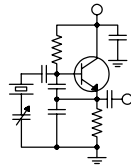


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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Speeding Right Along

Does it seem as if time is passing more quickly these days? It certainly does to me. I can hardly believe that it's 2008 already and that Thanksgiving and Christmas were "last year"! For me, the whole year sped by at an incredible pace.

Some of this effect is, I'm quite certain, a function of age. As we get older, our perspective on time changes. At age 20, we have all the time in the world. At age 30, certain milestones (like 40!) begin to come into view. At 40, some folks get hit hard with a realization that they're very likely halfway done. For me, as I sail through the middle age years, the realization of how few years I have left to work and how quickly the years pass colors everything I do to some extent.

But I really think that our perception of time is colored by our culture and particularly by our technology. Owing to technology, life has a faster pace these days than when I was growing up in the 1960s. In those days, people wrote letters. They read newspapers to get the latest happenings. Western Union was still the fastest means of delivering a written message across a long distance. Things are so different today. We email and text message one another. The news cycle is instant rather than the deadline system of 50 years ago. We cook our food in the microwave oven. In the workplace, computers allow us to do much more in a fraction of the time. Even our email and Internet access are completely portable (yes, I keep a Blackberry strapped on at all times!).

In our own industry, technology is advancing at a breakneck pace. It is a rare thing these days to find a major market station with an analog studio. While AES and other digital formats have been around for many years, we're way past that now as we use IP technology to transport our audio all over the place. Many of our on-air consoles don't

handle audio at all but rather simply provide a user interface for the operating system. Our STL systems also often employ IP technology, and CAT-5 wire has replaced audio cable in our studios and transmitters.

In the first couple of decades of my broadcast engineering career, I didn't see the kind of technology advancements we are seeing today. Our source media were vinyl records and NAB carts. A big "advancement" in technology was the auto-aligning cart recorder (such as the ITC "99"), but this didn't really represent a technology advancement; it was more of a refinement. Turntables, cart machines and reel-to-reel recorders got better but it was the same old technology. We didn't really have to think too much about what our media would be in coming years. Upgrades in transmitters, STLs and antennas were also just refinements of the static technologies.

The budget process presents some real challenges for me these days. I almost need a crystal ball to figure out where we will be a year down the line. Think back just a few years. DAT was the medium of choice for program storage and distribution. Then almost overnight, MD became the new standard. That one came and went in a hurry. As CD burners became commonplace, we started moving in that direction, but try and buy a rack-mount component CD player these days! Hey, forget the rack mount... I was in Best Buy with a friend last month and he was looking for a component CD player and they didn't have any; they don't even stock them anymore!

So where will we be a year from right now? What will our technical plants look like? What will our *industry* look like? One thing I see emerging is the Internet audio stream as a primary delivery means. Just as cable television has diminished the importance of the over-the-air television transmitter and antenna, I suspect that the Internet will likewise diminish the importance of the RF components of

radio stations in coming years. As Wi-Fi and WiMAX move from “hot spot” services to market-wide availability, how much more important will our Internet streams become? And what must we do to attract and hold listeners in a sea of Internet streams? The Internet extends our reach to a worldwide audience, but it is also a great equalizer!

I find all this a little scary, but I also find it to be exciting. Our technical skills and creativity are going to be stretched in the coming years as we look for ways to keep our industry not only viable but also *vital*. Are your *skills* up to the challenge? Are *you*?

Better strap in and hang on. I think we're in for a ride.

Daytime Skywave

Over the past couple of months, I have heard reports from a number of sources of daytime AM skywave propagation. As a rule, skywave propagation occurs only at night. Ask a group of radio engineers why and many will tell you something about skip-producing ionization occurring only at night. That is a misconception. The truth is that the D-layer, the innermost layer of the ionosphere, is absorptive of RF radiation when ionized. As such, when ionized, it greatly attenuates RF passing through it on its way to the higher E- and F-layers (in both directions). The D-layer usually becomes ionized during daylight hours, attenuating lower frequencies. Higher frequencies are not affected nearly as much. For you ham operators out there, that's why the 160 and 80 meter bands are dead during daylight hours but come alive at night.

We currently find ourselves at the very bottom of sunspot cycle 23. It has not been uncommon to find *zero* observed sunspots in recent months along with very low x-ray flux values. As a result, the D-layer is not ionizing as it normally does and is allowing signals in the AM band to pass through to the higher reflective layers of the ionosphere. Those signals are being reflected back to earth as they normally do at night. The only thing that's saving us from a mess of daytime skywave interference on the AM band is the fact that with low sunspot numbers, the higher layers of the ionosphere are not being heavily ionized and as such are not as reflective as they might otherwise be.

I observed this phenomenon firsthand last month. Driving in the mountains west of Denver, I was listening to KOA on 850 kHz. In the area where I

was, it's not uncommon to observe skywave-to-groundwave self-interference occurring to KOA at night. The groundwave and skywave carriers cancel out, leaving only the sidebands, producing highly distorted recovered audio that changes with distance to the station. I heard exactly that effect at 10:00 AM on Christmas Eve. Others have reported observing a co-channel beat in the FIM indication while measuring null radials of AM directional antennas.

This is an interesting phenomenon, and it should begin to diminish in coming months (assuming that the eleven-year cycle holds true). In the meantime, AM engineers should be aware of it and ready to offer an explanation to GMs and listeners. We must also be alert for changes in our null radial monitoring point field strengths that may result from daytime skywave propagation. I suggest that until the sunspot numbers begin to rise, all MP measurements should be made as close to midday as possible. Watch and listen to the FIM closely for signs of co-channel interference.

The Listener Experience

As we begin the New Year, now is a good time to reevaluate each of our stations and the overall listener experience as it relates to each. A few questions to ask:

- Is the *sound quality* as good as we can make it? Can we do anything to make it better?
- Is the signal *reliable*? Are there interference or coverage issues that we can address?
- Is our *RDS* and *PAD* title/artist information working properly and synched with the audio?
- Is the *Internet stream* working properly? Is the overlay set up correctly and working? Is the sound quality as good as it can be? Is the title/artist information present and correct?

One thing that I'm continuing to work on is iTunes tagging. Apple has been less than cooperative. At this point, all we lack is the actual iTunes catalog information. When we get it, I will distribute it to the stations so that the database entry for each song can be appended with the metaID containing the iTunes catalog number.

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

Hello, and Happy New Year to all from Western New York!

I'm sure by now that many of you have read in the trade magazines the arguments recently raised by a Western New York Broadcaster against HD Radio. The station, located in Avon NY, has submitted an interference complaint to the FCC against WBZ in Boston a 50 kW Class A station on 1030 kHz. The Avon station, which operates with 20 kW day/500 W night on 1040, claims that the IBOC signal from WBZ is interfering with its protected contour and has requested investigation of this by the FCC. I have, on numerous occasions while driving in and around the Rochester area, tuned in WYSL and heard *no interference* from first adjacent WBZ. However, in WYSL's defense, the WYSL signal is unlistenable at night to the northwest of Rochester. There is definitely some digital hash heard, almost at the same level of the originating audio.

I am curious, however, as to why no other first-adjacent stations have complained about digital interference emulating from WBZ? A quick check shows that on 1040 kHz there are two stations in the vicinity, one in Flemington, NJ and the other in Timmons, Ontario. On 1020 kHz, there is one station in Connicut and another in Kenoia, Ontario, none of which have levied interference complaints against WBZ with the FCC.

It is no secret that the owner of WYSL, Bob Savage, is outspoken against HD-R, and has been since the introduction of this new technology (long before WBZ fired up its digital carriers). It seems ironic that his station is (so far) the only one affected by HD-R interference. Sure, there are stations that could be heard well beyond their predicted contour that can no longer be listened to because of the added bandwidth of digital broadcasting, but this is the tradeoff for a much improved, more listenable AM

broadcast. As more AM-HD stations go on-line, especially at night, I have no doubt that we will hear more signal complaints (especially from DXers) from those opposed to AM-HD. I for one think that this is a remarkable improvement to our AM stations and will continue to support this new medium and do all I can to improve our listeners' HD Radio experience.



WDCX – Buffalo

The installation of the new transmitter building is moving along at a snail's pace. However, in the month of December, we managed to get the electricity into the building and the 3" i.d. support posts in for the ice bridge. Don Boye of Western Tower Service will now cap off the top of the support posts to eliminate any moisture getting into the pipes. He will then construct and install the ice bridge from the tower to the new building. Once this has been completed, we can forge ahead with moving the coax and transmitters over to the new building. All this, of course, will be done weather permitting. Buffalo weather is too unpredictable to plan much more than a week ahead, and this sometimes can be a problem. The weather sometimes seems to change by the hour.

WRCI / WLWZ – Rochester

The month of December has seen a flurry of engineering activity at the Rochester stations. In the wee hours of the morning on Tuesday, December 4th, the WLWZ transmitter remote control called and reported the Nautel's carrier off the air. Repeated attempts to get the transmitter back up were unsuccessful, so I headed off to the transmitter 70 miles away to see what had happened. We had not experienced any bad weather recently, and the utility power appeared to be okay. Once I got to the site, I noticed that the NE-IBOC computer had locked up, removing drive to the Nautel ND-5. A quick reboot

took care of the problem and got us back on.

Before I installed the HD-R modifications to the Nautel transmitter, (in fact, ever since this transmitter has been installed) we have experienced problems with the exciter switching from "A" to "B" randomly. After a thorough investigation of this problem, it was found to be the Burk remote control was causing the control channel to activate randomly when the operators would switch from day to night pattern, so the exciter "B" switch was removed from the remote. If I had been able to switch to the other exciter via remote, I could have delayed my trip up there until later in the day. We will be replacing the Burk later this year, which will also give me the opportunity to clean up and document the wiring in the transmitter equipment rack and finally put this problem to rest.

Another problem we experienced this past month was the failure of the Intraplex transmitter frame. The Intraplex digital STL handles the audio for both stations and provides satellite back-haul feeds from the transmitter to the studio. We first thought that there was a problem with the fiber optic line (which has been a problem in the past). I had Ben Martin reboot the studio and transmitter frames to see if they would come back up. While at the transmitter

site, Ben noticed that there was no power on the transmitter frame. I had him replace the EIA power cord, but still no power. I jumped in the Jeep and headed up to the WRCI transmitter site to evaluate the problem.

When I got there, I found that both the main and redundant power supplies had failed. To get us back on the air, I had Ben go back to the studio and remove the redundant supply from the studio unit and bring it out to me. I then installed it in the transmitter frame. I have since ordered replacement supplies for the Intraplex from Harris Corporation, as the switching supplies cannot be repaired in the field. Anyone knowing of a supplier that can provide just the power supply module, please let me know. I would like to have a couple of spares on hand, and the cost from Harris for the entire board makes this cost prohibitive.

That about wraps up another month here in the Northeast. Until we meet again here in the pages of *The Local Oscillator*, be well, and *Happy New Year* to you and yours!

The Motown Update

By
Tom Gardull, CBRE
Chief Engineer, CBC–Detroit

We had several T1 circuits installed last month. We were motivated by a strange set of economic conditions. Ten years ago, our local telephone company, now AT&T, installed fiber into our studio building so we could have T1 service for the WEXL audio and control circuits to the transmitter site. They gave us a 5-year contract price of around \$400 per month, and five years later we renewed at the same rate. This year is the due date for the second renewal. I made an early contact with our account rep that came back with a renewal price that was triple the original rate and a term that was only three years. We had our rep check with his supervisor because we could not believe the numbers. But at the end-of-the-day, they were sticking with the new \$1100 price.



Cris said to check with some of the alternate telephone service suppliers. Most of them did not provide T1 service, but two or three could. The lowest quote came back from a company called McLeod. They actually had a lower price than we were previously paying. So they became our provider for the T1 to the WEXL transmitter site.

Their rate was for T1 service was low enough (especially considering that they waived the installation fees) that we considered T1 service to replace the 8 kHz audio program loop and data circuit for the WRDT nighttime transmitter site. As it worked out, the T1 cost was lower than what we were paying for the combined separate services! Since we are using

our new APT Oslo T1 terminal equipment for WEXL, we had retired QEI CAT-Links available to use for WRDT terminal equipment. As a result, the WRDT night site gets several additional high quality audio paths to the site, and we also gain a high quality return audio path from the night modulation monitor so we can better hear our 20-watt night signal. So McLeod USA became the provider for WRDT night transmitter site.

Here is part of the strange economic condition. McLeod has no major facilities in Detroit. They have no T1 service. They subcontract it all out to AT&T. McLeod leases facilities from AT&T. AT&T came out and made all the installations at the studio and transmitter sites. The very company that wanted to triple our rate is selling service to McLeod who then resells to us at a rate lower than we were paying AT&T directly in the first place! McLeod has to make a profit, and they are making it charging us less than AT&T was, yet AT&T is doing all the work!

AT&T would have had our renewal if the rate had not gone up so far. But in the end, we still have AT&T service; a middleman got involved and had a better price for the same circuit.

The only problem we've had so far involved line coding protocols. We wanted to switch our APT Oslo terminal equipment to using the more prevalent B8ZS line coding for the WEXL path. The Oslo can easily be converted with several keystrokes and a reboot. We ordered B8ZS for the WEXL T1. However, since WRDT was to reuse CAT-Link equipment, we wanted to stay with AMI line coding which the CAT-Links utilize. Most phone companies are predisposed towards B8ZS, so the installers mistakenly setup the WRDT circuit for B8ZS instead of AMI. We thought it best to leave it that way and forestall future confusion. We changed the channel service units settings for the CAT-Links to make them do the translation from B8ZS to AMI, and it all works.

Now I have to keep those retired CAT-Links working. I have many spare frames from which to borrow module cards. So now we have more digital service and at a better price for two stations.

News From The South

By

**Stephen Poole, CBRE, CBNT
Chief Engineer, CBC-Alabama**

Happy New Year! I hope that all of you had a blessed and beautimuss Christmas; Sandy and I did – well, we tried to... poor Sandy has been fighting a sinus infection for some time now, so say a little prayer for her if you would. And in the “answered prayer” department, my mother had her surgery and we got a good report from the doctor. Hey, they even caught the Red Mountain copper thief, mentioned in last month’s issue; we may be on a roll here.

I enjoyed some vacation time over Christmas

as well, but now, I’m headed back and rarin’ to go.

2008 is going to be another busy year: we’ve got a new building on the way for WDJC this month, and that’ll tie us up for several weeks. Those of you who’ve moved large transmitters, especially old ones, know that there’s a lot more to it than just, “stick it in the new building and plumb it up!” Then we’ve got to redo the ground screens at the tower bases at WXJC, and we’ll be installing security systems at our high-risk sites.

And that’s just the big stuff; there are plenty of other things on the schedule for this coming year.



WRVC-8 Remote Controls

We received several of these before I went on vacation and have installed them at all sites but one. Ed Dulaney has reported his experiences out in Denver with this unit at AM sites; I'm having similar joys at my 50 kilowatt, WXJC.

Our solution has been to mount it in a shielded rack, with shielded cables for the sample and control lines and with lots of grounding all over the place. With filters added to the inputs, we can use it. It's not affected by modulation so much as it is by RF. Good tantalum capacitors paralleled with high-Q ceramics is the best way to cure that.

Once we got it shielded (and re-shielded) and filtered (and re-filtered), though, it's a decent unit, especially for the price. It suffers from the same Geek Syndrome™ that affects the Sine Systems remote control: for example, to program some dial-up functions you have to enter memory addresses, followed by cryptic codes, and the manual is barely adequate.

But the built-in Web server is nice. Getting the email alerts to work correctly was a pain; the manual devotes about a half page (only in passing) to that. Assistant Number Two, Todd Dixon, patiently bull-dogged that one until he figured it out. You have to put "<>" brackets around the names and you have to put in raw IP addresses for one thing. Good job, Todd!

AM HD-R Revisited (With an Assist From Ed Dulaney)

Alabama is one of those states that allows anyone to purchase and use fireworks. The wisdom of this is certainly debatable (the very idea of rednecks in possession of Chinese-made explosives ought to send you screaming into the shrubbery), but it allows me to make a point.

Around the 4th of July and December 31st of each year, I am subjected to all sorts of amateur fireworks displays. It's impossible to sleep because of the constant booms and bangs (and the occasional "yee-hah!") as my neighbors fire off the things for hours on end. The air will be so thick with burnt powder, it's hard to breathe at times. If you call the police, they might respond if it's particularly egregious, but normally, they'll just let it play out. Their definition of "disturbing the peace" extends to craters in excess of three feet in diameter... and, of course, to loud car stereos. That's right, heaven forbid that a teenager drive past them with windows rattling and the trunk lid thumping. Justice is swift in that case.

Not only is this a "go figure" moment, that mental image lets me segue into what will hopefully be the last thing I say about AM HD-R for a while. AM is subject to destructive and debilitating interference from computers, storms, sunspots (or the lack thereof), noisy car ignitions, power lines and you name it. With the move for a "greener" world, that's only going to get worse in the future. For example, just switching from incandescent to fluorescent lighting (thanks, in large part, to those little "mini" screw-in replacements) could have a major impact.

We can't do much about these things, though, so you don't hear many complaints about them. For that matter, you don't hear many complaints about AM stations with old transmitters that are groaning and splattering under the weight of NRSC preemphasis and way more processing than they were ever designed for. (The licensee will turn it down for the annual occupied bandwidth measurement, then crank it back up. Heh.)

But heaven forbid that we contemplate a carefully-controlled use of the NRSC mask to bring AM into the digital age. It's unconscionable that we should tuck some very low level digital emissions well inside those limits! Do you see a parallel here?

Radio World ran a guest commentary from yours truly in a recent issue, for which I'm grateful. In it, I pointed out that digital is AM's last hope because digital is far less subject to interference. Everything else that has been proposed is either not feasible (ex., finding more spectrum for an entirely new band) or essentially leaves us with interference-prone analog operation (ex., C-Quam or CAM-D, which uses digital only for the high frequency and stereo information).

We have been asked to listen to the concerns of the anti-AM HD-R crowd. Hey, that's fair. I'm certainly willing to. But in return, I want them to listen to me, and in particular, use established engineering practices (not to mention common sense) when making their arguments. I don't enjoy the name-calling, either, but folks, there's a reason why some of those on my side call these people "Luddites."

Telling me about interference on a consumer receiver is not proof; there are too many variables. Measurements taken with a calibrated field strength meter are better, but even they don't mean much unless you carefully follow good engineering practice. Ideally, you'd take readings in the middle of the day – NOT at night – with the cooperation of the interfering station. (The station should be willing to cooperate; if not, the FCC can force them to, if they think your complaint has merit.) You'd take a reading

with the suspected HD-R transmitter switched off, another reading with it switched on. Then you'd do that again and again in different locations and compare the readings very carefully.

Getting the station to cooperate is especially important with nighttime skywave complaints. Otherwise, how can you even begin to PROVE (that's the operative term) that the problem comes from the suspected HD-R transmitter and not from some other source? Skywave is so flaky and crammed with interference to start with, I need to see a clear, concise methodology, or I don't know what you're measuring.

Here's the thing: there are plenty of objections that could be raised against AM HD-R. I have my own little list here. During the transition, there WILL be problems with broadband receivers sounding "noisy." To a small market broadcaster, it's expensive. The codec and modulation scheme, while already a marvel, could stand improvement. Ibiqity needs to release complete technical details and specs for the system so that everyone can pitch in and help out, too. I'm tired of the secrecy!

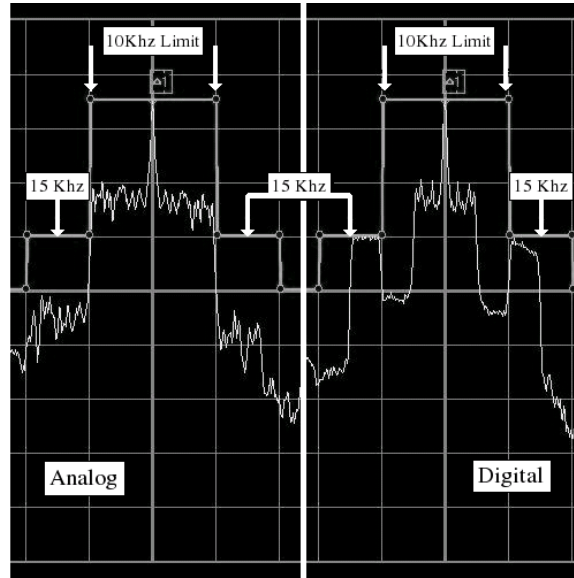
But the thing is, we're not really hearing these objections, except as peripheries. Why AM HD-R's opponents have chosen interference as their key issue is a mystery to me, *because it is their weakest argument*. IF we follow established engineering principles and IF we accept only verifiable, correctly-done measurements, most complaints about AM HD-R interference fall flat.

As proof of that, there have been virtually no complaints from the public since nighttime HD-R commenced on the AM band. A few scattered here and there (mostly from AM DXers), but the anticipated flood never came. (And that, I think, frustrates the anti-IBOC crowd more than anything, but there's nothing we can do about that.)

And now for my claim that I could build a perfectly legal analog transmitter that caused *more* adjacent-channel interference than a properly-done AM HD-R rig. To prove that, here are some spectrum analyzer screenshots that Ed Dulaney sent me. I tried

to get these into the Radio World commentary, but unfortunately, it had already gone to press:

The one on the left is the analog, the right is HD-R. Same transmitter, same antenna system. I've



Spectrum Comparison of AM Analog and Digital

marked the 10 kHz and 15 kHz limits on both signals. Remember that the 1st adjacent channel starts *halfway through* the 10 kHz region (at 5 kHz). Carefully study the amount of signal that is making it out to the 10 kHz limit. The analog, and not the HD-R, would cause more interference to the first adjacent channel.

Bear in mind that this is a Dulaney-maintained, state of the art Nautel transmitter with a top-quality Omnia processor, too. A tube box being overdriven by a Dorrough "DAP" through a cheap NRSC "stick-on" would likely be worse (due to gobs of IM

distortion in the modulator, if nothing else – and if it's an old solid-state Harris MW-series, let's just hope the station isn't using that horrible "Modulation Enhancer").

AM HD-R does add emissions out to 15 kHz (and you can see them in the image on the right as well), but these are at a very low level – at least 28 db down. The key, though, is that from 5 kHz to 10 kHz, the emissions are even LOWER. The material between 5 kHz and 15 kHz, by any reasonable measure and at any distance likely to affect an adjacent-channel station, is very close to the background noise level. Do the math.

In the well-covered case of WYSL, Rochester, NY vs. WBZ, Boston, MA, I have a proposal: let's ask WBZ to switch back to full analog for a series of tests, with aggressive processing and normal NRSC preemphasis. (I'll even loan them an Omnia, though I'd be astonished if they didn't already have a great processor.) We'll have them play music instead of talk (after all, they could change formats at any time, right?). Let's compare the interference. Science doesn't lie and physics don't cheat: if WBZ's IBOC can interfere with WYSL, then so should their analog with heavily-processed and music out to 10 kHz. It may not sound the same – "swishing" and "chatter" as opposed to a constant low-level "hissing" noise – but to the listener,

interference is interference.

For the last time: is AM HD-R perfect? Heck, no. Is it the best way to move AM into the digital age? I honestly think so. If you want to object

about it, that's your right. All I ask is that you get your facts straight.

Enough! I'm done with HD-R for now, and like you, I have work to do. Until next time!

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

The Year of Copper Theft

The year 2007 might be remembered for a lot of things, but for me, the first thing that comes to mind is the copper theft problem we had in this area. For the St. Louis operations, we got hit hard on one of our T1 lines that connects our studios to the transmitter site.

In the first ten years of the stations' operations in St. Louis, problems with the T1 lines were experienced on a regular basis. But since we made the move to our new studios, the phone company switched out some old cable and we moved to a new multiplexer (the Harris Intraplex), the T1 line problems had become a thing of the past.

In fact, some time early in the year, I can remember making a comment to one of my coworkers that we had gone more than two years, almost three, without a problem on one of our two T1 lines. Talk about your "knock on wood" moment.

Due to copper theft, KJSL got taken off the air six or seven times in 2007. Most those events occurred in October and November.

We were not the only station in the St. Louis area that had this same issue. At least two other stations that I know of were taken off the air due to copper theft to their Telco cable or in their ATU wiring. And radio stations were not the only ones affected. In fact, even some of the metal recyclers were getting hit by the thieves.

Toward the end of the year, the problem had become an epidemic. Fortunately, some of the people doing this were starting to get caught. One of the more interesting stories belongs to my backup. He works as a contract engineer for several St. Louis stations and was storing some copper items in his garage, including a six-bay FM antenna. He got hit a couple of times, apparently by the same person, but

became frustrated by the fact that the police did not have much to go on. He decided to install motion-activated Ethernet cameras in his garage. Sure

enough, the copper thief struck again, but this time he was caught on camera including a picture of him removing his fingerprints from the doorknob. Looks like he will have his New Years plans already made for him.

The good news on this front is that the state legislatures are working on stiffer regulations for the metal recyclers to better

track the identities of individuals who bring in items for recycling.

LED Tower Lights

We took a small step toward getting our St. Louis towers up to date with the latest in tower light technology. We had one of our KJSL towers with an obstruction lamp outage. The decision was made to not relamp the old incandescent fixtures but to start to changeover the four towers in St. Louis to LED fixtures.

We had hoped we could change out all four obstruction fixtures on this tower in one morning and then spend the afternoon getting some tower work done over on the KSTL tower for the Canopy project. However, it took over six hours to get just two of the four fixtures changed over. The main problem was that the old fixtures were frozen on with years of rust and paint. I do not know how long these fixtures were on the tower but I am guessing that they were not there originally when the towers were erected in the 1930s.

LED tower lighting brings the promise of not only saving a lot of money on electricity, but the potential to save on costs for relamping the towers every year. It will be interesting to see just how long



these fixtures last. Our hope is that it will be a long time before an LED outage is reported on these pages.

Canopy Project Update

In last month's column, I outlined a plan to replace the problematic T1 used as the link between the studio and the KJSL transmitter site. I had hoped that by now, we would be further along in the project. Our plan was to have this functional by mid-January, but this time frame was based upon the idea that we would have all the work done except for mounting the hardware, dish, radio, etc. at about 250 feet on the

KSTL tower before the end of December. However, due to ice, snow, wind, rain and holidays, we haven't been able to get much accomplished. We were able to get a tower crew in here one day, but that had to be devoted to a tower light outage problem. We had hoped to get the electrical cable and utility box mounted on the KSTL tower when the tower company was in town to change the obstruction lamp fixture on one of the KJSL towers.

I am hopeful that we will still be able to get this project accomplished by late January. I think we just need some good weather in the early part of January and we will reach that goal.

Catalina Tales
By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! This has been an eventful month here at our island-based transmitter site as we have finally completed our tower re-guy as well as several other projects. The tower crew was forced to repeat their trip to and from the island as weather made the job too dangerous to continue after the first trip.

Upon the crew's departure after the first attempt, I noticed our pattern was way off the licensed parameters. The reason for this wasn't clear, as we were using the same insulator spacing as the previous guys. The tower crew left a couple of nylon ropes attached to tower two and told me that they took everything metal off of the tower. Realizing that nylon rope would not affect the pattern like I was observing, I went out to inspect the towers myself. I found two nylon ropes attached about 180 feet up tower two and attached to a stake at the ground end. Everything else seemed to be as it should be so I went back inside to continue my adventures trying to tune the array back into tolerance at the phasor. I finally came to the point I was at the end of my coils and forced to go back outside to the ATU, so I decided to give my friend Joel Saxburg a call. He came over to the island and we got back to work. He, too, was amazed at how far off the array was considering there were no electrical changes.

Joel and I decided to go back into the tower field and instead of just looking over the tower, really

spend some time studying it. I grabbed my binoculars and off we went, out with the buffalos. This time I

studied each guy from top to bottom with the added benefit of my binoculars and sure enough, I spotted what appeared to be a preform (cable grip). Knowing that a preform does not work very well attached to a nylon rope, I tried to get a better view at what it was being used for. We realized that the nylon rope we first believed was attached to the tower actually was attached to the loop end of the pre-form and

the pre-form was attached to a 60' piece of steel cable that was then attached to the tower at about the 160-foot level, thus top-loading the tower and wrecking the current distribution. Now things made sense, so we called Cris and, after we verified our monitor points to make sure we were protecting KCBS and the others, Cris filed an STA with the FCC to get us by until we finished the project. The crew returned a couple weeks later and we got the thing finished over a weekend. Overall, they did a very good job considering all the *island factor* they had to deal with.

KBRT has been using satellite for STL since the wildfires that left us without phone lines or power. Though we have since had our power restored, the phone service has left a bit to be desired. AT&T has decided that they don't want to do any more than they are forced to, leaving us running on a very "moused" system. This being the case, we have decided to remain on the satellite STL and it has been



flawless. The T1, however, has been a disaster as have our phone lines since the fire. We are continuing to explore new ideas to make KBRT more and more reliable and to make us as immune from the *island factor* as physically possible. This really requires some *out of the box* thinking since things are really never *business as usual* here on the island.

We are currently deploying a commercial grade satellite based internet system as we have outgrown the HughesNet system that we installed to get us up and running after the fire. This new system is capable of not only much higher bandwidth but is also much faster as they have avoided the lag-time found on the Hughes systems by a combination of buffering, proprietary software/hardware and by not overtaxing their system as Hughes seems to do. This will allow us another avenue to run remote control as well as streaming audio in case we experience and outage on the STL satellite system.

Besides this new satellite system, KBRT now has in place two generators as we were forced to add an additional diesel generator after the island propane supplier was unable to keep up with our demand during the more than two months we were forced to run completely on generator power. The diesel unit is a trailer-mounted portable generator allowing me to transport it in case we need to ship it off island for service. Being diesel fueled, this unit also allows me to purchase fuel in multiple five-gallon containers at our gas station and truck it to the plant myself, making us more self-reliant in one more area as we do not have to rely on delivery that has proved problematic.

As you have most likely already learned from my previous articles, getting any kind of service up here at our island-based site is very challenging to say the least. The island services are very slow to respond if they respond at all, and logistics make bringing a service from the mainland quite a challenge. Each of these steps we have taken into new technology has lessened this issue, making us more self-reliant as well as making the overall plant more efficient and reliable. A fire like we experienced here is always an awful thing to have to go through, but it is interesting how even an awful thing like the fire can bring on great changes as things rebuild. As I have mentioned in previous *Local Oscillator* contributions, our electrical power has never been more stable now that they have build a new grid from the ground up, and each step we continue to take here brings us closer and closer to perfection.

We are looking forward to the fence crew arriving hopefully in the next month to replace our tower field perimeter fence that was badly damaged by the wildfire. As always, this will bring on new challenges, though I am trying to tackle as many of them as I can before they arrive. As usual, I will keep you informed on any *island factor* situations worth writing about as no matter how well I plan and evaluate the project time and time again, something bizarre always seems to arise and keep us entertained.

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

A Possible Answer to Copper Theft

Much has been made lately, and rightly so, about the issue of copper theft and how to deal with it. I have to admit that until now, I've been wondering what to do myself. With three of our four transmitter sites set out in the middle of absolutely nowhere (albeit one of them next to a main state highway), the



need for better security and immediate alarming has become acute.

One of the problems we all have involves the fact that with digital operation and the need to control all sorts of things at any given site via the Internet, the restriction on the number of metering, status and control options in the over 25-year-old design of the present de facto

remote control system (and you all which four-letter word I'm referring to) has made such a task more daunting. Under the present system, monitoring or controlling something rather important may have to be sacrificed for the sake of security.

Well, maybe there's help coming in via the back door. Here in Chicago, we recently raised the STL dish on our Lansing tower by some 60 feet. As part of that project, the decision was made to replace the existing coax, lock, stock and barrel, to prevent possible problems from splices further down the road. Our tower service supplied the new line, and we ordered new connectors from our gal Mo at RF Specialties. The tower service told us they'd be using new Andrew stock, and we were able to get the connectors to match.

During the job, I had a chance to examine the new line up close and personal and found something wonderful. The outer conductor of the new LDF-type line is no longer pure copper, but rather *aluminum!* There is copper plating inside, of course, but think of the ramifications here. The mixed metal composition of the coax now makes it almost worthless to copper thieves. Yes, and one of my local recycling centers concurs. Aluminum and copper in and of themselves are valuable, but not when they are plated to each other. Now, all that needs to happen is a sign telling whoever has designs on our copper that the copper isn't there anymore. Oh, yes, that's going to happen! Further, I'm going to see about changing the coax arrangements at another one of our sites, where we use 3-1/8" rigid line in two runs, and replacing them both from about 30 feet up the tower into the transmitter building with that new-fangled mixed metal coax. Then up goes the sign there.

Another something: LDF-type coax is not acceptable to recyclers unless the outer jacket and the inner dielectric are removed. Doing that is too much work for the copper thieves. Burning off the outer insulation doesn't help either. I came across a couple of guys trying to do that one day a few months back. They had some LDF they were trying to burn. Didn't work. Wasn't accepted. The chemicals from the burning plastic ruined the copper for recycling. And the air pollution!

Now understand that we also intend, at some point, to cover our bets with some new video cameras. The lighting is already out there, but we can't count too much on that since the copper thieves, if armed, will just shoot the lights out. How we intend to get the video images back via the Internet is another story. We don't have Internet access at two of our sites, except through our over-the-air STLs and

T-1s. We're going to have to work some of that out, but we will.

So far, we've been lucky here in Chicago. No, make that "blessed". No copper theft here, yet (knock on Formica). So, we still have time to work this strategy out. We have contacted the three (yes, *three!*) local scrap yards, and I mean local, as in, within a quarter mile of our 92.3 FM site, and they are hip to what's going on. Come to think of it, the next time I'm over there, I'm going to take a couple of scrap pieces of our 3-1/8" and 1-5/8" stock, with inner and outer conductors, plus a couple of pieces of Heliac or LDF-5 and -7 line. You only need about six inches of each, inner and outer conductor. I'm going to take several of my business cards and work out an arrangement with them. There may be an issue in that the recyclers get a lot of copper pipe of all sorts of sizes, and, you guessed it, the coax looks to them just like the plumbing stuff. This strategy also doesn't very well cover something like copper ground cable or wire, but one has to start somewhere, so we are. The long and the short of it – get cozy with your local scrap yard, let them know you exist and what the problem is. This is Chicago, after all. A little schmoozing goes a long way. I'll bet it would work where you are, too.

A Little Trivia Here

I'll bet that you didn't know this one. I didn't, either, until I went to the Indiana Broadcasters Association Engineering Conference in September. The folks in the know there informed me that if a tower is not used for transmitting anything and just has receive antennas on it, it is virtually untouchable by the FCC where tower registration and other issues are concerned. This is a major loophole and one which I'm seeing exploited here in our back yard right now. The tower I'm referring to is owned by the Illinois Department of Transportation (IDOT) and is located immediately east of our Lansing tower, along I-80/94 and right at the state line. It's almost identical to our own WSRB free-standing tower, except that it's 70 feet shorter. I was told by the construction foreman at the site that the intent of the tower is to have high-resolution cameras mounted on it for traffic monitoring. That's not a bad idea since 80-94 is one of the busiest pieces of freeway in the Midwest. The thing is, since the tower was built last summer, it has had no cameras on it and no antennas. There is no building next to it or a fence around it. I've seen kids climbing that tower and there's nothing anyone can do about that for now. There is no tower registration sign anywhere near it. Tower lighting has been sporadic. For months there were no lights,

and when there were, the beacons didn't flash. That's particularly dangerous since the Lansing Airport is some three miles south of the site, and the tower is almost in line with the airport's north-south runway. The tower lighting has stabilized, for now, with the two beacons alternately flashing, but at about 120 pulses a minute, which is outside of regulatory standard. It's not a good situation, at least not yet.

There is a foundation in place for a building, and we trust that if and when there are antennas and transmitters attached to that tower, the registration, fencing and other legal niceties will follow. But I'm not betting the rent at this point. First of all, Cris Alexander checked the FAA records and found nothing on that particular tower. Second, this tower is owned by an agency of the State of Illinois. They may figure that they are above the law (it's the same attitude which has the governor of said state under investigation by the FBI these days) or that it isn't time to do all that other stuff yet. It could be that the budget for the completion has been held up, which is likely since the state legislature is three months behind in passing one. Don't get me started on that.

There is a point here, and it is this: something needs to be changed in the Federal rules regarding towers. It makes no difference to an airplane pilot if a tower has transmitters attached to it or not. If it has been erected without following the rules for towers which do have transmitters attached, it's still a hazard to air navigation, especially if there is no record of its existence. To this point, the FCC has jurisdiction over towers with transmitters hooked on, since they control the licenses of the transmitters which are attached to them. The problem is, no transmitters, no jurisdiction. It's time for a change where that is concerned, that the FAA had some sort of direct authority, although at the moment I don't know how without licensing that the FAA could wield any clout over the situation. This sounds like something that the SBE, or the AOPA or some other such organization could tackle, by submitting some sort of rule-making petition. But I'm not holding my breath there, either. Would someone else like to answer these questions? I'd sure like to see, and hear, the input.

STL issues

We've had more than our share of STL problems this past month, and from that, we've learned a thing or two that I'd like to pass along. Let the record show that we run StarLinks for our main STLs, and Moseley 6000 series equipment for backup.

First, getting the StarLinks to work at 44.1

kHz sampling rate for four channels is tricky as all get out. It requires a robust signal, to say the least, and is not easily attained through DIP switches and reprogramming in the field. I bet we drove the Moseley CSD person nuts until we finally gave up on one transmitter and sent it back. Had to do the same with the other one, as well. Once they were set up at the factory, they worked fine, but as I said, it's real touchy to work in the field.

Second, I don't know which signal meter to believe. When the StarLink Received Signal Level (RSL) is reading around -55 dBm (10 dB below the acceptable range of operation in four-channel 44.1 kHz sampling, says the factory), the 6020 receiver is sitting at around 300 or more uVolts. And the StarLink receiver will *still* receive the transmitted signal satisfactorily. So, you figure it out.

Third, if you're running a StarLink to one transmitter site and a 6000 series signal to another transmitter site, cross-polarized from the first and 100 degrees off axis, and both transmitter sites at two-and-a-half miles from the studio, and you're running the 6000 at more than five watts, that will kill the StarLink signal, guaranteed. Run no more than two watts out of the 6000 when there's a StarLink on the same frequency. Better yet, run StarLinks on both legs of the STL, if you can. That's where we are trying to go.

Fourth, don't try to run your STL at 32 kB/second sampling rate into an Intraplex in synchronous mode and into the transmitter unless you want your audio to sound like a bad transistor radio speaker with your hand over it. The Intraplex demands a 44.1 kB/second input into it, even though for synchronous operation its throughput is 32 kB/second. Go figure. So, if you're running a 6000 series STL with digital throughput, you're going to have to have some sort of standards converter between it and the Intraplex, such as a Z-Sys unit.

Fifth: The Marti STL-15C transmitter is set up to operate with a digital input set up for 32 kB/second, two channel. Period. It won't work with 44.1 kB, two channel, nor will it work with 32 kB/second, four-channel digital input. The modulator circuits in the Marti will simply mutilate the digital information and the Moseley 6000D receive decoder won't accept it. You're going to have to bypass the Marti modulator circuits entirely, by connecting the 6000E feeding encoder directly to the transmitter modulator. There is a level adjustment in the 6000E box to facilitate proper modulation level, but you'd better have a spectrum analyzer on hand in order to get the proper bandwidth on transmitted signal. While you're at it, check your Marti's spectral

performance while operating at low power. Some transmitters produce very noticeable spurious outputs when the power is turned down too low. This isn't a problem with the Moseley 6010 box, but may be with other brands of STL transmitters.

I'd have more for you this month, but finding the right folks, or any folks, to verify information during National Goof-Off Fortnight (December 20-January 4) is a big problem. More next month. Blessings!

The Portland Report

By

John White, CBRE
Chief Engineer, CBC-Portland

It's the day after Christmas as I pick up the keyboard and put digitized electrons to magnetic domain media to write this, my contribution for the New Year's newsletter to start a brand new year. This Christmas season was interesting as La Niña nearly brought snow to Portland.

Continuing the theme from last month, I wanted to comment a bit more about HD-R. I tend to be critical of bias from our "mainstream" news media (TV networks and newspapers), often the result of lack of context and detail. I would like to add some context and detail to the discussion about the new HD-R broadcasts in the AM radio band. That context starts with history.

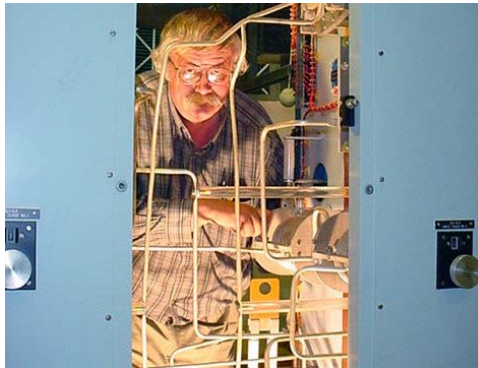
In the very early days, broadcast radio stations often followed the engineers as they moved around the country. An excellent example, KFXD, was originally licensed to Logan, Utah in 1922. It moved to Jerome, Idaho in 1926 and then to Nampa, Idaho in 1929. The reference here is to KFXD on 580 kHz. Recently, KFXD and KIDO (630) traded call signs. More about KFXD later.

From the 1930s through the end of WWII and into the early 1950s, radio was principally national in character with programming provided to local radio stations. The Mutual, CBS, NBC, Red and Blue networks provided the bulk of the programming country wide. Connected by 7.5 kHz and 5 kHz equalized copper telephone lines, the latest radio soaps, mystery and comedy shows from New York were broadcast across the country. AP and UPI, the major news wire services, served both radio and local newspapers. In many rural parts of the country, the national class I-A channel stations,

WLW, WLS, KFI, WSB and others, provided an essential night time connection when the local station could not be heard. Just prior to WWII, WLW operated super power with 500,000 watts. That transmitter was maintained on ready standby throughout WWII in case it was needed during the war.

In the mid-50s, the radio world changed when "radio with pictures" made its debut. By May 1955, KLIX-TV, later KMTV, was on the air and the TV revolution in rural Twin Falls, Idaho was underway. The local class IV station, KEEP, changed format to become the local Top 40 station. KLIX radio became the local news station and the voice of the Twin Falls Idaho baseball farm team, the Cowboys. KTFI-AM held on for awhile as the NBC network and classics big band music station while continuing to lose market share. The expectation was that KTFI-FM would soon be off the air.

The 50s and 60s were the days of *local* radio programming, frequently music. The seven-station, no-newspaper ownership FCC rule was in effect. The largest broadcasters owned a maximum of seven stations. Radio was "losing" the competition to television. Our family floor model AM-FM radio with the old FM broadcast band at 42 to 50 MHz lost its prominence in the living room and was moved to my room. Equipped with a real wire loop antenna, I listened at night to KFI and its local Los Angeles talk programming. Later, while driving to and from collage, I listened to KOMA, Top 40 and Wolfman Jack on XERF and XERB. Both Top 40 formats were locally produced in Oklahoma City and Del Rio, Texas but with a signal that reached much of the United States.



It turns out that KFXD is an excellent example of post WWII AM radio days. In 1948, KFXD moved to a new facility and frequency at 580 kHz on the low end of the dial. The move followed a contested application with a late-filed competing application in Montana and the decision based on protection of KMJ 580 in Fresno, California. The transmitter, installed in 1948, was a Gates BC-5B modified with 2 833s in the final for 1 kW and two 300 foot Blaw-Knox self-supporting towers. In the very early 1950s, two additional guyed towers were added and the 5B transmitter was upgraded to the original 5 KW configuration.

I mention this for two reasons. The protection of KMJ was/is very tight. With four towers and 5 kW, the KMJ monitor point limit is 7.2 mV/m at 2.1 miles from the center of the KFXD array. Normally I was able to keep that monitor point around 5 mV (for a shave-tail college kid engineer, that was a bit of a trick for a system with mixed self-supporting and guyed towers... ever tried to stack BBs?). I could easily listen to KMJ when less than 4 miles from KFXD. At the same time KFXD could be heard in Portland, Oregon.

In those days, radio stations were required to do an audio proof-of-performance yearly. Frequency response, audio harmonic distortion and noise were measured at several different modulation levels from the microphone input to the demodulated RF output. (For AM, you had to be good from 50 CPS – yes, it was cycles-per-second in those days – to 7,500 CPS at 95% modulation.) One year during proof, I tested the full audio bandwidth of the KFXD RCA console, Gates Sta-Level limiter, home-built limiter and the BC-5B transmitter. I was pleased to find the station easily did 20 CPS to 14,500 CPS at 95% modulation.

KFXD was fairly typical of off-the-shelf equipment for the day. It's very clear that the RCA, Collins, and Gates mixing consoles and transmitters delivered very high quality audio to the listener's receiver.

It's worth noting that the 1940s Western Electric grid-modulated Doherty (and the later Continental Electronics Dohertys) were even better for frequency response. KLIX radio used a 1930s vintage Western Electric mixing console that was flat from 20 Hz to 20 kHz. Some AM stations with composite transmitters were flat from 20 CPS to 20,000 CPS. Outside of a few specific combinations of stations, there were no real limits to AM audio bandwidth. So much for the *low-fi* criticism of AM radio.

Like many engineers, I had my fair share of exposure as an "on air personality." While at KFXD,

I had an on-air show that was a departure from the typical Top 40 format. During that show, I mixed in new album cuts with the latest Billboard hits list. As the promotional records came in, the hit groups – Beatles, Rolling Stones, Paul Revere and the Raiders – would be pulled out. I would go through the albums and singles in the to-be-ignored pile, occasionally finding a gem which I would use on the air. Looking back now, what I was doing was the forerunner to the album music format to come later. At the time, a lot of the stuff I played was obscure, only later to become popular. Much to the consternation of our program director, those segments had the highest ratings in the Boise market, so the albums stayed on the air.

KFXD was off for maintenance on Monday nights, so I often listened to KVI (570-Seattle) while I worked. One night, I noticed that KVI was playing much of the same stuff that I was pulling out. A few days after I found something new, it would show up on KVI. As a test, I started playing new stuff without saying the group or title. Then, sometime later, I would announce the group. Bam! Within days, KVI would be playing it. I can't prove it, but I do believe that someone at KVI was listing to KFXD. A not uncommon practice in those days, it does suggest market to market influence in those days of AM radio.

In the mid- through late-1960s, I saw the AM radio band change again. In Boise, Idaho in 1968, KBOI moved from 950 at 5 kW to 670 at 50 kW as the national clear channel frequencies were opened up. KATN in Boise moved from 1010 with 1kW day to 950 with 5 kW, and KXL in Portland at 750 kHz went from 50 kW day only to 50 kW-day/25 kW directional night. All across the country, new and expanded-coverage stations came on the air.

By the late 1970s, change in the AM band was in the wind again. FM was starting to grow. Cheap AM transistor radios were on the market (cheap in cost and very poor audio quality). Local radio station operating costs were rising and revenues were declining. Satellite technology was bringing instant video from around the world.

Not all of the challenges came from technology or competition. KISN in Portland was taken off the air for an equal time violation for not having the same number of Democratic and Republican news stories. Although KISN eventually won the case, the station never again regained its ratings position.

By the 1980s, AM radio was changing again as many stations moved toward talk and call-in formats. By the late 80s, the combination of satellite

distribution, the elimination of the equal time rules and the advent of 800 numbers allowed syndication to take talk, religious and music programming national. Radio had come full circle, from national to local and back again to national programming.

And still the change in AM radio was not finished.

In the 1990s, (analog) AM Stereo was introduced. For years, AM had suffered with an “ancient modulation” image of low-quality mono radio. AM Stereo was an attempt to change that image and give AM a competitive upgrade. Most engineers in AM broadcasting believe analog stereo was an excellent technical achievement. Unfortunately, it was one that got caught up in what is best described as emotional and political discussion that had little to do with technical issues. Analog stereo was doomed to failure when the sniping and turmoil caused receiver manufacturers to drop support.

Analog AM Stereo also brought the first universal AM bandwidth limitations. AM was now limited to 10 kHz bandwidth. I want to stress this point. It’s only in the last 18 years that AM broadcasters limited the sideband content of their broadcasts.

That brings us to the present and the introduction of HD-R. When thinking about the “digital revolution,” I like to recall some important historical points.

- The entire history of AM broadcasting is filled with change, on average every 10 to 15 years. In some cases, major change.
- The days of contiguous US coverage by a few AM stations are gone and have been gone for nearly 50 years.
- Many of the changes were driven by technology. TV and satellite technology are just two examples.
- Other changes came from competition and factors having nothing to do with broadcast technology.
- Relaxation of regulatory control of programming content promoted the growth of AM talk radio.
- Throughout most of the history of AM broadcasting, the idea of bandwidth limit protections never existed and in fact is a very new idea.

I suspect much of the resistance to HD-R is a very human characteristic – fear and resistance to change. Change is hard to accept, but as I have shown, change is at the very core of AM broadcasting.

As we move forward, the goal should be to better serve our local audiences with programming and technology that meets the needs of the audience we serve.

Ed Dulaney is on vacation. His Rocky Mountain “Hi” column will return next month.

SBE IRLP Hamnet

Those Amateur Radio operators in our ranks are invited to check in to the SBE IRLP Hamnet on the first and third Saturdays of each month at noon Central. 2-meter or 70 cm IRLP nodes exist in most CBC markets. More information on the IRLP is available at <http://www.irlp.net>. The SBE net is on the Great Lakes Reflector, which is node 9615.

For more info on the SBE IRLP Hamnet, go to:

www.qsl.net/ke0vh/SBEhamnet.htm

You can claim ½ recertification credit for checking in!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

A Techie's New Year's Resolution

Every year around this time, we tend to hear more and more about New Year's Resolutions, everything from spending more time with family to getting healthy. In fact, we can expect to see more ads for exercise equipment and diet plans during this month than any other month of the year.

Although fitness and family should be on your list for 2008, save yourself some frustration and add your computer's health to that list. Actually, these tasks should be completed on a regular basis. But I make it a point of taking care of these items in January of each year for those friends and families who may fire up their computer only once or twice a week.



1. Anti Virus Renewal

For some, keeping up on their antivirus subscription is at the bottom of the list if it appears on the list at all. Quite honestly, I don't keep my subscription renewal date memorized either. For that reason, I typically renew my anti-virus software at the beginning of each year. In most cases, renewing early also makes me eligible for a discount. I know I'm going to need the software, so why not take care of it and be done with it?

2. Anti-Spyware Renewal and Updates

The same goes for anti-spyware software that has become so important in recent years. Apart from renewing, I always make sure any updates have been downloaded and installed. Once those items are complete, a full scan of the computer is in order. During my yearly "friends and family" computer checks, I often encounter six months or more of updates waiting to be installed along with close to year since their last scan. Just a couple of months back, I was working on a friend's computer that had gone four years

without a full spyware scan and it definitely contained a sizable roster of who's who in the spyware world. Needless to say, that computer is running much faster after a full scan and clean.

3. Windows Updates

Although most users have set their system up to download and install windows updates automatically, I have come across some machines that were still running Windows XP SP1. Make sure to either check <http://www.update.microsoft.com> or go through Start > Control Panel > Windows Update (on the left). Either way, you can ensure that your machine's operating system is up to date.

4. Disk Cleanup

The beginning of the year can be a great time to clear out some of the "garbage" that's on your machine. Anything from files that you haven't accessed in several years to temporary files located on the hard drive. Depending on how much data you have on your computer, this could potentially be a time consuming exercise. But it will be well worth it in the end. Also make sure to clear out any temporary files that may have accumulated on your hard drive. This can easily be taken care of through Start > All Programs > Accessories > System Tools > Disk Cleanup. Easy enough?

5. Disk Defrag

Another often ignored utility located in the system tools menu is the Disk Defragmenter. Running this program will organize the data on your hard drive, making it much easier and quicker for your computer to find. Although regardless of your data organizational skills, defragging the drive won't help you find that elusive file you've been seeking during the last few months.

6. Clear the Cache

Pronounced “cash” (as in the thing you have less of as a result of Christmas), the computer cache stores data relating to internet browsing. This area can become full of files that are no longer necessary. If you are using Internet Explorer, you can clear this area by going to Tools > Internet Options. Then click on “Delete” under the Browsing History section of the menu window. For those using Firefox, you can simply use ctrl+shift+del to clear the cookies.

7. File Backup

If you’re like me, you backup the important data on your machine each month or as often as every other week. For others, data back-up is something that is taken care of infrequently or never at all. Take this opportunity to back-up your important data to a CD or DVD. Better yet, invest in an external hard drive and a good backup software package. You can then schedule regular backups and let your computer do the work.

8. Email Backup and Cleanup

Your email client is another area that can quickly accumulate cyber junk. Take this time to eliminate any messages older than two years or backup messages you feel are important. You should also check your junk email folder and any spam folders you may have. Once those areas are

clear as well, you should clear out your deleted items folder.

9. Create New Passwords

Although this item isn’t as important as the others on my list, setting up new passwords for the New Year can prevent security issues posed by using the same passwords repeatedly. Remember to note your new password(s)... in a safe place of course.

10. A Clean Start

One task that I’ve only completed a few times in the past is clearing off the computer and starting from scratch. If you have plenty of time on your hands and you have no idea how to spend it, this could be the job for you. After clearing your data and reinstalling your operating system via your OS disk, you will need to reinstall all of the software you use on a regular basis. Although this could be a great opportunity to get rid of those programs you haven’t used in quite some time. Make sure you first back-up all of your important data and emails prior to starting. Once they’re gone, they are gone.

I hope many of these areas are addressed on a regular basis. If not, this is a great time to take care of them.

Happy New Year! ...until next month!

The Local Oscillator
Jan 2008

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

KCBC • Riverbank - San Francisco, CA
770 kHz, 50 kW-D/1 kW-N, DA-1

KJSL • St. Louis, MO
630 kHz, 5 kW-U, DA-2

KKPZ • Portland, OR
1330 kHz, 5 kW-U, DA-1

KLZ • Denver, CO
560 kHz, 5 kW-U, DA-1

KLDC • Brighton - Denver, CO
1220 kHz, 660 W-D/11 W-N, ND

KLTT • Commerce City - Denver, CO
670 kHz, 50 kW-D/1.4 kW-N, DA-2

KLVZ • Denver, CO
810 kHz, 2.2 kW-D/430 W-N, DA-2

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

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

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

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

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

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

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

WDCD • Albany, NY
1540 kHz, 50 kW-U, DA

WPTR • Clifton Park - Albany, NY
96.7 MHz, 4.7 kW/100m AAT

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

WRCI • Webster - Rochester, NY
102.7 MHz, 6 kW/100m 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

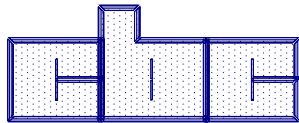
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND

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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