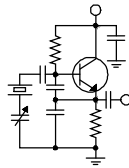


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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The World Above 10 GHz

Each month in QST (amateur radio magazine) there is a column titled, "The World Above 50 MHz." This column is devoted to all things VHF and UHF, and indeed there are a lot of VHF/UHF enthusiasts out there that operate FM, SSB, EME (moon bounce), satellite (OSCAR), packet and other modes on those bands. Of late, I've been spending a lot of time a little bit "north" of the V/U range. I've talked about this in previous issues of *The Local Oscillator*, about the KLZ 11 GHz microwave link that has been up and running solid for several months now.

Last month I had the opportunity to attend a



The rooftop on our studio building is getting crowded. KLDC Canopy BH (L), KLTT 11.395 GHz link (C) and KLZ 11.375 GHz link (R). The KLZV 11.425 GHz link will go on the mast under the KLTT antenna.

Trango Systems factory school in San Diego to learn more about the equipment we are using for these links. I learned quite a bit at that school, and of course it's always good to put faces to the voices and names of the folks I've been dealing with at Trango

for some time now.

I had just returned from that factory school when one of the new links walked in the door in Denver (actually it was delivered on a big truck while I was in San Diego), so I was really well prepared to get the radios configured and ready for installation.

Later in the month, the tower crew came and installed a standoff pipe mount on the 9-inch-diameter mast on top of the building. They returned a few days later and installed the dish for the studio end of the studio-to-KLTT link. I fired up the transmitter at the studio end and everything came up fine.



The transmitter end of the link

A few days later we got the antenna put up on the other end of the link. At first we thought we didn't have a path - the tower crew swept the antenna through its range of azimuth without getting a signal from the studio (which was transmitting). Then one of them noticed that the dish had a considerable down-tilt. They used a torpedo level to set it plumb as a starting point, then tried the sweep again. This time they got a signal and were able to

adjust in both dimensions for maximum. We later did the same thing at the studio and got the expected receive signal in both directions.

At this point, I'm letting the link run for a little while to make sure it's solid. At some point early this month I will swap out the multiplexer cards in the Intraplex and start using the new 11 GHz path for the station's STL.

No change in the operating parameters was observed with the installation of this dish, which doesn't surprise me. It is not much wider than the face of the tower itself and it is shallow front to rear, so it doesn't stick out much from the tower face. The 5.7 GHz dish it replaces actually protrudes more, even though it is smaller.

One thing we are paying particular attention to at the studio end is lightning protection. This building and its twin next door are the tallest structures for a couple of miles around and not surprisingly, they do attract some lightning. We sailed through the summer with the one Trango link, a Canopy link to KLDC and a "disk cone" receiving antenna, but the new KLTT and KLVZ microwave antennas are/will be mounted on the mast, so there may be more challenges.

I haven't yet been able to ascertain how or even whether that mast is "grounded." It appears to bolt into the structural steel of the building, but I don't see any ground wires connected to it. Perhaps it doesn't really matter — after all, up on a 160-foot



An array of PolyPhaser "Transector" Ethernet surge suppressors is mounted on channel beneath the microwave antennas. Note the green bus wire that grounds the frame, the masts and all the Transectors.

rooftop, what is "ground," anyway?

There is a ground bus up on the roof that T-

Mobile has their platform and equipment tied into, and I had our electricians run a heavy (1/0) cable from the center of their "star" to our mounting frame. The frame, on which one of the Trangos, the Canopy and the disk cone are mounted, is grounded to this bus and I have a PolyPhaser Transector Ethernet surge suppressor up there and grounded to this bus for every Ethernet cable coming from our engineering room. I also installed a ferrite core on each cable, winding several turns onto a core for each Ethernet and snapping a split ferrite "bullet" on each piece of coaxial cable.

One other thing that we have to pay attention to in this part of the country is UV radiation. Here in Colorado, the sun is just a couple of thousand feet away (or so it seems!) and we get a full dose of UV rays with so little atmosphere above to filter them out. Just about anything left outside without UV protection turns to powder in a short time (or turns bright red if we're talking about unprotected skin!). That means that the CAT5 cable we use in exposed outdoor locations has to be jacketed with a UV-rated material. Such cable isn't cheap, and it's tough to install connectors on as well. Even the cable ties we use up on the roof have to be UV-rated or they'll crumble in just a few months.

We still have one link to go in Denver, the one from the studio to the KLVZ daytime site north of Brighton, Colorado. The tower crew has already built the mast mount for the studio end and is working on replacing the guy wires on the tower at the transmitter site (a structural analysis we ran showed that we had to increase the size of the top level of guy wires). Hopefully we'll get this link done this month and be able to call the big CBC-Denver relocation project done!

But wait, there's more!

Denver isn't the only place we're thinking about using 11 GHz fixed microwave links. In Detroit, we've been struggling for a long time with a crumbling telco infrastructure in the area around our studios and offices. With no resolution in sight (other than just moving circuits and lines from pair to pair as problems continually crop up) we began looking for alternatives.

Trango makes a product called the "GigaPlus" that will transport eight T1 circuits over an 11 GHz link. That seems tailor made for our situation. We can have our PRI circuits (T1s that provide 24-line trunks to our studios and offices) terminated at the Motower facility, the site of the 1,000-foot tower that WRDT uses for its nighttime radiator and shares with several FM and TV stations,

located about six miles from the CBC-Detroit studio site, and we can transport them to our studios from there on the GigaPlus.

At this point we have our PCN (frequency coordination) done, the FCC application is filed and we have a draft lease addendum from the tower owner. We're waiting on both FCC license grant and pricing from our telco before we move forward.

Conductivity Measurements

The KBRT mainland transmitter site development project continues, albeit at a snail's pace. Sometimes I can't believe all the stuff that California comes up with in the way of regulations, procedures and requirements. Even though we are only impacting just a few hundred square feet of the 35-acre site, they seem to be treating the project as if we were building some sort of manufacturing facility up there.

Get this one official said that we may have to install a detention pond at the base of each tower to catch and hold rainwater runoff because when it rains, manufacturing oils from the towers will wash down the towers and get into the groundwater. *Are you kidding me???* I guess not. And so it is that we have had to commission a study to develop a Water Quality Management Plan.

Over on the more sane and predictable FCC side of things (have you ever heard those adjectives applied to a Federal agency before?), the allocation study is almost complete, lacking only one radial of conductivity measurements from the site. Thankfully, there is a good bit of data already available from the days when the site was used by the 830 station, but there is that one small arc of coverage that wasn't measured, and it is one that is in the direction of third-adjacent channel KSPN (710 kHz, 50 kW), for which there is a 25 mV prohibited overlap. The FCC's M3 conductivity map shows values considerably higher than has been measured at the site, so we know that we will measure lower values on the 275-degree radial as well. Once we wrap that

up we can finish the allocation study, put the finishing touches on the directional pattern and get the FCC application on file.

Measuring ground conductivity is easy to just fire up your transmitter and make field strength measurements out the radial in question. The problem here is no transmitter and no antenna! So we'll have to put up something temporary just for this purpose.

We have an STA from the FCC to test with 1 kW on 1690 kHz until the end of October. The current plan is to put up an 80-foot mast, set it on some sort of insulator (Bill Agresta, a.k.a. Black Star Bill, has some surplus pole insulators that might work, or we could simply stack up some ceramic floor tiles), spool out a dozen or so radials for a ground system, cobble together a matching network and drive it with a generator-powered 1 kW solid-state transmitter. We're working on all the details now and should have it all ready to go by the 20th of the month.

It will be just like Field Day in ham radio - go out to a remote location, erect a temporary mast guyed with nylon rope and start transmitting! I especially look forward to tromping through the snake-infested brush up on that mountain for the close-in measurements.

We'll be sure to get plenty of photos and share them next month.

Goodbye – Sort Of

I'm saddened to report to you that Rick Sewell, long-time chief engineer of CBC-St. Louis, has accepted a position on the engineering staff of Clear Channel's cluster in that market.

The good news is that Rick is staying aboard at KJSL/KSTL as contract engineer. So even though he won't be full-time anymore, we will still have him around and enjoy his talents and expertise. We wish Rick the very best in his new full-time and part-time endeavors.

The New York Minutes

By

Brian Cunningham, CBRE
Chief Engineer, CBC – Western New York

Hello to all from Western New York! I can hardly believe how fast the summer has gone by this year. It seems like only weeks ago I was planning all of the outdoor projects I wanted to get completed this year, and now I am looking at getting everything prepared for the long winter, which is just around the corner.

Our biggest project this year was to finally get the 6-tower array painted at WDCX(AM) in Rochester. We have been trying to get these painted for the past two summers, but rainy and cloudy weather did not permit us to even begin this project until this year. Don Boye of Western Antenna & Tower Service did a wonderful job painting and inspecting the 275-foot Rohn towers, and aside from the bullet holes in the leg of tower #2, he found the towers to be in relatively good condition. We did find while painting the last tower that the 1/2-inch copper tubing that connects the output network to the tower (#3) was holding on by less than 1/16 of an inch. Apparently, wind had caused the tubing to flex side to side, resulting in splitting of the tube where it was flattened to attach to the tower. Instead of making a repair, we replaced the entire 1/2-inch copper tube, brazed it to the tower, and added a couple of lock wraps so it would not be able to flex at the flattened portion again. While each tower was being painted, I was busy inspecting each network, marking where each pressure clip was attached to the coils and insuring that each electrical connection was tight, and that all of the RF switches were lubricated and switching properly. It takes a lot of work to keep a 6-tower array functioning properly, but if regular maintenance and inspections are performed you have a much better chance of catching a problem before it knocks you off the air.

WDCX-FM Buffalo

This past month has been relatively quiet at our Buffalo facility, with nothing much to report on. In October, we will be replacing our STL tower,

which is located on the roof of the studio building in downtown Buffalo. The old tower has been in place for as long as we have been there ó, my best guess is that it is at least 30 years old ó and it was hand-built using angle iron, 2x12s and some 2-inch round pipe. The entire structure was guyed off with standard TV mast guy wire which had rusted and broken off some time ago. It was only a matter of time before the Buffalo winds off of Lake Erie caused the tower to fall over, shutting down both our STL and TSL paths between the studio and transmitter site in Boston, New York.



I will be replacing the old tower with an aluminum tower that is relatively lightweight and has a non-penetrating roof

mount. The hardest part of this project will be in hoisting up the side of the building all the parts to assemble the tower. Access to the roof is via a 2ø x 3ø trap door, which is too small to be able to bring everything up to the rooftop. Once everything is up there, we have the luxury (and enough roof space) to fully assemble the tower and move it to the proper location. We can then simply remove the two Scala antennas from the old tower and relocate them to the new tower. I figured a couple of days to get the tower fully assembled and into place, and it should only take Don a few hours to remove and reinstall the STL dishes and FM receive antenna onto the new structure. I would like to also include an AM loop antenna on the top of the tower to be able to receive WDCX(AM) in Rochester during the daytime operation hours. If any of you have a used loop antenna that you are not using, and could spare it please let me know.

Server Replacements

Soon we will be replacing the NexGen file servers in both Buffalo and Rochester with new Dell servers. We have been fortunate that our current file servers have been working non-stop with no problems for the past six years, aside from the usual

drive-space problems. Stephen Poole has specked out our new servers, and hopefully everything will copy over with no issues. We will be using Ghost to copy our current OS and inventory from the old server to the new one. Past experience with Ghost has shown it to be the fastest and easiest way to get this accomplished. The bonus is that we will have a spare server in both locations should a complete failure of either file server occurs. You simply cannot have enough redundancy!

What's a Picture Worth?

Each couple of years, I take digital

photographs of the studio and transmitter locations and keep these filed away for insurance purposes. In the event of a catastrophe, having photos of your equipment, buildings, grounds etc. to present to your insurance company in the event you need to file a claim, can be priceless. Not only that, you should send them to your DOE so he can see what a wonderful job you do in keeping your sites clean and orderly!

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

Joseph M. Huk, Jr.,

P.E., CPBE, CBNT

Chief Engineer, CBC-Detroit

WRDT Monroe Feed Though

During one of my inspections of our WRDT Monroe facility, I noticed a cracked glass bowl insulator at the tower 2 ATU building. After consulting with Cris, we looked at Kintronics Labs (KTL) for a suitable, up-to-date, replacement.

KTL suggested a 7-inch ceramic bowl kit as a replacement unit. I received the unit in a couple of days and planed to install it on Friday of that week. About a month ago I purchased some barn paint so that I could freshen up the tuning houses when time permitted. Since I was going to do this repair and the weather was good, it looked like a prime opportunity. I removed the old glass bowl insulator and bracket and then planned how the new ceramic bowl was going to be installed. I looked though the box and found no drawing or instructions, so I drove back to the transmitter building and called KTL for a good mechanical drawing.

After receiving the drawing I placed all the necessary hardware in the correct places. I noticed that the kit did not come with a corona arrester, so I

reused the old one so that we would retain that protection. After completing the hardware installation, I applied a bead of silicone sealant to the

edge of the wood support and the outer lip of the bowl bracket. This should provide added protection in keeping out mice, insects, and the elements.

Once I completed the repair, there was still sufficient time to paint the building. Since I had only one gallon of paint, I took the attitude that I should address all of the worst sides of the building first in case I didn't have enough material for the day. I started with the side that contained the new insulator and worked my way around the building, and I was able to cover all

the bad sides. So it looks like it takes 1.5 gallons to complete a building. This is good to know for the future. My intent, going forward, is to try to provide this maintenance, as time and weather permits, at the remainder of the tuning houses.



Transmitter Site Security

Since our transmitter sites are unattended, there is a need to have visual monitoring of the facilities. I had a meeting with our IT director, Larry



Foltran, to discuss what would be good candidates for our needs. The WRDT(AM) transmitter site is on 20 acres of land. We have four tuning houses and a transmitter building. Since copper theft and senseless property damage is still plaguing stations, visual security is a must.

This month I have been looking at the TRENDnet TV-IP 110 camera. Since it has a built-

in web server, it does not require a computer to operate. A computer is only required if you wish to store the pictures that the camera takes. Video can be live or snap shots. The camera has motion detection and can email the photos to you when motion is detected. I have set up a FileZilla FTP server as an interface to access the stored pictures.

The software that TRENDnet packages with the camera allows you to set up the directory paths for stored pictures and the email address where you want the pictures sent. There is also a sensitivity adjustment to allow the user to set the motion threshold for a picture to be taken. It has very good low light sensitivity. However, at night, it would not be suitable for outside use near the tower. Night vision or infrared will be needed for that application. This camera would work well in the building. There is also a wireless WiFi version of this camera for areas where cabling is not possible.

Next month I hope to evaluate a night vision camera that would work in a no light condition application.

Until next time, be safe, and if all goes well, we will be reporting to you from the pages of *The Local Oscillator* next month.

News From The South

By

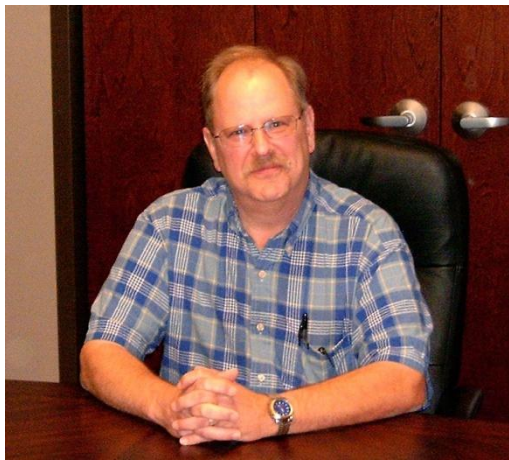
Stephen Poole, CBRE, CBNT, AMD
Chief Engineer, CBC–Alabama

Tarrant Must Have Become Lonely Again ...

The 50,000 watt, 5-tower array at Tarrant, Alabama, decided that it was lonely in mid-September. Bob Ratchford, who keeps a close (some would say, õgimletõ) eye on WXJC, noted that he was unable to raise the power to 50 kW and told me that something was wrong. We headed out there to take a look and sure enough, as soon as Jimmy opened the ATU at tower #1, that familiar, acrid smell of burnt capacitor greeted us. My protection circuit had forced us to low power to prevent further damage.

We have lost that same capacitor several times over the past few years.

This time, it appeared to have slowly overheated, leading me to suspect that something might have been mistuned. We got the station back to a legal power (if a bit low), confirmed that the monitor points were in limits, and then I started working on a permanent solution.



At this point, Iõl toss in a plug, not just for our folks, but for those of you who might work for someone else. If you havenõt tried Cris Alexanderõs modeling software, you donõt know what youõre missing. In my never-humble opinion, three programs in the Au Contraire kit are essential for any engineer who maintains an

AM directional station: DADesign, ACModel, and

ATU Design. Don't think that you'll only use them when building a new array! If you're having problems, you can use this software to "what if?" and plug in different scenarios until you see something that makes you say, "ah HA!"

I have worked with AM directional stations for many years; in fact, the first full time job I had as a radio engineer back in NC was looking after a 100,000 watt FM and a brand-new, just-built 5 kW AM array. But none of the others that I've maintained over the years have been as temperamental as this one, probably because none of them had such tall towers (109 degrees), or in particular, had one tower with such a low ratio.

At WXJC, the bulk of the power goes to tower #5 (about 32 kW), then #3 (about 11 kW), then #4 (5.5 kW); the remaining bit goes to tower #1 about 1.5 kW. Using the modeling software, some very interesting facts came to light:

1. Tower #1 has very little effect on the rest of the array. That isn't surprising; it is the lowest-powered, after all. In fact, it's only there to "nudge" the pattern a bit more toward Birmingham, and to slightly shape the null toward a protected station. But even with tower #1 floating, the antenna monitor parameters for the other towers only change by a few percent.

2. Conversely (and also not surprisingly), a change at any of the other towers will have an immediate and usually dramatic effect on #1. This is the very reason why my protection circuit watches the ratio on that particular tower.

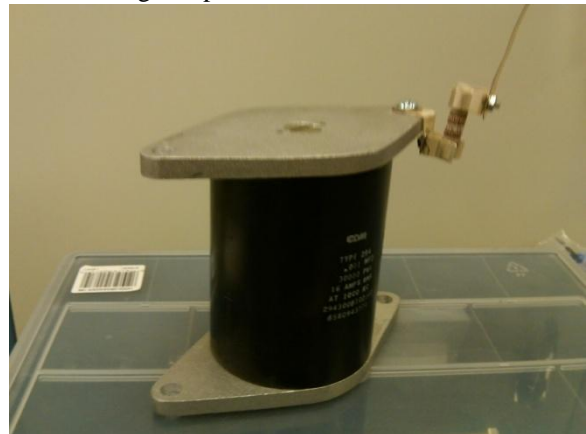
3. The biggest clue was that the tower impedances were also pretty stable with ratio changes ... except for tower #1.

Let me elucidate on that last one. One field engineer's rule of thumb is that as long as the ratios are in the ballpark and the phases are close, you can get decent "starting point" figures for your tower driving point impedances (DPIs). You can use any good ATU program to calculate the component values, set all of the ATUs to those preliminary figures with a bridge and then fine-tune and adjust as needed to make it happy. Tower #1 is a notable exception and the modeling software bears this out: the DPI for tower #1 changes by 2:1 with only a 10% change in the ratio! This makes it extremely difficult to tune; everything and anything elsewhere in that array will dramatically affect it. It also makes it more susceptible to damage.

Therefore, after replacing the capacitor

again, we went back and carefully (carefully!) adjusted everything in that ATU for the best possible match. Everything in the ATU is nice and cool to the touch. We're keeping an eye on it, but I feel pretty good about it now. A little knowledge goes a long way!

And just in case, we've added one other refinement. We had already added a fuse at the phasor output for tower #1; we've added another fuse in series with the capacitor that keeps cooking. If that fuse blows, we'll know that it's time to take another look. Never give up!



A Fuse To Protect The Capacitor!

Air Conditioners Ain't What They Used To Be

This is the "I Sound like an Old Man" segment. Years ago, my grandmother leased rooms on the top floor of her home in NC. Each bedroom had a Hotpoint window air conditioner that just worked, year after year. I don't remember those things ever being serviced. They were inefficient; they may have harmed the environment; they were big and ugly and bulky, but those monsters just belched out cold air, one season after another. We only removed them after dear granny passed away, we moved into the house and installed a central air unit. They were still working when we pulled them out of the windows.

Likewise, the local grocer had a huge air conditioner behind his store that was loud as a bomb, big as a truck and probably as efficient as a gerbil on a treadmill, but it just worked. Year after year, you could walk into his store and actually catch a chill, regardless of how hot it was outside. I don't remember that thing ever failing.

Is it just me, or are the air conditioners that are being installed nowadays nothing but junk? I've asked some of the HVAC technicians who've come

to service our units, and they've admitted to me privately that most of them are built in Asia now, from the top name brands to the unknowns, and are all about the same quality (i.e., ranging from barely adequate to poor). To increase efficiency, they run at much higher pressures and the motors are smaller to start with. It all adds up to units that fail more often, and more spectacularly.

When you add in the fact that they don't cool as well (also confirmed by the technicians with whom I've spoken), it's annoying. They may use less electricity, but they take much longer to cool a room. Those old Hotpoints would run you out of the house within a few minutes of being switched on. Nowadays, it seems like an air conditioner has to run for an hour or more before you really start feeling comfortable.

What this means, realistically, is that when we spec a new air conditioner nowadays, we probably ought to insist on at least 10 years of warranty. Otherwise, you're going to get hosed. Also, I wonder if the argument could be made that paying 50% more for a unit that's 10% more efficient will actually pay off in the long run? Not if it has to be replaced in five years! Go for 10 years, minimum, and even then, weigh the long-term savings against the up front purchase price.

I'm going to hand off to Todd now; he's going to talk about backup and recovery. I leave you this frightening image: apparently, we have to mark the trucks in Alabama to keep people from eating them now. Until next time!



DO NOT EAT!

Back Up That Data! – Todd Dixon, Assistant Engineer

As hard drives and storage solutions have crept their way into the level of the terabyte (and

greater) capacity, it behooves all of us to become more familiar with ways that we can back up our most precious data, whether it is work related or of a personal nature. Routine backups can alleviate a lot of problems for you and save you a ton of work in rebuilding your system.

There are a number of pretty slick software programs that can help you backup your computer. Most of them would have you pay for the security of having your critical information backed up. One way to secure your files is to use an online backup service like Carbonite (<http://www.carbonite.com>). Basically, you buy a plan for 1, 2, or 3 years that allows you unlimited backup of your files for about \$5 a month. There are others as well, but they all work off the same principle. Your initial upload to them is a truckload of information. After that transfer, your computer and their servers sync with each other on a regular basis. If your computer has a file that their server hasn't seen yet, the file will get uploaded to their server. The advantage of systems like these is that someone a lot smarter than you or me is managing a whole cluster of computers and their primary responsibility is preservation of files. Of course, one of the obvious drawbacks, while I believe services like these are ultra secure, your backup is out there and you cannot put your hands on it without an Internet connection.

Another way to handle your file storage is to use the power of a network. Most of us have those little magic boxes somewhere in the house that squirt the Internet to all of our computers wirelessly (or if you're old school, through an Ethernet cable). Why not add a computer from days gone by to your network that does nothing but house your backups? Microsoft has attempted to capitalize on this market with Windows Home Server (WHS) software. By placing a computer with WHS on it on your network, you are in business. Each computer on the network becomes a client to that main server and can place backups on it. It also becomes a central repository for media and possibly a printer server as well so that everyone benefits from the power of your network. NAS (Network Attached Storage) units have also become popular and serve nearly the same function as a WHS or any other server solution. They are generally smaller than a computer with WHS on it and are hardware driven, not software driven. NAS boxes are typically more expensive. Both solutions take about the same amount of time to tweak and are solid backup solutions. The immediate advantage is that your stuff is right there with you. The negative is that you have just added another computer to maintain to your network and that you spent some

money for WHS, NAS or whatever hardware you may have needed to handle your backups.

External USB hard drives have become extremely popular and have fallen like rocks in price. The above referenced terabyte hard drives can be gotten all over the internet for under \$75. You can spend a little more and get an external drive with the manufacturer's own software backup solution. This is certainly the easiest backup solution of all to maintain. Simply plug up your external USB drive to your computer and you are ready to backup your data.

Most of you who frequent the pages of *The Local Oscillator* know that if I am writing in it, it is most likely because I have found a new program to introduce to you and that trend isn't stopping here. This entry is a Linux distribution whose only function is to do what its name states Redo - Backup and Recovery. It is about a 75 MB ISO download (you'll need a program like ImgBurn

(www.imgburn.com) to convert the ISO to a live, bootable CD. Plug your external USB drive into your computer, place the CD in its tray, and when the CD boots, you are immediately given the option to backup or restore your files to a specific location. This isn't a "pick and choose" the files option, it is an "I'm about to backup your entire drive" option. So you lose your hard drive in the computer, go get a new one, boot Redo with your external USB drive, and hit the restore button - you're back in business. Want to give away a computer but make sure the hard drive is clean? Redo has an option for that too. It is dead simple and doesn't cost you anything but the cost of an external hard drive.

I hope this helps you before it is too late. We all work in a business where we plan for hardware failure with redundant systems. Make it easy on yourself and find some time to backup your important data before you lose information that you simply cannot replace.

Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! It's already fall and yet summer has just now arrived here in Southern California, breaking the all time record for high temperatures! It's been a strange summer, though, most of it not getting above 80-degrees, although we did have a small heat wave here and there. This most recent weather, however, has been unlike anything I have ever experienced here, not only the record breaking temperatures but the strange monsoon-like clouds and gusts that seem to come out of nowhere and then disappear. One day in late September Los Angeles hit 113 degrees downtown while here at the KBRT Ranch we experienced 108 degrees, something we have never seen before. As for myself, I love this weather - hot is great as long as the humidity does not get out of hand. If the temperatures get too hot up here where I am, I can always go into town to run errands where it is about 10-degrees cooler down on the water front. Of course then I get



to deal with Avalon, a very strange and sleepy place. Although the weather was not an issue for me, I continue to face the ongoing "island factor" here that only seems to be growing worse with each day that passes. Dealing with our electrical power, phones and Internet has become a very frustrating day-to-day struggle for me, never knowing what to expect with each passing hour. Though by God's grace we have managed to maintain our air presence without interruption, everything surrounding those infrastructure components that keep us on air seem to fail continuously.

Though our KBRT listeners on the mainland continue to listen without any idea about the "island factor," being here and dealing with it almost daily can become extremely frustrating. Living on an island without many of the resources most of you take for granted, I tend to rely on the Internet a lot for

purchasing food, toiletries and the like. I also use the Internet for intercompany communications, but ever so often I might spend over an hour trying to accomplish something that most would do in a few minutes without a second thought.

Many times people trying to call me here at the transmitter site get a recording that our phones have been disconnected and there is no new number. This becomes an issue for us as I wonder why I did not get a returned call from a certain entity only to find out they tried to call but were under the impression that our phones were disconnected. Try working on a malfunctioning piece of broadcast equipment with tech-support and the phones become intermittent! You get the answering service who gives the tech your number, but on the callback he gets the recording that your phones are disconnected and goes back to bed. After going round and round with this a few times, the tech is not so nice to talk to! Even Cris Alexander got this message a couple weeks ago while trying to call me on our main number and after trying several of our other numbers only to get the same recording, he tried to email me not knowing our Internet was down as well. Finally, wondering why I had not heard from him, I called him and got the story. So, I guess you can understand how this can become very time consuming and frustrating, but with all our efforts to resolve our list of island factor issues here, they only seem to get

worse with time.

With all the frustrations on the island, it's nice to see progress at our new site on the mainland. As we move through the usual red-tape as well as the added load to make the State of California happy, things are progressing and we will be doing our first testing at the site towards the end of this month. Though I have a few things to do to pull this together, this is a breath of fresh air for me and will do me good.

While most radio broadcast sites have their issues these days, whether it is vandalism, theft or other fun stuff, the issues we see that will need dealing with at this new site are so much more "normal" than most we face here in the island. These more "normal" issues usually have known and proven solutions available, and being on the mainland, most of our logistical issues will become a thing of the past. Though I know that I will miss many aspects of this beautiful island, I very much look forward to the move.

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

Project Scheherazade

Last month's question was, "What is pattern bandwidth?" This has to do with an AM station's ability to be broad-banded in the nulls of its directional pattern; that is, not just in the carrier but equally attenuated in both sidebands as well. The ideal in this case, seldom achieved, is to have *all* of the RF energy in the null direction diminish together, from one side of the channel to the other. But, as we all know too well, it just doesn't always happen that way.

Just about all of us who have engineered a

directional AM station have experienced this. You go off to do a monitor point check in the null and you find that the job is almost impossible to do properly because the carrier has disappeared in the null, but the sideband energy is really hot. Amateur Radio Operators will liken it to a single- or double-sideband signal without the local oscillator turned on to re-insert the carrier. Fortunately in most cases, this problem, and it is a problem, particularly when HD on AM is involved, is sometimes solvable with a re-design of the phasor and/or ATU parts of the array. Rarely is the situation such that more than that needs to be done, but there



are a few arrays which are not amenable to any solutions.

I have in mind a station in Western Michigan on which I did a recent DA proof. I am told that the station's pattern bandwidth had greatly improved from what it had been in the past, when the problem of narrow pattern bandwidth was really severe, but if that's the case, I found myself thinking that this particular array, designed and built in the early *forties*, probably could use a complete do-over. Which the station is planning... for other reasons, to be sure, but that station's pattern bandwidth would still likely be solved only with such a radical change. Face it: They don't make DAs like they use to, and that is a good thing.

Another station, right here in Chicago, had to drop all three of its towers due to serious structural issues a few years back, so what the heck, why not change the tower line from an in-line to a dog leg as well, to null only in one direction instead of the two directions that they had been protecting for sixty years? The second null was simply not needed but was there because of the pattern symmetry produced by the in-line array. In fact, another station, up north, had camped there for decades but had then moved onto another frequency, so the second null could now be filled in.

Well, the new DA was put together, but a problem with the pattern bandwidth was immediately discovered, not just in the big null but at several other places in the back of the pattern. It took the consultant a bunch of months to fix the problem, but finally the pattern is pretty well listenable in all directions and the station is now operating in HD full-time.

Now, here's next month's question, and it's in the form of a story and not really a radio question, either: As I mention below, I got a call from the Director of Communications at IDOT (Illinois Dept. of Transportation), and one of the things he told me was that the his cameras on the new tower at the state line were looking at our tower and they noticed that the daytime strobe tower lights were only working intermittently. They observed that the strobes would work for awhile and then stop for awhile. Mack and I checked out the situation visually, on the scene, and found that the tower lights were running just fine, thank you. The question is: what was going on here? Why the discrepancy between what the IDOT DOC saw, and what we saw? I told this story to my friend Len Watson, and it took him a couple of minutes to figure it out. See if you can figure it out any faster.

Management Course on Dealing with Chief Engineers

I wonder where Dr. Dean Bennett is and if he is well. Dr. Bennett was both a fellow student and one of my instructors at Michigan State University back in the late 60s and early 70s, working on his doctorate in Radio and Television Arts and Sciences while I was working on both my BA and MA in the same discipline. Dean Bennett was a gentle man, very knowledgeable about the business, and had been both in management and on the air in Salt Lake City and Seattle, working for Bonneville Broadcasting, which as most know is owned by the LDS (Mormon) church of which he's also a member. He was looking to get his Doctorate so that he could join the faculty at one of the big universities in Arizona. I learned a lot at his feet and he even got me my first paying gig in the business as the part-time vacation fill-in transmitter engineer at the local radio station where he was the morning man. That was in December of 1968. I've been continuously employed in the business ever since.

I made it a point to enroll in every class in which Dean Bennett was the instructor. That included his station management class, the sales class of the first of its kind broadcast sales class taught within a college setting, and his Broadcasting and the Public class. It was in his management class, however, that I absorbed the greatest amount of knowledge, because I felt that he was aiming his course straight at me. In my entire career I never actually became a station manager, one of the few positions I haven't held, but Dean Bennett's management class taught me as much how to see through a manager's eyes as anything else, and that has been the one thing which has helped me most in my career. The only managers with whom I never got along, and there were just two of them, were true charlatans in the field, and the urge to move on to better things comes from having had to work with them. That's lesson number one: Blessed be the bad or evil manager, because he is the means by which great blessings will come when you move on.

There is a point here. This newsletter is read by more than 5,000 folks in the broadcast business, because this is the only such newsletter in existence in the industry to the best of my knowledge. I'd bet that this great number of our readers includes a lot of management types who just want to know about what engineers really deal with. I say that the fact that they read this rag is to their credit, and for that reason. You engineers in the crowd can skip to the next article. It is for the station managers that I am writing this one.

One of Dean Bennett's lasting lessons for me was this: When it comes to engineering, it is the feeling of most members of management that engineers are the other side of sales. Sales creates the wealth for the station, engineering dissipates it. That is the prevailing management wisdom, and that wisdom is truly folly. First, a good engineer is worth pretty much whatever you can afford to pay him, because he (or she) is the one who makes sure that the station has the product for your sales department to sell in the first place. Second, proper engineering management, especially now in the digital age, can make the engineer a key player in the station's ability to make money. Good engineers have, and get, ideas about ways to increase the station bottom line all the time. Heck, we engineers have done it here in Chicago several times over. Hire an engineer who's really into making the other departments work and produce better, then listen to him or her and you'll find out how valuable an engineer can really be.

Second, finding a good engineer to hire is the hardest part of being a manager of engineers (now, this is Dean Bennett speaking, over forty years ago!). Comparatively speaking, hiring sales people is a piece of cake because the typical manager probably rose through the ranks of a station in the sales department. On the other hand, most station managers have not had much in the way of technical training or skill, so they have to have their eyes opened up in other ways to get things done.

The station manager has to keep an open mind as to his skills, because there are several things beyond technical skills to look for in an engineering prospect. How well does the candidate communicate? Is he at least a decent writer? Yes, this is important, because having a good communicator for an engineer is the only way in which his or her skills can be comprehended by the rest of the staff. Dr. John Gibson, long the Dean of engineering at Oakland University in Michigan, and another one of my best instructors, communicated it to those of us who were blessed enough to be students in his Basic engineering course. He said, most succinctly "There is no such thing as a good, *illiterate* engineer." Indeed. My own father, a well-educated engineer in his own right, agreed wholeheartedly. The good engineer is not afraid to communicate, and can do it very competently. An essay test as part of the hiring process may not be such a bad idea.

How open is the candidate to both observe and talk about problems? Show the candidate around the station (or get his predecessor to do it, if you can; better yet, both of you do it). Inasmuch as possible,

find out from him or her what they might do to improve the station based on what they've seen. Remember, the mandate of the engineer is three-fold: Keep the station legal, keep it on the air no matter what (during scheduled operating hours), and keep the station sounding good. In that order. The worthy engineer will use those three mantras to formulate a plan for station improvement. Once hired, the two of you can work on both time line and budget.

Now, understand that good communication skills doesn't necessarily mean glib. My experience indicates that the worst engineers out there have a tendency to be shameless self-promoters, or to know less than they want to you think they know about their skills and their ability to do their job. You show me an engineer who boasts or who has that air of superiority around folks and nine times out of ten, I'll show you a lousy engineer.

Another thing to check I didn't use to think this way, but now I have to add it: A sure sign of a serious broadcast engineer is his membership in the SBE, and not only *if* he or she is certified, but in how many specialties. Ask the candidate whether he or she has taken a course at SBE University. As time goes on, more and more engineers will be taking their technical training on line, either with SBEU or some other institute. An engineer who's into keeping up with the times is not rare, but if you find one that's available, then that's the one to hire.

Now, the issue of contract vs. a share-time vs. a full-time engineer: That's a tough one, but there are ways to gauge what you need. How many stations are in the cluster? If it's more than three, and especially if one is a directional AM, a full time engineer is the only way to keep up with the problems which will inevitably arise. The cost of a contract engineer has to be compared to keeping a full-time person on board. As a contract engineer I've had to advise a couple of clients that they'd better look for a full-timer, because at the hourly rates the contractor's charge, there comes a point where hiring a full-timer (or maybe an engineer who doubles in production, or on-air, or even sales) may be much more cost effective. You really have to sit down and do the math to find out where your break point is between contract and full-time cost. While the salary requirements of a full-time CE or CE combination varies a lot depending on market, figure on a minimum of \$40,000 a year outside of the major markets, just to start. Within the major markets, the salaries approach \$80-100,000 a year. Armed with that information, you have some idea of what a good engineer will cost.

Now, how about hiring someone who comes

from outside the discipline? I've seen them hired from the local TV repair shop (bad idea), from industry (usually in electronics design (they don't have the broadcast corporate culture quite down, but they're trainable if you have the patience), and the biggest area of all, from the ranks of Information Technology (IT). This last is truly a mixed blessing. To be sure, if you have a lot of data stuff going on, like a very complex automation system, with PSD data, a VPN for your sales department and the usual Internet/network-based office system, an IT guy, any IT guy or gal, looks really good. But, unless that IT person is also an audiophile on the side and/or is very interested and effective in dealing with RF issues, this could be a very bad deal.

One broadcaster I've dealt with lately had an arrangement like this: He had an IT guy who was doubling in studio maintenance, and doing an average job at the latter, but his RF knowledge was enough to leave you cold. So, he contracted out his RF maintenance. The contract guy was really good, but he was rather restricted in his hours working for the station and he couldn't always be there to do the proper PM. And when he did get in to work there, he inevitably found something wrong. This scenario as a whole may not be a bad thing, don't get me wrong, but by the time this particular station got the parts and repairs that it needed, it had been operating with one of its patterns at serious variance for a couple of weeks, to the point where the station had to operate at night with the day pattern, at reduced power. If the RF guy had been the CE, or just full-time, he would have found the problem sooner and the problem wouldn't have cost the station nearly as much as it did. What if the problem was in the day pattern and the station had to operate at its restricted night pattern and power during the day for a couple of weeks? Right there's a great argument for have a real broadcast engineer on the full-time staff. The engineer saves the money as well as spends it. Don't forget that.

One more thing: If a station is well-maintained, the budget for repair and maintenance of the station varies very little from year to year, adjusted for inflation. Proper construction and maintenance of a facility really does reduce both down time and, in many cases, the costs of maintenance. That is best accomplished with a full-time engineer on staff, or with a contract engineer with a healthy number of hours at your station a month.

If you have anything else to add to the discussion, or questions, you can contact me at areis@crawfordbroadcasting.com. As most folks who

know me already know, I'm not shy about answering... or listening.

Copper Theft Revisited

I got a call recently from an old friend of mine who is a cell site technician for AT&T Wireless. Seems that copper thieves are getting active around this area again, at least at cell sites (we've seen nothing on the broadcast side lately). They're now getting bold enough to climb up to near the tops of towers (with or without a belt, I wonder?) and drop whole lengths of coax from the antenna bases to the ground, then abscond with all of it, leaving the affected cell site dead. They're also stealing the copper bus bars which form the most important part of the ground system, and you know what that means.

My friend tells me that his boss has found a vendor who will sell copper parts such as that, each customized for the customer and stamped or engraved with the words "Stolen from..." and the name of the account. This should alert scrap yards that the copper they're being told to buy is not legitimate. It's about time. I've been trying to get the information about the source from this guy since. Soon as I get it, I'll pass it along.

To give you an idea of what the value has become, one of my engineer friends informed me at an SBE meeting recently that he was involved in the construction of a new transmitter site, a six tower AM DA on the low end of the band. He and the boss on the job scrapped out the left over pieces of copper from the job, and came away with \$1500! Which explains why a Chicago radio station recently lost its entire rooftop-mounted tower's counterpoise. They're baaaaaack!

Loose Ends Cleared Up

Readers of last month's issue will recall the big story about the mega-jerk who was vandalizing our satellite receive system. As I buttoned up that article to send it in to Cris, the perp had just smashed the security system at the front door with a hammer, taking out the camera, doorbell button, mike and speaker. Denver was sending us a camera/DVR setup, and we were getting to our wits end. At that point, we pick up the story.

Jerkweed didn't stop with the front door security setup. Oh, no. He went around to the back door some time later and smashed the security box there as well. Then he went after our electric meter (and possibly our gas meter!) with a hammer. We're not sure about the gas meter, but it hasn't worked since he's been here. We called NIPSCO (or local utility) and they came out with a brand new electric

meter. Jerkweed responded by not only smashing *that* meter with a hatchet, but also by pouring water into the meter box itself, hoping to short out the incoming AC and put us off the air. At that point, two things happened simultaneously. First, the security cameras and DVR caught and recorded him in the act, and second, my assistant Mack Friday showed up and *confronted him!* The receptionist, watching all this on her front desk monitor, freaked out and immediately called 9-1-1. Mack, for his part, belatedly deciding that discretion was the better part of valor, ran toward the station main rear door, thus turning his back on a paranoid schizophrenic who was off his meds and had a hatchet in his hand! That has to be a violation of some rule of... oh, never mind.

Needless to say, Mack escaped, thank God (it was his birthday week, and I was indeed thankful that I was able to celebrate his birthday rather than his life!) Meanwhile, the perp, frustrated in his efforts and totally unmindful of the cameras which were watching him, deciding that the -meetingøwith Mack was his cue to get out of there, did so, vaulting our back fence to the alley behind, his favorite mode of access to our property. But he didnø get far.

The Hammond PD caught the guy a couple of blocks away, hatchet in hand, and as I write this, he is still locked up in the Crown Point Joint, medical wing. Some of you were musing as you read this that the guy had to be half nuts to do this. Wrong. He was and probably still is *completely* nuts. The guy was and is absolutely certain that the satellite receive dishes in our parking lot were putting microwave radiation into his head and causing his condition, and he had to put us off the air so that it wouldnø happen again! (And these folks *vote*, right?) Further, at his trial, he intends to plead guilty to all charges, and then tell the judge why he did it. You can guess the outcome already, heh, heh, heh....

And, from what Iøn seeing in the media, our perp isnø the only nut case out there. First, the reporter who covered the story in the *Times of Northwest Indiana* was just too danged lazy to call me and get the truth about the situation. The guy wrote a story that was total garbage, loaded with misleading statements and out-and-out lies. Obviously, he isnø required by his editor to check his facts. And the comments on the blog which accompanied the story were about on the same level with the perp: very biased and anti-WPWX. I got so

incensed by it that I wrote a rebuttal and put it on the blog. It was twice as long as all the other comments combined, and Crisøreaction to it, when he saw it, was classic: ðNow youøve gone and done it. Youøve confused them with the facts.ö

I cannot credit enough our recently upgraded video camera system. As I mentioned last month, our own Mack Friday had worked above and beyond the call of sanity (as in, fourteen hours of overtime) to get our existing parking lot cameras onto a DVR that we had borrowed from our Beecher site. We had also set up a camera from Beecher on a pole near to the front of the dishes. More is being done and we now have a plan in place to fully implement the system.

Thatø not all weøre doing. A panic button is being installed at the receptionistø desk. It will activate lights in strategic offices around the building. An anti-climb device (kind of a weird moniker for three sheets of four by eight plywood, donø you think?) is being installed on at the base of our eighty-foot tower in the back yard. A new fence is now planned for the back alley side of the building, a wrought iron job, as tall as the city will allow (which ainø much, folks!) and with spikes on the top. We may also add a fence around the two sides of the satellite dish area which currently doesnø have a fence. Remember, our emergency power generator is in there as well, and we want to be very protective of that.

Now, for the other loose end. Remember in April when the WSRB STL was getting such serious interference? For those who need a refresher course, we looked for causes for this problem all over the place, finally pinning down a possible source at the NIPSCO substation some four miles away, but exactly in our antennaø line of sight and co-polarized to boot. We contacted them and everyone else on that tower to get them to help us solve the problem. But the problem vanished as quickly as it came, and it hasnø recurred since.

Now we know why. I got a call recently from the Director of Communications at IDOT with the real truth: The problem was at their end, and caused by their vendor. They were trying to test out a remote control system for their jam-cams (cameras keeping an eye on the I-80/94 freeway to the west) and the RC transmitter went berserk (for a week?).

Nice of them to tell us, at this late date.
Until next month, blessings to you all!

The Portland Report

By
John White, CBRE
Chief Engineer, CBC–Portland

The march of time rolls on. It seems like just weeks ago we were moving the studios and offices to the transmitter building. We haven't finished unpacking all the moving boxes yet, and yet now we are thinking about winter coming as consider preparations to deal with limited access snow and ice conditions.

This month we got a test run as the local power company dropped a sub station and power to much of east Portland. The generator kicked in and ran for about 15 minutes, and of course I had left the building only 20 minutes prior.

Heading back to the building I faced the maze of traffic-controlled intersections. It didn't help that this happened in the middle of afternoon drive time. The rule is such intersections become four-way stops. Everyone agrees on that. What apparently lacks agreement is just what a four way stop is. One definition seems to be, all shall stop and none shall go until the other has gone. Others appear to believe the rule is none shall stop and all shall go until the other has not. Can we have a little happy median, please?

So following a complicated route avoiding numerous intersections I arrived at the building to find the generator complaining of over-temp. Reset and restart. Water temp is 170, normal. Hmm... I have seen a real over-temp climb past 210. Upstairs, the transmitters are back up and running.

I can relax. Or so I thought. Shutdown, over-temp, restart, water temp 170. Been there done that. Checked the coolant level, air flow, nothing amiss. The short-story version is checking through the documentation I found no reason for the false over-temp shut downs.

Calling in the generator people I soon learned of an undocumented 'feature'. Somewhere along the line a low coolant sensor was added.

However the genset controller doesn't have a low coolant latch, so they simply strapped the low coolant sensor to simulate a high water temp condition. But we didn't have low coolant either.

The service tech has seen this before. The sensor is a probe at the top of the radiator. As long as the probe is submerged, a small current flows through the coolant to ground. Ahhhh, says I as the twisty

compact florescent blinks on. The undocumented sensor needs to be cleaned.

Anyone remember the Starguide satellite receiver now replaced by the XDS receiver? Well KKPZ has a brand spanking used Starguide taking a football feed from the Clear Channel Satellite network. Old home week.

Earlier this year I commented about the upgrade from our first-generation HD exciter to the new exporter/exciter configuration. The new combination is much easier to work with and considerably more stable. Still containing many of the Ibiqity mysteries (for example what does the exciter L+R modulation screen indicate?), the foresight of the upgrade is becoming apparent.

Turns out that some of the first generation exciters are now experiencing failures. The mechanical hard drive failures are a weakness of the original reworked computer platform. Many of the new generation broadcast devices are computer-based. So a word to the wise: make a list of station specific settings and configurations now. Later will be too late.



**Rocky Mountain Ramblings
The Denver Report**

by
**Amanda Alexander, CBT
Chief Engineer, CBC - Denver**

What a quick month it has been! We got the burned-out Austin transformer replaced at KLZ. After replacing it, I was excited to not get a tower lamp alarm via text that night, but then, bam! The text came through. The next day I took a look at the lights and it appeared we had one beacon bulb out. We had to wait several more days for our tower crew to make it back out. We have officially been without a tower lamp alarm for over a week at this writing. With so many towers in our Denver cluster, that might be some kind of record!



Many projects await me in October. First on the list is to get mic booms installed in two talk studios. We had been waiting for over a month for the booms to get in as they were backordered. I hope to get it all done within the first week of the month. Next on the agenda is for me to figure out the phone issues in KLVZ. This has been a problem since we were at the old building. During our high traffic call-in shows, the phone lines will go dead for a while before they start working again. We have replaced the 1X6 several times, we replaced the console, and the phone. Our phone guy replaced a card in our phone system which seemed to work for several weeks until a power outage a couple weeks ago. I have no idea what the problem could be. I've spoken to our phone guy several times about the issue and he is at a loss as well. I am going to switch the phone equipment between KLVZ and KLZ. I know the phones in KLZ are working. This will tell me if it is the phone system or the equipment.

We also got the KLTT microwave link up but not fully running yet. The tower crew put in a full day at the office mounting the unit to a mast on our building. Then it took another full day on the tower mounting the microwave and the NanoBridge link down to the transmitter building. It got windy at times and the tower crew lost a nut used to secure the NanoBridge dish because the wind blew it right out of the guy's hand. We plan on putting KLTT audio

on the microwave the early this month. I look forward to getting away from Qwest's T1 line out there.

The next step will be the KLVZ link. The studio end is on its way and soon thereafter we will have the transmitter side delivered. Before we are able to get the microwave on the tower at KLVZ we first have to have the top guy wires replaced with larger diameter wires to make the tower more stable. I look forward to getting it done in October, the last item on our punch list, and actually feeling like the move is 100% done.

October also brings me to my first business trip. I'll be going to California to help my dad and several others set up a temporary transmitter and antenna to do some conductivity measurements at the new mainland transmitter site for KBRT. I have been told my dad will make time to drive over to the ocean so I can see it. Living in Texas and Colorado all my life, the ocean is something I have only seen in the movies! I look forward to seeing it in person if there is time.

I am also looking forward to the learning experience. I am a person that learns by doing. It seems that since I have taken over as chief engineer, nothing major has happened. We moved our offices and studios, and I learned a lot from that. We also had the copper theft and I learned how ground systems are done. I find myself wishing at times something major would happen to a transmitter so I will have the opportunity to learn how to troubleshoot and repair the transmitter at a deeper level that I have in the past. I'm sure that day will come!

This time next month I will have my first business trip under my belt and hopefully will have learned more about how things work in the radio world. I look forward to getting things done around the office that I have not had the time to work on due to various things. So until next time, that's all folks!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

The Eyes of the World Are Watching.

Since hitting the market in 2000, USB thumb drives have become a welcomed piece of everyday equipment for computer users. I remember purchasing my first thumb drive from Dell quite a few years ago, featuring a whopping 128mb of space and priced at just under \$80. I now regularly use an 8gb model and am considering a larger thumb drive, both retailing under \$30.

As with most computing innovations, while the users are celebrating their new useful tool, folks with more malicious intent are developing ways to utilize them to spread malware or spyware for their specific gain. The thumb drive is no different and the risks have been increasing.

I've noted before that I am often more concerned about spyware and malware infecting a computer than a traditional virus. It's simply the world we live in. When a user's suspicions rise that their computer may be infected with some sort of malware, their first concern is the data stored on that machine's internal storage device. They rarely even consider the security implications on the removable thumb drive they plug into that machine on sometimes a daily basis. But a thumb drive can't become infected, right? Wrong!

2008's a US military laptop was infected by malware present on a USB thumb drive. The malware eventually made its way to a series of classified computers within the US Central Command network, sending countless amounts of data to an unknown host computer. If it can happen within the tight security of the US military, it can happen in your office or home. In fact, according to a report by informationweek.com, about 25% of malware today is designed to spread via USB storage devices that connect directly to PCs.

Taking it a step further, a recent USA Today article claims that a malware-laden USB thumb drive could have contributed to the crash of Spanair flight JK5002 two years ago which claimed the lives of 154

passengers. According to this article, malicious software spread via an infected USB thumb drive, found its way into Spanair's fail-safe monitoring computers. As a result of this infection, the system

was slow to send alerts that may have kept that aircraft on the ground. Of course there were a number of other factors that lead to this disaster, but each part contributed to the horrific end result.

Most people have never heard of something called the USB Hacksaw. It's a piece of software that can be secretly

install onto a computer via a variety of different methods and then sit silently, waiting for a USB thumb drive to be inserted. Once this occurs, USB Hacksaw will grab the contents of the thumb drive and send the data to a specified email address. Granted the data could simply consist of hundreds of pictures of your dog Fluffy, but it could also have sensitive financial or other personal information.

Before you start throwing those thumb drives into the garbage, keep in mind that there are ways to protect your data even if you utilize these devices on a very regular basis.

First and foremost is to always ensure that the computer you use is protected by a strong and dependable anti-virus software and anti-malware software. Make sure to schedule regular scans of your computer as well as your USB thumb drive. Yes, you read that correctly. Most users have probably never scanned their thumb drives. Make sure you put that into your normal schedule.

The second warning is never plug an unknown USB thumb drive into a computer. A computer security firm conducted an experiment last year in which they scattered a small number of thumb drives in a parking lot. They were surprised to find that many of the lost thumb drives were quickly plugged into computers by their curious or nosey finders.

That brings me to another aspect of using thumb drives, and that is losing your data by simply



losing your thumb drive. It happens quite often, sometimes with huge risk depending on what data is stored on the thumb drive. Some time ago, Wilcox Memorial Hospital in Hawaii reluctantly informed 120,000 current and former patients that their personal information, including their Social Security numbers, were at risk due to a lost thumb drive. This could have easily been prevented by encrypting the data or by utilizing an access password. As an example, I have a personal thumb drive that contains scanned versions of most of my important documents such as birth certificates, social security cards, etc. This thumb drive is kept under lock and key to be utilized if any of the originals were destroyed in a fire or if we had to evacuate our home quickly. All of the

data on this specific thumb drive is extremely important and therefore is encrypted as well as password protected.

There is a variety of good encryption software available on the market and all are worth the investment to protect your sensitive information. In fact, MS Office 2007 offers an encryption option within the software. It wouldn't be a bad idea to get into the habit of using it.

Never underestimate what could happen and simply be prepared. Although the risk of simply losing your data is often at the top of a computer user's mind, the risk that the data could end up in the wrong hands should be right there with it.

í until next month.

The Local Oscillator
October 2010

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

KLZV ■ Denver, CO
810 kHz, 2.2 kW-D/430 W-N, DA-2

KSTL ■ St. Louis, MO
690 kHz, 1 kW-D/18 W-N, ND

WDCX ■ Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2

WDCX ■ Buffalo, NY
99.5 MHz, 110 kW/195m AAT

WDJC-FM ■ Birmingham, AL
93.7 MHz, 100 kW/307m AAT

WEXL ■ Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D

WLGZ-FM ■ Webster - Rochester, NY
102.7 MHz, 6 kW/100m AAT

WRDT ■ Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D

WMUZ ■ Detroit, MI
103.5 MHz, 50 kW/150m AAT

WPWX ■ Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT

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

WYRB ■ Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT

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

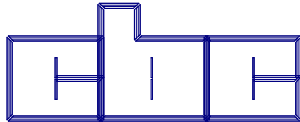
WYDE ■ Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND

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

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

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

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