hello to all from Western New York! As our Nation's economy continues to struggle, I am amazed at the number of electronics retailers offering so called "Extended Warranty Service Contracts" on practically any electronic component or system sold on the retail market. Not long ago, I was in OfficeMax to purchase a $19 computer network card, and the salesperson insisted that I needed to purchase an extended warranty in case the card failed beyond the warranty period. I looked at the expressed warranty on the NIC and found the card was warranted for two years from the date of purchase. The warranty I was offered from OfficeMax was also for a two year period, beginning at the date of sale. Hmmm… it doesn't take a math major here to determine that this is a rip-off. Extended warranties on appliances and electronics are a huge business. *Consumer Reports* has concluded that these extended warranties are simply a waste of money because many products sold today tend to not break down during the first few years of service.

Consumer Reports analysts have reported that since these in-store warranties are so rarely claimed, the profit margins on them run as high as 40% to 80%. That can add a lot of pure profit to the bottom line of a business. Not only do the companies that offer the warranties profit, but normally the salesperson will receive a commission of 15% to 20% for making the sale. That's a pretty good incentive for both the employer and employee! The web is filled with complaints from consumers who purchased these plans, and when a claim was made to the issuing store, they refused to pay off. Taking them to court has proven to be a waste of time, as the company issuing the warranty wrote the contract and knows all its loopholes.

There are several things to consider when purchasing an extended warranty. The first is the original price of the unit. It doesn't make sense to pay an additional $15 for extended warranty coverage for a VCR that sells for $49.00 – it is a throwaway item, meaning that the normal repair cost would exceed the replacement cost. This is true for most televisions, (with the exception of LCD and Plasma sets) and many household appliances.

Secondly, a close look at the manufacturers warranty will spell out exactly what it will cover. As stated earlier, most products made today are so well made that the manufacturer's warranty won't be used nine out of ten times. Many of these extended warranties begin at the date of purchase. Therefore, you are not getting what you are paying for, because if the unit fails, the original manufacturers warranty will cover the cost of the repair or replacement.

The third thing to consider is the reliability of the unit you are purchasing. Does it have a proven track record of reliability? *Consumer Reports* tracks literally thousands of products annually, and reports are available for most any product sold today in the U.S. Doing a little research before you make the purchase can save you a lot of headaches later.

One exception to the above rule is the purchase of an extended warranty when a new vehicle is purchased. Many manufacturers now only cover the entire vehicle for a period of three years or 36,000 miles, whichever occurs first. Most auto extended warranties will extend the bumper-to-bumper coverage to 100,000 miles or seven years. However, you should fully understand the original warranty, as most auto manufacturers will cover the drive train of the vehicle for 100,000 miles against defects in materials and workmanship. This would include the engine, transmission and rear end of the vehicle. If considering the purchase of the additional bumper-to-bumper coverage, you can sometimes

negotiate the cost of the contract for a lesser amount, pointing out the fact that the manufacturer will cover the drive train well beyond the initial warranty period, therefore coverage of the drive train in the extended warranty would not be necessary.

There are a lot of companies out there that offer extended coverage on your new vehicle. I would not recommend accepting the coverage offered by the dealership. They are not the issuers of the policy, and they will make a commission on the sale, therefore if you deal with the company selling the warranty directly, you stand to save at least 10% on the cost of the policy. Shop around. This extended coverage does not have to be purchased at the time you bought the vehicle.

In this day and time, you have to look at every way to save money. Think hard before buying any extended warranty, and look at all the benefits, and make your decision based on logical or business reasons, not an emotional one when under the gun of a high-pressure sales tactic.

WDCX-FM • Buffalo; WDCX(AM) & WLGZ-FM • Rochester

On Sunday night, March 8, while performing an overnight backup of the NexGen file server, I noticed that the WDCX streaming computer was re-booting itself over and over. I shut the computer down and restarted it again, with the same results. This computer has had some issues since we had a hacker get into the system when it was first installed a couple of years ago. In order to get our streaming back up and running in short order, I pulled the VoxPro computer out and configured it for streaming. A call to Calvin at Liquid Compass went out at midday, and by late afternoon we were up and streaming again. Calvin reloaded all the SOS software and checked the entire system for reliability. He recommended upgrading the system ram to 1Gb from its present 512 MB of conventional memory. So far, the system has been running flawlessly with no problems.

Late last fall, we purchased a couple of new Gentner remote controls for the Rochester stations. The FM transmitter site had an old Gentner VRC-1000 voice remote control, and at the AM site was a Burk ARC-16 voice remote control with the optional AMI card for the tower phase/loop readings. I researched all options available to us and chose a Gentner VRC-2500 to replace both ageing units.

One of the main reasons I chose the VRC-2500 over the ARC-16 is that an external computer would not be needed to run the AutoPilot software on the VRC-2500; all of the control and time commands are configured in software using macros.

Not long ago, it was decided that WDCX(AM) would shut down at midnight each night and sign on at 6:00 each morning. I configured the remote control to handle this switching (along with the switches from day to night and night to day power) and am very pleased with the reliability of these units so far. They have been working as expected, with no malfunctions to report.

The only downside I have found with these units is the voice that is programmed into the units. There are five different voices to choose from, and none of them resemble the human voice at all. Gentner would do well to re-design these units with voices that are easier to understand.

With the winter weather finally over, we are looking forward to spring, and with it come plans to finally get the six towers at the WDCX(AM) transmitter site painted. We had this work scheduled for last summer, but the weather just didn't cooperate with us. We had a lot of rain last spring and early summer, which put the tower workers way behind in getting tower work completed. I have been in contact with Don Boye of Western Tower Service to insure that he has us scheduled to get this painting work done as soon as spring arrives and temperatures are at least 70 degrees. While Don is doing the painting on the towers, I will be doing some much needed maintenance work on the tuning houses at each tower. The soffit vents need to be replaced on each building, along with painting of all the wood around the roof and a general cleaning inside each enclosure.

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
Tom Gardull, CBRE
Chief Engineer, CBC–Detroit

I knew this year was going to have a lot of physical plant maintenance, if only because of the smaller capital expenditure plans. March has proven that to be true. I have dealt with more air conditioning issues than ever – and then the roof started leaking.

We solved the heat load problem of the new Nautel NV-40 transmitter in the FM transmitter room. Our HVAC contractor fabricated two metal hoods that fit over the grillwork on the top of the transmitter. These hoods, similar to what you see over a restaurant grille, connect to a 3,000 cubic feet per second exhaust fan which pulls the heat through ducts to the wall and then outside. Another opening was cut through the block on the other side of the room to provide make-up air.

We also added a 5-ton air conditioner which can come on-line if the ambient temperature rises too high, which it might during a hot summer day. We will no longer have to run the air conditioner all the time, which should present some savings on the electrical bill.

Before we had the new 5-ton unit, we had the old 5-ton unit. It is now vented to supply cooling to the equipment rack room which previously had no cooling at all, and with a removable panel could still supply cooling to the transmitter room. But it was not cooling at all. A bad compressor had been slowly failing and needed replacement.

A week after a new compressor had been installed, we had a warm day and needed cooling. But again no cooling and we could not turn off the fan. We had another repair visit. The problem seems to be a controller card failure, which caused some arcing in a relay, which welded shut one phase going to a blower motor, which ran all the time drawing too much current using only phase. So then the three-phase blower fan motor failed. Many replacement dollars later, we have our cooling back again for the equipment room.

Then it was time to ready the conference room for spring. We knew its air conditioning had failed last fall. HVAC unit #4 needed a new compressor. So this 2-ton unit was fixed. We also found out the reason its fan could not be turned off. A loose wire on the economizer never told the fan to shut down.

We have nine HVAC units on our roof. Two have recently had a lot of attention, and its only March!

Our roof leak is not big, but where it's located is the problem. An exhaust vent in the roof is directly over the ladies restroom. I can tell the area around the pipe has been patched before. We have a mostly flat membrane roof, but puddles can form in the uneven indentions which correspond to where the repaired flaps are. Water is getting under the membrane and dripping. I got some good rubber glue and have reattached each side of the patch. The next rainstorm will tell me if I have been successful.

Our tower climbers installed the last LED fixture on our FM tower. They had installed the middle beacon and sidelights last month, but we had to wait until a time we could shut the FM down with little impact so the tower crew could safely work at the top of the 500-foot tower. The previous two attempts were cancelled because of high winds and then a snowstorm back in February.

The success of the installation has caused us a new inconvenience. Because of the way the fixture is mounted sitting on a metal plate, we can no longer see the beacon at ground level. Our studio is located at the base of the tower, and the look angle is too steep to see the light. One must get about fifty feet away from our building to see the red flashing beacon. I have asked our late night operators to view the tower lights on their way into work each night. Our new lights look good.

News From The South

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

Since I first discovered it way back in the dark ages of computing, I've preferred email to a phone conversation. I have a written record of what was said and besides, I can order my thoughts better when I'm typing. I'm a fast typer (150-200 words per minute, last time I checked), so it suits me fine. But I've never been very keen on "texting" with a mobile phone in the past, primarily because my big, clumsy thumbs just weren't happy using a standard phone keypad to create a message.

That has changed. I've seen others use Blackberries and the like, of course, but most of these have had tiny little keys that were (for me) even worse than a standard mobile keypad. Now that Blackberry has introduced the Storm, though, I've joined the crowd and have fallen in love. The touch-screen has nice, big keys that even my thick fingers can whack with only a few mistakes. So... those of you with whom I regularly communicate have been warned: I have become a texting and mobile emailing fiend.

This month's column, however, is being written the usual way, on a standard PC in OpenOffice. Let's get started.

First: A Tech Tip

Locating a buried cable can be a pain; anyone who's ever tried to do it knows that from experience. This is especially true of buried lines at an AM site, which might have been in the ground for many years and which may be part of a group of cables. You want to get to the one bad one without damaging the others.

As I'll discuss next, we just finished replacing a badly-burned coax line at Tarrant this past month, so the problem arose again. Should I call in a cable locator? My experience with them has been less than stellar, and besides, they charge a good chunk of change for a few minutes' work and a bit of orange spray paint. After discussing it with Cris, we had an idea: why not just use the field strength meter that we already had on hand?

We took a signal generator and set it for 560 kHz (since there were no stations around here that were anywhere near that frequency). I disconnected the sample line to the tower in question at the transmitter building, then connected the hot lead from the generator to the shield. The ground clip was connected to building ground.

To my pleasant surprise, this worked like a champ. I took the field strength meter to the tower, pointed it toward the ground and walked around. I got a strong indication anytime I was right over the sample line. We brought in a backhoe operator, started digging and found all of the coaxial lines in a matter of minutes. Better yet, we were right at the end of the soil pipe that swept the

DFing the buried line

lines up under the ATU, and we were able to pull the replacement right through the pipe into position. Beautiful!

If you try this, it takes surprisingly little

signal, even with a deeply-buried line. Choose a relatively low frequency that's well away from any local stations and you're good to go. You'll also have to turn off your own transmitter while you do this, to prevent interference.

The other key is meter orientation. You already know how to aim a field strength meter: it's bidirectional, with maximum signal strength in the plane of the meter (i.e., to the "sides"). In this case, you point the side of the meter down, toward the ground. Don't swing it around; keep the meter at a fixed right angle to the ground and in line with the transmitter building and tower. Carefully walk around, watching for the highest indication and you'll find your line.

The Burned Line

Back to the original problem. Right after last month's *Local Oscillator* came out, another series of severe storms passed through Alabama. For days on end we had one storm after another with virtually no break. Normally, we have a chance to check for damage after a severe storm, but these were coming

Temporary Jumper for Tower 3

so close together we couldn't. Extremely high humidity was a factor, too. What may have happened in this case was that the ball gap at tower #3 in Tarrant had become worn from repeated lightning strikes.

Whatever the actual cause, on Friday afternoon, February 27th, WXJC took a direct hit that caused all sorts of damage. The biggest problem was that the 1-5/8" EIA flange at the input of tower #3's ATU cooked, melting and burning the line well into the ground. Other damage would need to be repaired: one of the slave relay boards at tower #4 burned up and a good bit of the control circuitry in the phasor was damaged, as were both +24V power supplies.

Not Good!

When something like this happens, the goal is obviously to get back on air ASAP with some real power. Tower #3 is the second highest-powered tower in the day array, so there was no way to easily bypass it. In fact, the first clue that something was wrong, as that last storm rolled through, was that we went off the air with a VSWR shutback. With that tower out of circuit, the system was just too far out of whack for the XL60 to handle even at low power (and that's saying something).

The solution was to go non-directional at about 9,000 watts, which protects our day monitor points while still permitting us to cover the Birmingham metro area. I had done this back in 2000 when we were rebuilding the system and knew that tower #5, the highest-powered, could do it with only minor retuning. Cris helpfully calculated the precise T-net values that we'd need, but as it turned out, I was able to get on air very quickly by simply moving the taps around for lowest VSWR on the XL60. All other towers were floated in day mode.

This left the night pattern. There was no way we could be legal without tower #3 in the array. To protect our monitor points, we'd have to reduce power so far that we might as well not be on the air. Fortunately, our nighttime common point input is only 1,000 watts, and we felt that we could trust what was left of the coax at #3 well enough (after cutting back the badly-burned part, of course) to use an RG-8 jumper. This took care of nighttime. Parts were ordered, plans were made and repairs began.

While we waited for coax and connectors from RF Specialties, I started repairs on the phasor.

The biggest problem was that the time-delay relays that are used to do the RF kill/switching function were both destroyed. I priced replacements and was discouraged at how expensive they were. I opted to save the company some money by using less expensive (and arguably more modern and reliable) Omron timers. While I waited for those to come in from Digikey, though, we essentially had to just wing it – we had to depend on the remote control to turn off the current transmitter, switch patterns with a direct closure to ground and then bring up the other transmitter, all with the damaged contactor interlocks bypassed.

The coax and connectors arrived, and after locating the cable as described above, we carefully dug down with a backhoe to get at the soil pipe that ran to the base of the ATU. We used Danny Dalton, a local contractor who's worked with us in the past. If it was cost-effective, I'd recommend him to everyone

Todd installs the splice

in the country for this sort of thing. He's an artist with a small backhoe, able to carefully dig down without damaging anything. Once we had the original line exposed, we checked it carefully for debris. Thankfully, the line looked nice and clean that far away from the tower base. Todd hopped into the ditch to do the splice while I replaced the connector at the ATU.

I purged and filled the line a few times to be safe, but we were able to get back up to a full 50,000 watts in Day mode the next day.

... And the STL Dropped Out!

As if the burnt coax and control circuits weren't enough, we've had a growing problem at Tarrant with the STL dropping out in high winds. This really became apparent during the non-stop storms, because we had almost constant gusty winds for weeks. The 6-foot dish is mounted atop a 50-foot creosote pole, and over the years, that pole has begun

Attaching the guys and stabilizers

to sway. We called in Southern Broadcast Services to attach guy wires and some stabilizer arms to the dish to help keep it on aim.

This problem had become so bad over the past few months that we were unable to make the LANLink work between Tarrant and Red Mountain, where the STL transmitter is located. After guying and stabilization, though, everything works fine again. Beautiful!

Then Barracuda Died ...

On the Friday after we finished the coax work at Tarrant, I got a call from Todd at the station. We were getting complaints that some people were unable to send email. He restarted the mail server and that seemed to take care of the problem. But by the time I got home late Friday afternoon, we were getting other calls: no one could send mail at all. Todd had already left for the day as well, so I headed back to the station around 8:00 PM.

When I arrived, the Barracuda Spam Firewall was completely dead and wouldn't restart. Not good. I had no choice but to take it out of line and expose our poor email server directly to the Internet, with no spam or virus filtering whatsoever. I trust our Scalix-on-CentOS server to be secure against crackers, but... wow. You all experienced it for the next few days, so you know what I'm talking about: one spam after another came flooding into the system and straight into everyone's inboxes.

If anyone ever needed proof that Barracuda normally does an excellent job, that should have done it. Sure, an occasional bad email will sneak past it, but in general, it's extremely effective. We briefly considered using an Open Source solution, but after

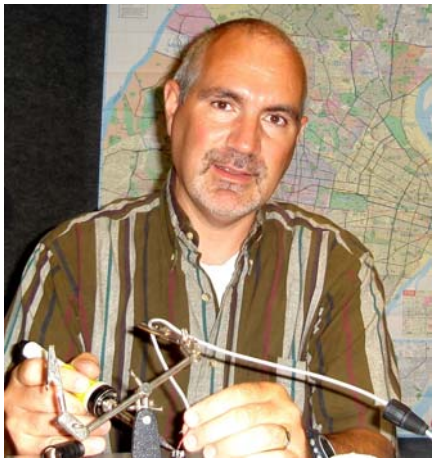
talking with Cris, we decided to order a replacement Barracuda 300. There's a higher upfront cost, but Barracuda's support alone is excellent and is well-worth the investment.

The new unit arrived and we installed it. Almost immediately, we noticed the difference: in just the first 20 minutes, it had already blocked hundreds of spam messages and viruses(!!!). We hadn't even tuned it for our needs yet and it was already cutting the junk by about 90%. We had some problems with Outlook users not being able to send; a call to Barracuda Support and several Web searches finally got those issues straightened out, and by the time that we headed home for the weekend, it was working beautifully. But for those of you who had to put up with all that spam ... well, I apologize, but like I said, it really makes you appreciate just how effective that Barracuda filter is when it's working.

That's it for now. I was going to rant a bit more about Open Source, but I'll save it for next time. Until then!

Gateway Adventures
By
Rick Sewell, CBRE
Chief Engineer, CBC–St. Louis

As we experience the effects of a struggling economy, in radio just like many other industries, we are all having to learn to do more with less. As I stated in the last month's column I have had to take on more duties in the operation side of the stations here in St. Louis.



I have been looking at everything we do here in order to make things run more efficiently. This meant communicating with all the employees involved in the operations, in this case mainly board operators because we have over the last four years shifted from having purely segregated roles of board operators and production personnel. The lines have blurred between these roles to the point that everyone is doing whatever it takes to get content into the automation system (production), making sure the automation system is running properly, and running the board during live content. The days of having an operator sitting at a chair to babysit the automation system are long gone.

With this in mind, I wondered how much more efficiently we could make the operations run when we had already had made a lot of steps to higher efficiencies over the last couple of years. I knew that there still was some wasted time but it is hard to eliminate all of it.

One of the first things that I noticed was the amount of time that it took to download many of the programs that are then converted and placed into the automation system. The way we get programs on the air has shifted drastically over the last decade and even more so in the last few years.

It wasn't that long ago most of the paid programs in Christian radio were delivered on cassette and board operators sat behind a control board 24 hours a day, playing them in real time. This had a lot of production and mailing cost for the ministries and certainly a lot of man hours for the radio stations.

Gradually, ministries began to shift to CDs from cassette. There was probably some savings in this for the ministries as duplication was much quicker and mailings were lighter. The main reason for this shift was the quality CDs afforded over cassette. For radio stations, this meant not only a better quality on-air sound but that programs could be loaded into the automation system much faster than the real time of the actual programs. A 30-minute program on cassette still took a station staff member 30 minutes of time to put it into an automation system plus a few minutes more to fill out the details on the computer screen. The time saved by going to an automation system versus playing the cassette live was negligible. With computer technology, a 30-minute program can be "ripped" into the automation system at much quicker time frame than the actual real time of the program, much closer to five minutes with the time it takes to fill in the data fields. Suddenly, the cost of purchasing, installing and maintaining an automation system made sense with the man hours

saved that could be realized.

Flash forward to the present. More and more ministries are now using FTP sites for stations to download programs. This makes a lot of sense for the ministries because the cost of maintaining an FTP site versus producing and mailing CDs is for sure a sizable savings. For radio stations, depending on how they are set up, the time saved may actually be a negative as opposed to a fast computer "ripping" in a CD. Because the files now have to be downloaded and in some cases converted to the file system that the automation uses, there seems to be a bit more time now involved in the program entry.

This is the observation that I made when I first began to get involved in the operation side of things earlier this year. I watched the operator/production staff spending a lot of time watching a download progress bar inch across the screen. Of course, much of this was done during the busy hours of the day when the Internet is at its busiest both locally and globally. So the process was dragged out even further.

I started thinking this over and thought that if you know the target FTP site and folder, this process of downloading the program should be able to be automated. In addition, if you could automate the process of conversion you would greatly decrease the amount of man-hours involved in getting the programs into the system. My goal with this idea was to have programs from FTP sites automatically downloaded overnight and also automatically converted to the automation system file format and sitting in a folder ready for entry into the automation system when staff came in during the day, thus making the process of getting FTP programs into the automation even quicker than CDs.

I set about searching the Internet for software that could do this. I found several that made some claims about automating FTP functions. Some of them were very expensive and some more reasonable. After evaluating different FTP automation software I was able to settle on one that was reasonably priced and seemed to be able to deliver what I wanted.

After getting the purchased approved, I have just begun to implement the use of the software. Like anything new, I have had a few bugs to work out, but we are working through them and I expect in the next few weeks to begin realizing the time savings. Hopefully by next month's issue, I will have more to report about this next step in efficiency.

Valley Notes

By
Steve Minshall
Chief Engineer, KCBC

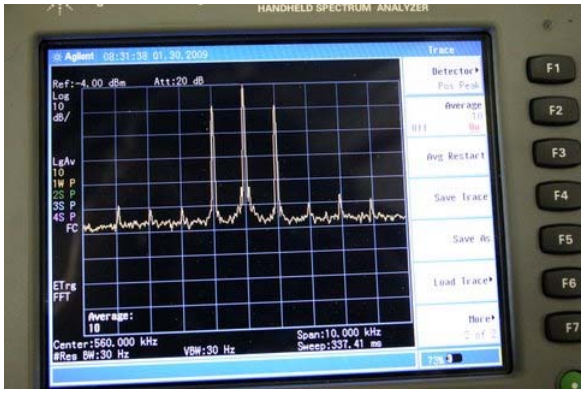
I feel like I have been saying the same old thing for years and years…"I'm really busy right now but there is light at the end of the tunnel!" It seems that the only light at the end of that tunnel has been a series of oncoming trains!

One of my latest broadcast adventures has been to prepare the KCBC Gates MW-1 transmitter for shipment to Honduras. When I first came aboard KCBC (KPLA at the time) we were using the RCA BTA-50H Ampliphase for our daytime power of 50kW and the MW-1 for night at 1kW. Following the installation of the new Nautel NX-50, there was no reason to keep either of the two original transmitters and both were decommissioned. I was rather sad about removing power from the BTA-50H, since it keyed so nicely on 7.040 MHz.

Before shipping out the MW-1 to Honduras, we needed to change the frequency from 770 to 560. Referring to the MW-1 manual, it was evident that there was a whole bunch of frequency-determining components that would need to be changed. I have

changed the frequency of other AM broadcast transmitters, but this would be my first solid-state transmitter conversion.

The first time I changed an AM transmitter frequency was about 25 years ago. The transmitter was a Gates BC-1T that I had bought for $200. It had been thoroughly abused for most of its life and then left outdoors to rot. It was tuned to 760 as I recall, and I had to put it on 1250. This was on the cheap for a construction permit that I held at the time. I needed two capacitors for the output network, .002 uF each.



"Pips" at +/- 120 Hz

There was a station in town that had a couple of capacitors on the shelf that were the right physical dimensions but were un-marked. What do you do when you have no way to measure capacitance? My solution was to build an R-C-neon oscillator. I built what essentially was a neon lamp flasher with a known capacitance and then substituted the unknown capacitors and counted the flashes. Bingo! I had found two .002 uF caps!

The other memorable thing about that conversion was the oscillator. Originally it had an 807 (that's a tube, look it up on Wikipedia!) and a vacuum crystal. I found a 1250 crystal, but the price was almost as much as I had paid for the transmitter, so I went another route. I bought three 2.5 MHz crystals for a few bucks and used a TTL divider (probably a 7490) and a transistor to drive the 807. I was worried about the frequency stability, so the oscillator went into the kitchen freezer and then into the oven, all was well.

I set the taps and roller inductors to the specs in the manual for 1250 kHz and very nervously pushed the *plate-on* button. I had paid good money for a set of 833A tubes, and I sure didn't want them to go flash or bang or whatever bad thing could happen. I was pleasantly surprised to see RF current on the load!

After 25 years, some things have changed. This time I had a spectrum analyzer, oscilloscope, and a network analyzer to help me out. It should be a piece of cake, right? Well, no, it turned out to be a bit more difficult this time around. In a tube transmitter, the output network has to transform a high plate impedance down to 50 ohms. In the MW-1, the output network combines 12 low-impedance modules *down* to a common bus with an even lower impedance of about 2 ohms and then *up* to 50 ohms. Component values tend to get very critical at 2 ohms. I had my banks of capacitors adding up to values very close to the book values, but just a hair short. This resulted in an output network that refused to tune at all. I padded the capacitors a bit more and put their values just over what the book called for. That did it, the networked tuned perfectly, probably better than it ever had at 770.

Ready to crate!

This was not the first frequency change on this transmitter, and I found that some modules had incorrect values of capacitors installed. This explains a lot of problems I had experienced over the years.

The MW-1 has 12 incandescent lamps used as fault indicators on each PA module. If a lamp is lit, it means that there is something wrong. Personally, I have never seen an MW-1 with all the lamps dark. I worked on the transmitter to the point where I had just two modules with lamps that had some glow. I replaced the modulator transistors on the modules even thought they tested ok with an ohm meter. It was an historical day, the first time I saw an MW-1 put out full power with all the fault lamps dark!

I was feeling pretty good about the transmitter and was anxious to pack it in the left over NX-50 crate (an old 1 kW transmitter just fits in a new 50 kW transmitter crate!). I felt like it was done… 1100 watts out at factory specs and no smoke! You can't send an AM transmitter out the door without modulating it. I put a tone generator on it and guess what…*big problems!*

This rig had been retrofitted for AM stereo and was not set up to receive a balanced audio feed. I found that the audio input transformer was missing. It was then I recalled removing that transformer about 14 years prior… now where can that thing be? I searched and searched for that transformer and finally found it in the production room. It was hooked up on a circuit that we no longer used.

With the input transformer back home in the MW-1, it finally had some decent modulation. *Cool…send it out the door!* No, can't do that without checking the audio performance. I put a tone in and looked at the RF output with a spectrum analyzer. Disappointment…I found the harmonics of the tone down only 30 db from the carrier…Yuk!

In this transmitter, the driver stage is modulated about 80%, so the adjustments of the driver stage will have a huge affect on the audio performance. I adjusted the driver voltage, driver bias (controls the percentage of modulation), driver tuning, and driver loading for best audio performance. The effect of the adjustments was outstanding, dropping the unwanted sidebands to about -50dBc. *Cool…send it out the door!* No, not yet – one more issue.

I noticed on the spectrum analyzer that there were pips near the carrier. Zooming in on the pips revealed sidebands at +/- 120 Hz, and down 48dB from the carrier. I figured that no one would ever be bothered by the small amount of hum that the pips represent, but since I found them I had to get rid of them. I found the power supply that was responsible. Suspecting a bad capacitor, I replaced it only to find no improvement. The fix turned out to be a resistor and capacitor added to the power supply, and that made the pips disappear. I wonder about that 120 Hz hum. I found nothing wrong with the transmitter or the power supply. Was that 120 Hz there from the factory? At -48 dBc, it should not have been able to pass an audio proof as done at the time of manufacture. In any case, I won't lose any sleep over it.

A special thanks goes to Charles (Buc) Fitch, who supplied whatever parts I was lacking for the frequency change, including a programmed TTL oscillator. The transmitter is going to a missionary station, so I pray that the transmitter arrives safely and provides good service to the station and the people it serves.

Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! It's that time again, time to say goodbye to another bizarre month here on the island and begin to wonder what new and exciting things will come this next month. As you may recall from my March column, I had been having quite a tough time troubleshooting and repairing our Nautel XL12. I am

glad to report that since my last article, this transmitter has been operating better than ever!

For the most part, this has been a pretty good and productive month here at our Catalina Island transmitter plant. The weeding job continues to keep us busy, but that too has a fix on the drawing board as we are preparing to purchase a

trailer-mounted sprayer. Spraying weed killer after we mow should bring this situation back under control. As things are now, the weeds continue to grow as fast as we can cut them. By the time we are finished with the job, it is time to start again back at the beginning. This is getting old very quickly!

So, it seems each month something strange has to occur here at the plant, or at least nearby. I emailed some of you after this latest "Island Zone" occurrence but have still not found any solid answers to this one. We were at the part of the weeding game where it was time to check inside the tower fences and as expected, some weeds had just begun to grow. It was getting pretty late, so I decided to come back down the following morning with a batch of weed killer to finish the job. I have a small manual sprayer that I use around the bases and anchors, but it is not real easy to lug around.

The following morning I filled the sprayer, pumped it up then drove down into the tower field. I got to the first tower, opened the gate and sprayed. All was okay there. When I got to the next tower I was shocked to find the entire gate missing! I looked all around but could find no sign of the gate or of any break in the perimeter fence, footprints or tire tracks in the mud.

I went back up to the building and checked our surveillance video, but it did not record anything except for a couple deer inside our fence all night. Though I do not have a cam that is able to see this particular tower (I do now), I can see all around it, so an intruder would get caught on cam somewhere on his way to or from this tower.

I got that Twilight Zone feeling that I am so used to up here and decided to put on some hiking boots and search for my gate. I followed the fence line, checking for any breaks or other signs of something out of place. Then, from the top of the hill, I found the gate as I looked down into a patch of tall weeds. The weeds were undisturbed and the gate looked like it had been set down right on top of them. None of the weeds surrounding the gate had been flattened and when I went to get it, the muddy trail I took to get to the weed patch had no footprints of signs of anyone or anything having gone anywhere near where the gate was sitting!

The gate was undamaged, the hinges were all still on the fence as well as the locked hasp. I could not find even one screw anywhere, yet the screw holes in the gate were still round and in good shape, not showing signs of the screws being ripped out. Right next to the fence where the gate entrance is, I had a pallet staked with roofing shingles. They were all still staked straight up, undisturbed. There were no signs of any strong winds, large animals or… UFOs!

The way things often seem to go whenever I try to leave the island, something must go nuts. Late last month, I had a pretty good list of things I needed to deal with on the mainland, so with everything looking good, I jumped on a boat. My first issue was my ongoing sinus problem. I have learned a few tricks to dealing with this one, however so, I got myself repaired and functional pretty quickly.

Then the barge line that just moved all my daughter's belongings to the mainland decided they could not hold everything for 5-days as they said they would do but instead required me to pick it up "right away." So now I had to flex and become a moving company instead of dealing with the things I had come over to the mainland to do. Well, I got the moving all done and out of the way. With both of my kids off going to school on the mainland, things are pretty quiet and I have a lot more room here at the transmitter plant.

I got back to the island for a meeting I had scheduled then regrouped and made another trip to the mainland to accomplish the things I had set out to do on the first trip. This time I got there, turned on the radio in the car and noticed KBRT's programming cutting in and out. I called my backup, "Island Mike," and had him check my satellite STL receiver. He found that all was well. I then got studio engineer Mike Duffy to the studio and he found a few things that he did not think looked right. There were faults on the uplink transmitter.

The following day, our studio sent our programming to Detroit via ISDN and they put it up on the bird while Mike Duffy did some troubleshooting of the uplink transmitter. He found a solder joint that didn't look right and reworked it. Either that fixed the problem or simply pulling that board and reseating it did. The uplink transmitter was back up and happy again.

So why the timing of this occurrence? Well, it's the Island Zone…

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

The Chicago Chronicles

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

Another Good Money Saving Tip

This one comes under the heading of "Thinking outside the box." The transfer switch box, that is.

I recently found out the hard way that the exercise clock on the Kirkland (WYRB) generator was dead. I learned it when the generator wouldn't start in the dead of winter because it hadn't run in over a month. Turns out that the clock's internal battery was dead. Oh, the clock will work since its main voltage input, 24 volts AC, is there, mostly, but the clock will forget everything it ever knew after a power failure until you trudge out to the site and teach it all over again. Way to design a clock, genius!

Once I figured out the problem, I pulled the clock out and tried opening it to find the battery, but no dice. That wasn't going to happen. So I put it back on line temporarily and re-programmed the thing, knowing full what would happen the next time the power failed. I then called the gen manufacturer and got a price on a new exercise clock: $481!! You can guess my reaction to that. No, don't. Next move: I looked up exercise clocks in the Grainger "phone book," but didn't find one which quite fits the specs – 24 VAC input with an SPDT relay output. Grainger doesn't have a clock which works on that voltage.

Then it occurred to me… we had just recently taken a 7-day timer clock out of service, one which had controlled the parking lot lights at the studio for years, and replaced it with a photocell. Well, the thing runs on 110 volts AC, and the output is also 110 to run the lights, but what the heck? I discovered that the second set of relay contacts on the timer, while meant to run the other side of a 220 volt line, were actually just dry contacts. In this application, the output 110VAC output contact isn't used anyway. Why not just mount this timer on the wall next to the transfer switch, plug it into the nearest electrical outlet, with the appropriate contacts tied to the transfer switch exercise circuit? Voila! An instant 7-day timer for exercising a generator for a half hour.

Well, not quite. The way the 7-day timer is designed, the minimum amount of time for an event to be on is an hour. If I wanted to exercise the generator for only a half hour, I'd have to get more creative. The plan, if I really want to do it, is to use the beginning of the "on" cycle to start an outboard timer, say one of those orange timer relays, which would run the gen for a half hour and then shut it off before the 7-day timer's "on" cycle completes. But that's no big issue, really. The beautiful part is that if the power does fail, the exercise clock will not lose its memory, it will just continue to perform the function, just a little later than before, and that's easily resettable whenever I feel like it. The cost? Well, $0.00, except for my mileage to take the thing out there to install it. Effectiveness? Better than on the old timer, because the generator will always exercise each week. Feeling of accomplishment? Priceless.

"The Looming Danger of Host Interference"

Radio World Engineering Extra is really an excellent way to get the technical side of the business into the face of us, the engineers, without blowing the minds of the management types who may also read the regular *Radio World*. But the lead article in the February 18, 2009 issue gives me pause. It's entitled, "The Looming Danger of Digital Host Interference," and it's main thesis, to the casual observer, is that effective levels of HD radio power, in relation to the analog signal, isn't good for you or your listeners.

Let me define "effective levels of HD radio power." That is the level where the HD signal can be heard out to the same distance as can the noise-free analog signal from the same station. For the uninitiated, we aren't there yet. Ibiquity designed the digital signal to go only as far as the -60 dBu analog contour, and they nailed it right there at the -20 dB digital to analog power limit. However, listenable analog (with some stereo blending) goes out much

farther than that. My experience indicates that analog blending occurs at about the -65-70 dBu contour. That's a major way of hearing the difference between analog and digital, which experiences no such blending. Just go out a ways from the station and listen back and forth. Trust me, it's worth the trip.

The genesis of this RWE article, actually a white paper written by Doug Vernier, president of V-Soft, came from a problem experienced by engineers at Minnesota Public Radio's KNOW in St. Paul where interference to the station's analog signal by its own digital signal, sometimes severe, was noted by station listeners living close to the station's transmitter site. It turns out that the two signals were transmitting from separate antennas on the station's tower, the analog from a 10-bay at the top and the digital from a single bay auxiliary antenna some distance further down the tower. Anyone who understands broadcast VHF antenna design knows that such a scenario is incredibly unsustainable since the vertical patterns for the two antennas are vastly different. That means that in many places near the tower, the digital signal will be much stronger than the analog. The graphs and charts which accompany this article bear out that conclusion in spades. Minnesota Public Radio, for its part, got the point rather quickly and went to high-level combining into the main analog antenna. End of problem.

But, and here's where the disconnect occurs, the article went from there to posit that an increase in allowable power levels of digital with respect to analog, as in from -20 to -10 dB *could* have a deleterious effect on everyone's analog signal as received by the masses. I find several problems with this conclusion.

First, this scenario, in my mind at least, tries to force us as engineers to accept that the worst designed radios, the ones most likely to be interfered with by the desired station's digital signal, should be the standard by which such a power increase should be judged. Sorry, I don't buy that. The worst of anything should not be used to judge the first. I know that this flies in the face of the public's vision that because they paid for their radio, it was somehow designed by God, but I'm saying it, and I'll let the chips fall where they may here. Decent radios (and that includes many car radios) should be the standard for judgment in cases such as this.

Second, the original KNOW-FM setup of operating with two different antennas for the analog and digital signals can work, *if and only if* the system of using two different or interleaved antennas is properly designed. That is no mean feat, because there's more than one consideration here. The obvious thing is that the two antennas must be closely matched in electrical characteristics, and mounted exactly alike, that is, on the same side of a tower which is identical in cross-section for both antennas, in order to transmit exactly the same vertical pattern. That will reduce if not eliminate pattern differences which plainly is the cause of the type of interference that the KNOW listeners (and listeners to other stations using the same method of digital transmission) experienced with their analog receivers when the digital carriers were on.

Third, and just as important, the two transmitters must each be RF-isolated from each other in order to prevent intermodulation problems which inevitably lead to interference issues not just within a station but between stations as well. That may not involve much heavy engineering, but the devices required to accomplish that, namely circulators, reject loads and the like, will certainly lighten a station's wallet, and that's not for the faint of checkbook. And there are also maintenance considerations involved which require the use of the talents of a competent engineer. All of this should be taken into account.

There is another way available right now to deal with this issue, of course, and new ways of transmitting HD and analog together will yet come. For now, the best way is to go with a combined analog/HD transmitter, and let all the worries go away. I have been involved with the first high-power combined-mode transmitter to go on the air, at our station WMUZ in Detroit. I've had a lower powered version in my stable for years, and for my money, that method is the best method. The technology is now such that if you buy one of these new generation high-powered combined-mode boxes, you won't need a backup rig, thus saving that kind of money. In fact, the new Nautel NV-40 is less expensive than its V-20 counterpart. Don't ask.

Finally, and here's where we have to start thinking out side of the box, we engineers had better start considering the idea of making the digital the more important part of the signal and relegating the analog signal to that of more the afterthought before the marketplace gets just that idea. The quality of the digital signal is so much better, and the potential for listener acceptance and thus revenue enhancement of both the quality and programming choice (with multicasting), is so great, especially with the possible demise of satellite radio as we know it, that HD may end up becoming the savior of terrestrial radio. I'm suggesting, and strongly, that we'd better start thinking in that direction, with an appropriate HD power increase, proper transmitter plant design, and HD extended band use to give all of our audio

sources the best possible sound
(not to mention the ancillary data services which are now closer than just "on the horizon").

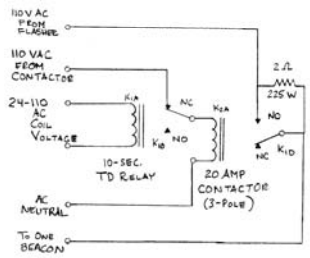
The promise of better radio is now the reality. The naysayers have had both their say and their day. It's now near the time to put our HD out there at higher power, promote it hard, and make it the standard of excellence in the public mind. Yes, analog FM is going to be around for a good while yet to be sure, but the marketplace is headed for digital and we'd better be there for them, or else. Period.

Saving Tower Beacon Lamps

Considering the quality of the beacon lamps we have hanging on our tower, anything we can do to extend their lives could only be considered a blessing. A recent discussion on the subject with our good friend Warren Shulz, CE at the Big 89, WLS, yielded a rather elegant solution. Warren is bucking the current tower lighting trends by *not* having those new-fangled LED beacons put on his 560 footer (he has only one beacon on that whole tower!). But he *is* into keeping his beacon bulbs up and flashing for as long as he can. The way it used to be done back in the day was to simply not turn those beacons off – which is how WLS did it for some 62 years! When Warren had all new lamp fixtures installed, he researched the electric bill, saw the light, or rather the charge of the light brigade (sorry), and got a photocell to turn the tower lamps off at dawn and on at dusk. That's when the failures started. How Warren solved that is intriguing enough so that the idea was subsequently published in *Radio Guide* some time back..

Basically, the idea was to cut out the high current rush into a cold filament at initial turn-on, which is the biggest cause of tower lamps losing their lives. He designed his system for an AM tower, and that increases the complexity of the implementation. I adapted his concept for the simpler situation of lighting a non-AM tower. The schematic you can see below. Pardon my crude drawing. I couldn't get the new drawing program I have to work quite the way I wanted, and time was too short to fiddle with it.

A ten-second time-delay relay is the secret, pulling in a contactor at startup, then dropping it out again. The tower lamp wiring is routed through the normally-open contacts of the contactor, and a two-ohm 225-watt resistor is hung across those same contacts. The contactor coil wiring is routed through the normally-*closed* contacts of the time-delay relay. With the AC voltage off, both relays are in their normally closed state but obviously, the lamps are not turned on. For the first ten seconds after turn-on, AC voltage flowing through the normally-closed contacts of the time delay relay pull in the contactor, putting the two-ohm resistor in series with the tower lamps, limiting their current as they, in effect, warm up to about three-quarters rating. At the end of the ten



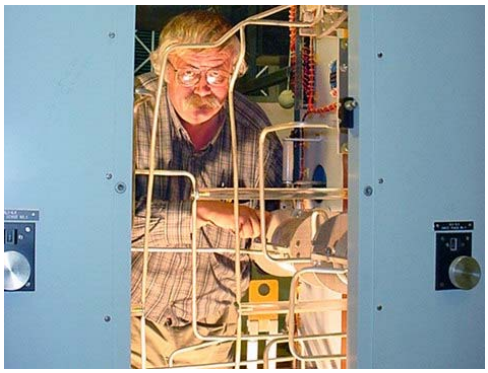
second delay, the time delay relay engages, removing the coil voltage from the contactor coil, dropping it back to the "normally-closed" position, which shorts out the two-ohm resistor, putting full current to the lights. You'll want one set of contactor contacts and one two-ohm resistor for each two-lamp beacon. A two- or three-pole contactor will usually do the trick for a whole tower. We're mounting ours inside the tower light controller, in the same spot which had been vacated by the old voltage boosting autotransformers.

Until next month....

The Portland Report

By
John White, CBRE
Chief Engineer, CBC–Portland

Flash! Oregon makes the funny pages. A "B.C." comic strip making the local media rounds answers the question: What is the best sun block? The answer, folded and packaged in a flat bubble pack, is a map to Oregon.



Taking a page from Jeff Foxworthy, you know you might be an Oregonian if:

- You hear a commercial on the radio about a mysterious yellow orb in the sky that radiates great quantities of heat and light but you don't understand the point.
- You are no longer concerned about the web growing between your toes.
- You are starting a group to lobby to make moss the state plant.

The roof leaks from the communications tower ice fall are repaired, and Oregon winters do lay a foundation for the silly season and the opening of the Oregon state legislature. Oregonians reflexively cover their wallets and the politicians consider laws to prohibit the generation, use or importation of carbon-generated electricity by the end of 2010.

An acquaintance suggested a new spin off TV show for Jeff Foxworthy: *Are You Smarter Than an Oregon Politician?* While there would be hours of comedy material, another pundit observed that you can put a politician in front of a TV camera or radio microphone, but you can't make them stop talking.

Which brings us to the more serious portion of this month's column. As Cris noted last month, economic conditions are tight and Oregon is no exception. With an unemployment above 10%, Oregon is leading the way into recession and likely to be last out.

At the same time, restrictive land use planning has driven the cost of office and studio space to the highest of any station in our company. The last few weeks I have been working through the labyrinth of regulations with the hope of consolidating the KKPZ studios at the Mt. Scott transmitter site.

A little history is in order. The station began in the early 1920s as KALE, and through the WWII years, shared a Sylvan West Hills location with KOIN (the Oregonian newspaper). After the war, KALE began preparation to move to a new location.

In June of 1948, KALE began operation from the new transmitter and studios located at Mt. Scott. At the same time, sister station KPOJ-FM signed on with a listed antenna height of 1,486 feet. KALE(AM) soon became KPOJ(AM) after its owner, *The Portland Oregon Journal* newspaper.

Local radio historians also report early thinking was to explore the new radio with pictures at Mt. Scott. That thinking never matured, and KWJJ, owned by Wilbur J. Jerman, became the first TV station with a flying spot scanner camera tube. Later, KPTV in Portland became the first UHF TV station in the nation.

Then in 1985, disaster struck. The RCA FM transmitter caught fire, causing extensive damage to the building. The building underwent significant reconstruction following the fire.

As a result, KKPZ has a very nice legacy building which is conducive to consolidation of studio and transmitter operations. And so I now am working through that labyrinth of regulations I mentioned.

I am reminded of an early (TRS-80) text-only computer game. In the game you could go up, down, left, right, forward or backward. In each new room the computer described the room. But one day I went into a new room to see the following description: "You are in a labyrinth of rooms that look alike. There is nothing interesting here." So I chose to go back. The computer responded "You are

in a labyrinth of rooms that look alike. There is nothing interesting here."

Land use planning regulations feel a lot like that with Public Space overlays, natural resource overlays. and steep slope overlays. "You are in a labyrinth of overlays that look alike."

Actually, the City of Happy Valley is much better to deal with than the City of Portland. Until recently, Happy Valley City Hall was converted farm house. And the city employees are actually real people.

Stay tuned for updates.

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

March has flown by. I cannot believe its April already! Thankfully, March was a month of little excitement here in Denver. I think the biggest excitement was the snowstorm at the end of the month. Never thought I'd get a snow day at work, but somehow I ended up getting part of a snow day. Something I never got in high school.

One problem that has decided to plague us is at KLVZ daytime site in Brighton. At the end of February, the station went down. I tried everything to get connected to the site to see what was going on, but nothing. I could dial into the remote control, and the RF parameters all looked fine, but there was no program audio or network connectivity. Clearly, the Motorola Canopy STL link was down.

I was able to get the site on ISDN and had to drive out there. I had sent Keith out there to check on this first because he was closer than I was. We had figured the breaker for the Canopy tower was tripped. Keith could not get it to reset. Within seconds of resetting it, it tripped again. So out my dad and I went. After finding nothing wrong inside the transmitter building, we went out to the tower. We traced it down to a problem with the power cable that runs up the tower for the Canopy. Somehow the hot wire had shorted to the tower. My dad, being the brilliant guy he is, reversed the hot and neutral to get us back on the air normally. We knew it was a temporary repair, but figured it would hold until we had to relamp or otherwise send a climber up the tower.

The Canopy worked fine for most of the month, but in the last week in March, I got a phone call that KLVZ was off the air. I noticed I could not gain access through BURK AutoPilot again. I could not get into anything at the site. I figure it was the same problem as before. I sent Keith out again to look at the breaker, but it was fine. Connecting my laptop to the switch at the site, I could not see the Canopy "Access Point" on the tower, indicating that there was no power up there.

We have been running on ISDN for almost a week now. This has proven to be fun because we have to switch the site manually to night mode and back in to day mode using the dial-up remote control. I have become fond of the calendar in my phone reminding me to power down or power up.

On the last Friday in March, the ISDN went all weird on us. It disconnected, taking us off the air, and would not reconnect. Thankfully, Keith was able to get out to the site. The roads were rather unpleasant due to the mini-blizzard we got the day before. He reset the ISD unit, and so far it hasn't gone completely crazy yet. It did get disconnected somehow the following Sunday, but I was able to dial right back in and get it connected.

We are now waiting for some good weather so our tower contractor, GRB Construction, can get out there and hang a new wire. At this point, it looks like it might be another week. I just looked at the forecast and it is supposed to snow every other day. This leaves no time for the ground to dry. Who knows though? GRB may decide to do it anyway.

Ed Dulaney contacted my dad and me after

he had done some frequency measurements on his stations. For whatever reason, he decided to look at Crawford's stations here in Denver and found that KLVZ night site was off by 11 Hz, inside the FCC limit but more that we wanted to see. Dad and I went out and found this to still be true. We tried adjusting the frequency only to make it worse. A very small, specialized tool is required to adjust the frequency on the 10 MHz oscillator module in the Nautel transmitter, and we didn't have one. We tried using the smallest jeweler's screwdriver that we had and broke the trimmer.

I called Nautel and ordered a new part, and they were kind enough to give us the name of the person they buy the special oscillator adjustment tool from. The gentleman I spoke to sent it to me free, except for shipping. Until we received the part, we ran on the B exciter. A week later, the part came in and we installed it and got the frequency adjusted to 810.0000 kHz. This took some doing because it seemed that breathing affected the frequency.

One thing we have been trying to figure out for a few months is the new Importer Plus from Nautel. We cannot get into it remotely as we should be able to. It acts as if it is being blocked by something. I have gone as far as turning off the firewall for the computers being used. Nothing. If we connect the computer to the AM-IBOC exciter, though, it works perfectly. If anyone has any ideas on how to get this working so I can Telnet into the unit remotely, please, let me know.

Thursday the 19th of March, Jay Tyler and Kelly Parker from Wheatstone Corporation came by the Denver offices to demo some new equipment, the Evolution Series. I must say, what I saw was amazing. Denver will most likely not get any of this anytime soon because of how new our equipment is. But I do envy whoever does get this in the future. The equipment I saw gives a whole new meaning to automation. Most automation is automation, nothing real, live about it. But with this new E-series, you can have RCS control the faders and make it sound like there is a board op there working. The system can become even more locked down than it already is. If board op "A" isn't that good at technical stuff and only needs the on/off on the mic, CD and ASERV channels, so be it. It can be set up. If board op "B" is an expert, he can have access to everything. It seems that everything becomes easier. It looks intimidating, but in reality, anybody can figure out this system. That's why it was designed the way it was, to make it easier for people to figure out.

We also saw the E-Square. This is still mind baffling to me. This interfaces with the E-Series or works as a standalone 8x8 module and makes switching so much easier. This can change the way everything is wired up around the studios. It can replace the Sine Systems ACU-1 or BT ADMS44.22 units downstream of the NexGen audio servers, even replacing the audio cards in the audio servers and on-air workstations, connecting with only a Gigabyte Ethernet connection. Amazing!

That pretty much covers it for Denver. The snow is gently falling again outside, making the roads a mess. Hopefully the transmitter sites will behave… otherwise the next time you hear from me may be from the transmitter site where I'm stuck! Until next time, that's all folks!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

Your computer is infected…or is it?

Let's envision this quick scenario. You're sitting at your computer doing some surfing on the Internet. Nothing special, perhaps simply checking out the movie theater listings for the coming weekend. Suddenly, a large window pops up warning you of numerous viruses or Trojans living in your computer. Thankfully, there's a convenient "Remove" button located right on the screen that promises to rid your computer of these nasty bugs. As you move your cursor closer and closer to the button, you can almost hear the collective cries of a thousand IT techs screaming "NO!" What happens next gives me nightmares of the hours and hours of work that will be required to reverse the damage. Although there are several different scenarios that could play out, none of them are good.

Am I being a bit dramatic? Perhaps, but the danger posed by fake virus and spyware warnings is very real and is spreading at an alarming rate.

According to a report released in late 2008, over 30 million people have been fooled into installing fake antivirus software, referred to as rogue. Although the primary mission for some of these applications is to transfer control of your computer to a remote user, that approach is so… well… 2007. Rogue software authors are now able to profit from these applications, utilizing frightening warnings of impending cyber doom to strike at the unsuspecting computer user. A number of these applications masquerade as legitimate anti-virus software prompting you to instantly purchase a license prior to removing the infections. Doing so not only puts your credit card information in jeopardy, but you also end up paying for useless software that has as much virus busting power as the average toaster.

Oh, and did I say these authors can profit from these sales? I meant to say they are able to live lavishly as unsuspecting victims feed their growing bank accounts. Using an average registration price of $68.31, some experts calculate that the more "successful" rogue software authors can make over $13 million per month. That doesn't include the vacations to Tahiti, expensive cars, and anything else they could buy using the credit card number you so graciously provided them.

The number of fake virus warnings has been increasing, so the chance you'll come across one is very good. Some rogue software authors have become so organized that they have established affiliate programs, paying commissions of between 58% and 90% of their sales. One report mentions that

some of these affiliates can earn in the range of $158,000 in only one week, while the software developer enjoys his profits without doing the leg work. As these affiliate chains grow, you can be sure the frequency of fake warnings will do so as well.

I'm sure the big question in your mind is why these developers aren't being stopped by government officials. Believe or not, these guys aren't breaking the law. Although their affiliates may use underhanded hacking tricks to deliver their fake warning messages, the software developer is only providing the software. If selling faulty software were against the law, you would see some very large software studios closing down. I'm sure several names have come to mind, but there's no need to call them out specifically.

Some reports also show that the vast majority of the affiliates are in Russia or operate using Russian servers. They purposely avoid targeting Russian users to ensure they are left alone by Russian law enforcement. I've personally experienced this trend as admin of an online message board. After going several rounds with spam message posters, we changed the registration system to require admin approval of all new members. When a new user registration comes up with a @domain.ru email address or a Russian IP address, nine times out of ten it's a spammer or someone peddling rogue software.

So what should average users do to ensure they don't fall prey to one of these scams? For starters, use common sense when online. Avoid questionable web sites, although I can probably devote several pages to defining questionable, make sure your legitimate anti-virus and anti-spyware software is updated, and be careful when downloading files either through your browser or email.

The most important tip is to never click on a pop-up ad regardless of what it says. I know there are exceptions to that rule, but I prefer to leave it as "never" and let you decide when and where you'd like to make the exception. At one time, clicking the "X" in the upper right corner of a pop-up window would sufficiently close the window and the threat was gone. Those sly developers have now implemented coding that will launch the download or whatever action they desire by clicking on the "X". The safest way is to hit CTRL+ALT+DEL and end the associated task. It may result in your browser closing completely, but that's a small inconvenience in the grand scope of damage that could be inflicted.

Certain rogue applications are even designed to look like popular, legitimate anti-virus software such as ESET, Norton, and McAfee. Some users can see through the subtle differences in alerts and, in most cases, they are subtle. But if you are unsure for any reason, play it safe and shut it down. Closing your browser will typically eliminate the threat unless you have already installed the rogue software. Either way, I typically will run a full virus and spyware scan with my legitimate software to ensure there are no bugs hiding inside the PC. Running the scan manually through the software you are sure you purchased is the safest way to scan for threats. Once installed, many rogue applications need to be removed manually, though a good anti-virus or anti-spyware package will be able to at least quarantine most infections.

Finally, how do you determine if a certain application is legitimate or a rogue? I certainly wish I could list them all here, but the list is growing every day. Some of the more "popular" rogue packages are Antivirus 2009, Windows Antivirus, AntiVirus Lab 2009, and Antivirus XP. If you're still unsure, a great resource that lists most if not all rogue applications in circulation is: http://www.spywarewarrior.com/rogue_anti-spyware.htm. The best advice I can give PC users who are really worried of buying a rogue package while shopping for a legitimate solution is to head down to your local computer store and purchase a boxed software package. You can be sure that rogue software will not be available in retail stores.

So stay vigilant, fellow computer users, and spread the word. Perhaps someday their profits will dwindle to nothing and we won't need to worry about rogue anti-virus software. Although I'm sure I'll be writing about the next new threat and saying, "Rogue anti-virus is so 2009."

…until next month!

KBRT • Avalon - Los Angeles, CA
740 kHz, 10 kW-D, DA
KCBC • Riverbank - San Francisco, CA
770 kHz, 50 kW-D/1 kW-N, DA-1
KJSL • St. Louis, MO
630 kHz, 5 kW-U, DA-2
KKPZ • Portland, OR
1330 kHz, 5 kW-U, DA-1
KLZ • Denver, CO
560 kHz, 5 kW-U, DA-1
KLDC • Brighton - Denver, CO
1220 kHz, 660 W-D/11 W-N, ND
KLTT • Commerce City - Denver, CO
670 kHz, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Denver, CO
810 kHz, 2.2 kW-D/430 W-N, DA-2
KSTL • St. Louis, MO
690 kHz, 1 kW-D/18 W-N, ND
WDCX • Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2
WDCX • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT
WEXL • Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D
WLGZ-FM • Webster - Rochester, NY
102.7 MHz, 6 kW/100m AAT
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT
WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT
WYRB • Genoa - Rockford, IL
106.3 MHz, 6 kW/65m AAT
WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND
WYDE-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT
WXJC • Birmingham, AL
850 kHz, 50 kW-D/1 kW-N, DA-2
WXJC-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

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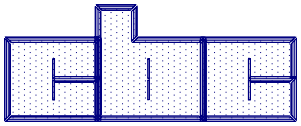

Corporate Engineering

2150 W. 29th Ave., Suite 300

Denver, CO 80211

email address: crisa@crawfordbroadcasting.com