The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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NAB Observations

It was good to be back in Las Vegas at the NAB spring convention and Broadcasting Engineering Conference. I had to sit out last year because I was on the mend from a couple of back surgeries and not up to the pace or rigors of the travel or the show itself.

Being away from the show for a year, I got a two-year perspective rather than the usual year-to-year, and it was telling. I found the show to be well attended (NAB reported 98,000 or thereabouts, and I think I bumped elbows with 96,000 of them). That says something about the way broadcast owners view the state of our industry ï companies donôt waste money sending their employees to the NAB convention unless they believe it has something to offer. I can remember recent years when it seemed like vendors outnumbered attendees. Not so this year. Exhibit floor traffic was brisk and it was difficult at times to get face time with the more popular vendors and manufacturers. I see that as a very good sign.

The Broadcast Engineering Conference was outstanding this year. In particular, a Tuesday morning session that dealt with various AM antenna modeling issues, antenna optimization, the WWVA disaster recovery effort and the KRKO tower project and subsequent terrorist attack was riveting, with attendees staying glued to their seats for the entire three-hour block. I learned a great deal and enjoyed a time of fellowship with friends and acquaintances that I get to see only once or twice a year.

In terms of new products, there were a few that caught my eye. The Omnia.11 was a show stealer in my view. Evidently some others agreed ï it won Cool Stuff, Pick Hit and techINK awards. It impressed me so much that we purchased four, one each for WSRB, WPWX, WMUZ and WDJC-FM, and we may purchase more going forward. More on the .11 later.

Wheatstone was showing its new AurAura processor, which is a direct competitor to the Omnia.11. We have an AirAura running in Birmingham and we love it.

Nautel was showing its three main transmitter lines: the NX AM series; the NV FM series and the new VS low-power FM series that has a great set of unique features for remote and satellite/translator installations. Each of these had new features this year, including the much talked about asymmetrical FM digital carrier capability (to reduce interference to adjacent-channel stations in certain situations).

Tieline Technology was showing its usual great line of codecs, but it had an innovative new product that caught my eye: an iPhone app (ñReport-IT Liveò) that is a 15 kHz remote codec. To go with it, Tieline has a piece of hardware, a docking station essentially, that has a mic and headphone jack. This new setup represents, in my view, the ultimate in anywhere/anytime remote broadcast capability, and since the biggest investment is in the iPhone itself, the cost is very reasonable. Of course the Report-IT Live only talks to other Tieline codecs, but they have some very reasonably-priced options from well under $3,000. The only thing holding me back from jumping on this product for our remote-intensive Chicago operation is that it operates over the 3G backbone, and that has been a real bottleneck for us at large events. Just try to hit a webpage on your iPhone from a Rockies game sometimeé with everyone texting, sending MMS messages and videos, the bandwidth gets used up in a hurry.

I spent a good bit of time with the folks at ERI at the show. We had them develop a new directional pattern for us for WPWX, and at the show we were going back and forth with their folks on the antenna range putting the finishing touches on. The new antenna will be a six-bay MPX-series with half-wave spacing. Believe it or not, this antenna weighs less and has less windloading than the existing four-

section H&V directional antenna. More on that later.

There were lots of other great products, too many to mention them all, including great new products and innovations from our friends at Wheatstone, Kintronics and others. To me, this was clear evidence that people believe in the future of broadcast radio. They are investing in product development with the belief that there will be a market for those products and services going forward. And radio station owners, engineers and programmers are interested, further evidence of an optimistic outlook.

Iôm excited about what the future holds for our industry. While we canôt ignore the ñnew mediaò and demographic shifts to alternative sources of programming, radio and its content are still king. I believe the best is yet to come.

Projects

As I noted above, we have purchased several new Omnia.11 audio processors for key FM stations in our company. We installed the first unit at WPWX a couple of months ago. Frank Foti came to the station and put the ñmagic touchò on it. The result: WPWX is reportedly the best-sounding station of its genre on the Chicago radio dial. It is certainly the loudest, thanks to some new Foti wizardry within the .11. The units we have received were shipped with pre-release firmware, meaning that some of the features (including the HD processing path) were not functional yet, but we have been assured that the full-feature production firmware will be on its way to us shortly. When we get it, we can put the .11 in the HD-1 audio chain, and we can begin to experiment with single-sideband stereo subcarrier operation, which is claimed to noticeably reduce multipath.

We filed an application with the FCC for the new WPWX directional antenna in mid-April and are hoping for a grant early enough this year to get the antenna ordered, delivered and installed in 2011. The old antenna went up in 1986 and, as I noted, is an ERI design employing horizontal and vertical elements. The new antenna is circularly polarized, which will present a big improvement, and with half-wave spacing the pattern is much more controllable, allowing the range engineers to open the pattern up quickly on either side of the single required null. This will put a lot more signal into downtown Chicago, the northwest and the southwest.

Later in this issue, Amanda will recount her adventures with the ND-50 lightning protection circuit at KLTT. We talked a bit about this last month, and I harped in particular on the documentation issue. The new circuit is documented and now right in the three-ring binder containing the ND-50 schematics, right with the remote interface board schematic (which is the board the circuit ties into). Thanks to Ed Dulaney, who still reads *The Local Oscillator* from his new digs in North Texas, for pointing us to the location of the original circuit schematic.

Iôm pressing hard to wrap up some moment-method proofs around the company. During April, Amanda and I got all the measurements done on the KLTT array. I created and calibrated the models and we got the model operating parameters dialed in. The application is now on its way to the FCC (just in advance of the expiration of the STA), and we expect a grant in a few weeks. With this filing, we have licensed all of our Denver market directional arrays pursuant to the new modeling rules. Next on the list is WRDT in the Detroit market. Joe Huk will be working with local consulting engineer Russ Harbaugh to do the measurements. Iôll run the models and do the application and weôll check that market off our modeling list.

Finally, the KBRT mainland transmitter site development project continues. While we await the grant of the FCC construction permit, we continue to pursue the county use permit, an infinitely more complex and difficult process. Our hope remains to have a use permit in hand sometime this summer, allowing us to move forward with the construction.

Birmingham Disaster

You would have to be living in a cave to be unaware of the tornado outbreak throughout the South the week of April 24. I watched The Weather Channel in awe as it showed a view from the Channel 13 camera on top of Red Mountain in Birmingham, just a couple of miles northeast of our studios, tracking a mile-wide tornado as it moved from west to east across the north end of town. I found myself thinking, ñWhat of ours is up that wayé the WXJC(AM) transmitter site, Stephenôs houseé ò Along with a lot of other folks, I prayed that the monster storm would miss all our people and facilities. God is good ï we sustained no direct damage from the storm.

Stephen related an account to me of waking up before 6:00 AM the morning of the big storm to the freight train sound of a tornado. He and Sandy, who was recovering from surgery and unable to move very fast, just huddled and waited until it passed. Their house was still standing, minus a few shingles; their neighbors werenôt so fortunate, suffering a total loss.

Since that record-breaking tornado outbreak,

Stephen, Todd and Jimmy have been hustling to keep our stations on the air. The issue has been utility power, or rather the lack thereof. The power was out on Red Mountain in Birmingham (the WDJC-FM site) until the afternoon of Sunday, May 1. As of this writing, the power is still out at our Cullman site (WYDE-FM) and is forecast to be out for a long time to come. The issue there is not just power line damage but powerplant damage ï the town of Cullman was destroyed by one of the tornados and evidently the Alabama Power generating station along with it. Stephen and his crew have been shuttling fuel to the sites in 55-gallon drums and manually pumping it into the generator tanks.

The final chapter on those storms, including the hundreds of lives lost and countless amount of property damage (the tornadoôs path across Tuscaloosa and Birmingham can be clearly seen from space), wonôt be written for a long time to come. As this issue of *The Local Oscillator* goes to press, Stephen, Todd and Jimmy are still shuttling fuel and looking for ways to nurse the WYDE-FM generator along. For obvious reasons, youôll have to wait for the next issue to read Stephenôs account of the storms and aftermath. Keep our Birmingham folks and all the good people in the affected areas in your prayers.

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

Hello to all from Western New York!

From time to time we all seem to wander off the engineering path in these pages and discuss topics that have equal importance to broadcast engineers. As humans, it is in our nature to feel that what we do for our stations is important, and more importantly, what our constituents think about our abilities and standing among the ranks of fellow engineers is of greater importance.

It all comes down to integrity, how well you adhere to moral and ethical principals, honesty, and soundness of moral character. My dad taught me years ago that people are judged by their actions, verbal beliefs and association with their surroundings. Integrity is easily defined, but obtaining integrity and holding on to it can be, at times, an almost impossible task.

I bring this subject up because I firmly believe that everyone is born with it; how you live your life determines how deeply your integrity lies. A recent chain of events in the life of a friend has prompted me to stop and look at what I believe constitutes integrity. This friend (whom I will not identify here) was leading a secret life, a complete turn around from the lifestyle, beliefs and teachings he presented. Even those closest to him, had no idea as to the extent that he had gone to ñcover upò his alternative lifestyle. Once the truth was out, his integrity went down the drain like soap bubbles in the kitchen sink.

There are several different ways we can interpret integrity. Aside from the above definition, which relates to personal (moral) integrity, there is the state of being whole, entire or undiminished; and thirdly, a sound, unimpaired or perfect condition. Of the three, moral integrity is the hardest to maintain, therefore when decisions are made that go against our moral integrity, the end result is usually self-destructive or aggressive behavior, which bear consequences such as addiction, job loss, depression, and loss of family and self respect.

People with integrity are successful because they are in control of their thoughts and feelings, and negate those thoughts and feelings which result in a negative outcome. Taking responsibility for any negative situation and turning it into a productive, positive action is a sign of integrity. People with integrity do what they say they will do, they create plans, and follow through with enthusiasm. According to Michael OôGrady, a well known teacher and self-motivation speaker, there are three useful steps to

living everyday with integrity.

1. Create a mission statement ï Start by writing your beliefs and core values down on paper. In your personal mission statement, include three promises that you will make to yourself that are in line with your beliefs.
2. Identify tour goals- Follow your mission statement with a goal that you want to achieve in the immediate future.
3. Take action ï do not spend a lot of time thinking and planning. After you have chosen a goal, jump in and get started, but remain focused on the end result. Keeping in mind your beliefs, values, mission and goals will help you build integrity in your everyday life.

Start each and every day with positive thoughts that are meaningful and productive. We are all truly blessed in the fact that we have a job to go to, a roof over our head, and a Creator that loves us. Be true to Him and yourself. Negativity and complaints can manifest into more serious situations that can lead to personal moral disaster. Surround yourself with positive thoughts and positive people, and look for ways to improve the actions and thoughts of those around you; by doing so, you are helping your friends and co-workers to overcome any obstacle they encounter, by creating a plan and implementing it with a positive attitude, and positive outcome.

C-Band Woes

In Buffalo, we are still trying to figure out what can be done to improve our C- band satellite reception. Our current dish is a Patriot 3.8 meter dish which was installed almost eight years ago on the roof of the WDCX studios. We have never had a period of time go by without audio drops or glitches in our teaching programs. When AMB-OS was added several years ago, that platform enabled the receiver to compare the original program to the downloaded version, and if inconsistencies were found, i.e. missing data, the AMB-OS receiver would download that missing data via the Internet and replace it on the hard drive of the unit.

We air several live shows weekly that have been getting progressively worse in the number of audio dropouts. Trying to identify the cause of these dropouts has been everything but successful. I have replaced the coax, connectors, and splitter that connect the receiver to the dish, along with the PLL LNB. I have even added attenuation to the receivers input, in case the received signal was swamping the front end of the receiver. Recently, the dishôs alignment was checked with a spectrum analyzer to insure that we were in perfect alignment with the satellite, and only a slight adjustment needed to be made to the dish to achieve maximum signal level. Still, with all of the above procedures being done, we still have the audio dropouts, as consistent as ever before.

In talking with the sales engineers at Dawnco, they tell me that the quoted specs on the Patriot antennas were not extremely accurate, and that the gain of this antenna is actually almost 1-½ dB below specs! This would explain why, when I tried to install a Wi-max filter on the end of the LNB, we lost ALL signal into the receiver. The Wi-max filter has an injection loss of 0.5 dB, which should not make a whole lot of difference in signal level, except if the level is marginal at best.

At this point, we are looking into the possibility of replacing this dish with a higher gain spun (not multi-paneled) dish. The only requirement we would have is to find a dish that would work with our current Baird non-penetrating roof mount. The mounting kit is the bulk of the cost in setting up a roof mount dish, and if we could eliminate that expense, I could better justify just the cost of the dish and LNB alone.

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

Last month I traveled to Las Vegas to the NAB spring convention. At the show I visited the Nautel to see a presentation on DRM (Digital Radio Mondiale), learned about how to setup my Telos Zephyr. Then I found out how to send text messages directly from my NexGen automation so that they stream on multiple data channels, and received a chance to listen to the new Omnia.

DRM PLUS +

At the Nautel booth, DRM made a presentation on their new enhancement to their technology. Historically, DRM has proven to be a viable digital technology with shortwave transmissions. My understanding is that it is very robust during times when multi-path is present during ionospheric propagation conditions or when the signal skips off the upper atmosphere. AM reception is typically distorted at times during these conditions but with digital transmissions, large bit errors can cause loss of transmission. DRM has proven to work well under these conditions.

Now, with DRM PLUS+, the transmission system is now expanded to work in the FM broadcast band. My impression from the demo is that the DRM PLUS+ system possesses a large cache of data features.

Telos Zephyr IP

In March, we purchased a new Telos Zephyr IP system. Prior to NAB, I had not had a chance to really set up and use the unit. Therefore, going the NAB gave me the opportunity to explore system with the manufacturer. The Telos Zephyr IP utilizes their companyôs directory server. This server allows the user to connect their studio and remote unit together through the Internet. This is particularly useful when dealing with a LAN where you may not know or have a specific port open on the router to the Internet. The server negotiates the connections of both ends of the path and seamlessly makes the connection. You can create your own host names for your Zephyr units and a group. The group could be considered your stations call letters. My understanding is that the unit can use the built in codec or even an MP3 codec.

After NAB, I brought the remote unit to my home and used the built in codec. The unit was very robust and sounded great. I left it connected for a complete day and noticed no drop outs. I canôt wait

to try the unit for our next remotes in June!

RCS NexGen

Prior to NAB, I had a discussion with our afternoon show host, Robin Sullivan. She indicated she wanted to provide our listeners the prayer of the week in a text form. I told her that I had to consult with RCS. Again, I thought that NAB was a great place to inquire. When I got to their booth I explained what I wanted to do. I was told the best way to implement the text was to use the ñExport Commentò by right clicking in the element latter area in NexGen. Then a macro could be use to fire the lines of text. I have yet to try it, but this will sure provide our listeners with both and aural and visual experience of Robinôs show.

Omnia.11

I had an opportunity to listen to the Omnia.11 at NAB. I did notice added loudness and a very deep low end frequency response. In some cases, it seemed to be a bit excessive with the program material they were playing. When I got back to Detroit, I found out that one of the competitors in town was running an Omnia.11. It seems that folks are running these processors to the

limit. What I am finding is that the audio sounds good on receivers that can provide a wide frequency response with a lot of amplifier headroom. However, on my mid-line Ford radio, the competitorôs station sounds really distorted compared to others. From my experience, you need to listen to many radio receivers to see how the processing affects each of them, and then implement processor settings that are a best fit for all. Yes, it is a compromise.

Just the other day, to my surprise, it was Christmas. An Omnia.11 appeared on my doorstep. Now I get a chance to put the processor to the test. I know it will make us loud, but we will make sure it is clean!

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. Best regards

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News From The South

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

Thanks to those of you who prayed for Sandy to have a speedy recovery from her surgery this past month. Sheôs doing quite well, thank the Lord!

New Loops for Tarrant

In the, ñHas It Really Been A Year?ò department, we finished modeling and repairing the 850 AM directional array about this time last year. We eliminated the old toroids and switched to sample loops, but have since realized that theyôre marginal for our nighttime pattern. We get more than adequate sample voltage on the 50,000 watt day pattern, but the 1,000 watt night pattern is right at the PI 1900ôs lower limit. After consulting with Potomac Instruments and Cris, we decided that the most cost-effective fix was simply to double the size of each loop. Weôll be pushing the upper limit on the day pattern, but itôll work.

The loops that we installed last year were made of heavy galvanized steel; since we were making them considerably longer, we opted to go with aluminum to save weight. I ordered some thick ñLò shaped stock from Grainger and we cut them to size (figure 1).

The steel loops had been created by notching at each bend, then tack-welding for strength. This 1/4ö thick 6061 aluminum wouldnôt bend without cracking, so I needed a way to join them after cutting. Solder-It (www.solder-it.com) makes a zinc-

Figure 1 - Todd cutting the aluminum to precise lengths with a cut-off blade.

based solder that Iôve used in the past. It will bond aluminum just fine, but at $8 per tiny tube, it gets very expensive when doing a larger job. Even worse, the syringes clogé the flux and metal particles separate inside the tube, meaning that you have to insert a pin and stir everything from time to time. I wanted something better and less expensive.

As I mentioned last time, Tin Man Enterprises (www.tinmanenterprises.net) offers a nice aluminum brazing rod with a flux core. Their website has some videos of it being used. I ordered a pound of the rods for about $40 with shipping. These things worked like a champ with our oxygen-acetylene torch. In fact, Todd, Jimmy and I were all surprised at how easy it was.

If you want to try it, follow these simple steps: first, clean and rough up the joint with some rubbing alcohol and a wire brush. Wipe away the excess, then preheat the joined area by waving the torch around underneath the aluminum. Once the metal is nice and hot, lay the rod in the crack and apply the torch from the top. A finished joint is shown in figure 2. Itôs *strong*, too. If you do even a half-decent job, you wonôt be pulling it apart with your hands, I assure you!

All that remains is to drill the holes for the N connectors and to brace up the angles with some UHMW insulating rod. Hopefully (weather permitting), Iôll be able to report on the finished project next month.

Figure 2 - A nice, smoothly-brazed joint on this finished loop.

A Bulwark Against the Weather

We included a picture last time of erosion and flooding in front of the studio/office building here at 120 Summit Parkway. We hired Sunbelt Builders to lengthen the retaining wall in front of the

Figure 3 - Extended retaining wall to prevent flooding.

bottom doorway to help guide the water around and away. Danny Dalton, he of long experience with our company, brought in some juniper plants and fill dirt to keep the hill from eroding. Weôve already had one serious rain event since the work was completed and another is on the way. Thus far, it seems to be working.

Is It Just Me ...

... or are prices really going up now? Iôll be honest with you: if I was on a fixed income and/or a tight budget, Iôd be nervous. Iôm not just talking about the price of gas, either. Prices on everything from building materials to bread continue to creep

steadily upwards.

I don't claim to be an economist and I'm certainly not an expert. But those who are have been warning for some time that if the government continues to borrow and print money, inflation is the inevitable result. The dollar is worth less overseas, which means that we need more of them to buy the same barrels of oil, or sheets of plywood, or whatever. (Remember, very few things are still manufactured in the United States nowadays.)

What is astonishing to me is that this has become a political issue, with those (like me) who argue for fiscal sanity being called every name in the book. I frequent a couple of different discussion groups online, and the arguments against fiscal sanity have morphed in the past two years. First, it was, "the Republicans spent way too much, so you have no right to point fingers." (We'll ignore what my grandmother what have said to that: "two wrongs don't make a right.")

Now that the current administration has outspent all others (no mean feat, that), they've moved to a different argument: "We need to tax the rich more." Maybe, maybe not. But even if we tax the wealthy at a 100% rate, it still won't cover what we're spending. Funny how they never mention that. Nor do they mention the fact that if we go after the wealthy with both barrels, they'll simply leave and move somewhere else. (Don't say it can't or won't happen; John Lennon, just to name one, specially stated in several interviews that he moved to the United States for that very reason. He didn't want to pay the ridiculously confiscatory tax rates that, at the time, were being imposed on the wealthy in the United Kingdom.)

You can already see what's coming next, too: W*ell ... you're just not very compassionate.* That's wrong on several levels. First, it just assumes and takes as granted that *only the government* can help the less fortunate; that if we who produce and earn a living wage don't willingly allow the government to confiscate our income to help others, they will inevitably suffer.

But suppose we grant that. The illustration that comes to my mind is that of a young couple with great credit, filled with compassion for their less-fortunate neighbors. They feel it morally wrong to just stand by and do nothing, so they max out their credit cards helping them. This couple then obtains a second mortgage. Then a third mortgage. Most of their money goes to helping the less fortunate, which is a laudable goal, but eventually, they go bankrupt. It's the same for a municipality, or a state ... or a nation.

As for the price of gas, there's our energy policy. One reason why the Deepwater Horizon oil spill (remember that? we sure do here in the Gulf region, even though it no longer makes the daily news!) was so bad was because that well was several thousand feet underwater. When the blow out occurred, the people trying to patch it weren't just fighting against a very aggressive oil flow, they had to contend with terrible working conditions. At that depth, the pressure will crush anything except a specially-reinforced, remotely-controlled submersible.

Now, I'm just an old buck engineer, but it seems to me that we could drill in Alaska with a whole lot less risk. Even if a Deepwater Horizon-style blowout should occur, it would be an order of magnitude easier to contain and clean up. If nothing else, we could require that a retaining wall be built around each well, with equipment on site to handle any emergencies. That would go a long way toward energy independence for the USA, and given that the price of oil is one reason for the inflation that we're seeing, it baffles me that Washington isn't at least considering it. The Democrats won't propose anything like this because their core constituencies would never stand for it, and the Republicans avoid the issue because they know that they'll be crucified in the press.

I don't know what the answer is, but until we can elect some people ï and for the record, I don't care what party label they wear ï who genuinely want to see America thrive and remain the greatest nation in human history, we will continue our slow decline.

Therefore, I close again with (for this and many other reasons) my earnest request: pray for this nation. Until next time!

Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island!

Itôs that time of year again, weeds, weeds and more weeds! We are performing our annual brush clearance and cleanup, and as usual, this has me very busy for a good solid month or two. Though we do brush clearance throughout the year, it is only around the doorways, gates, roads and other access ways. This job entails mowing most of our tower field and major clearance around all buildings.

Most of what is done is done by hand due to the fact that we have ice plant around our buildings as a fire break. This job also entails lots of cleanup due to the fact that the winds tend to make quite a mess during the winter and fall seasons, so we must prepare for the summer tourists to view our plant as well as the many projects and repairs that I perform outdoors each summer.

This year I am also performing maintenance on some of our indoor equipment, mostly things that keep us on the air through the awful electrical power outages we experience almost every week here and the remote control equipment that gives us access to our transmitter and other devices. Though this sounds like routine maintenance, some of this can get tricky here due to the fact that our power outages are so severe they often take down even the best of UPS units and tend to cause our transmitter to require a manual reset to go back on the air. I am working on making even this manual reset procedure so that it can be done remotely, as I am preparing to be on the mainland more and more as we move forward with our new Black Star Canyon site there.

It is always nice to have good friends nearby who are available and capable of filling in for you in an emergency. This was the case a couple weeks ago. I had just pulled into the Long Beach port on the mainland only to receive a call that we had gone off the air. As I called our remote control, I found that we did not have power, and upon further investigation, I realized that though we had single phase to our plant, we did not have three-phase power. As such, I could not restart our transmitter.

Glen, my usual back-up at the plant when I am away, works for the Catalina Cable TV Company, so I gave him a call only to find out that they had also been hit pretty hard, and since he has to get them situated first, he was not able to make it to our plant until later that evening.

I jumped on the next boat returning to the island, and after some investigating and a chat with Cris, I decided to walk up our hill to find a fuse blown on our power pole. Fortunately, there was an Edison employee who I know that was nearby checking the lines, and he quickly resolved this issue and we went back on the air.

A couple days later, we experienced this again. I was on the mainland when we get hit with an ugly power outage and went off the air, leaving me unable to restart the transmitter remotely. I called Glen, and once again, the cable TV and Internet were also down, so he was buried.

I decided to call a good friend of mine who volunteers at one of the local churches on the island, though I knew he did not have much experience with electrical devices and might be hard pressed to help me troubleshoot and resolve the issue over the phone. The good thing was, I knew he was an excellent communicator, and as he arrived at the plant and called me back, this proved to be vital.

After spending some time orienting him with the plant so he knew the difference between the main transmitter, phasor and backup transmitter, he was able to relay step by step everything he was able to observe in relation to status lights and meters. I had him reset the main breaker to the main transmitter, and that got it back on the air. Then we were able to troubleshoot the issue with the backup transmitter. It lost a connection that caused the interlock to open. I was very impressed by how well this situation went, primarily due to good communication and the ability to observe things step

by step in an organized fashion.

We are on target to solve the issues that allowed these outages to happen, or at least, left me unable to restore the affected equipment remotely and hope to have them all permanently resolved by next month.

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

NV-40 Transmitter Installation

I know. I didn't include the story about the installation of our wonderful new Nautel NV-40 transmitter in *The Local Oscillator* last month. Sorry about that. Really, there's not as much to say as there is to show, so I'll let the pictures below tell the story.

It didn't hurt that not only did I assist in the installation of the first NV-40 to go on the air, at our own WMUZ in Detroit, but before the WPWX Nautel arrived I went back to Detroit on assignment and revisited WMUZ to refresh my memory on what went where in their transmitter. What I relearned made the installation of our rig a lot easier. Even so, it did take us a few days to get the transmitter

commissioned "by the book," which I'm sure frustrated Cris a little bit, but also made for a perfect "first time startup" for the rig. At power-up, around 6:10 PM on March 7, only the remote control and PAD for HD-2 (WYCA on WPWX) were not fully connected. The remote was done within a day. PAD data was more problematic, but the solution for us was to upgrade the TRE program. That should be done by the time you read this.

If I had to change just one thing about the installation, it would have been to build a platform in front of the entrance door to allow the transmitter to be rolled off the lift gate and right into the building. I thought that we could get by without it, but without it, getting it into the building was harder than it should have been and took a lot more people to do. There was slight damage to one of the end panels, which Mack fixed, and which in any event was covered up by the rack next to it, but still, that's the one thing I'd do over again.

And, what about the transmitter's operation? Great, just perfect from minute one. The new air conditioning system is making a big difference in the

ability of the room to stay cool, but the only other glitch in the system is the fact that the two "on line" units like to come up simultaneously. The big UPS we have doesn't like that big in-rush surge, and it complains about it… loudly. We have a fix either in or on its way to make the AC units come on at separate times, maybe five seconds or so apart.

The biggest mystery is this: How can the

NV-40ôs watt meter discern the difference between analog power out and the digital power out, and read them both, separately? Even Cris scratches his head over that one.

Review of the JVC HDR-40

You know youôre a true geek when youôre grieving for a dead radio. But in my life, this wasnôt just any ordinary car radio. This was the JVC HDR-1 AM/FM/HD car radio that had been a gift from my beloved wife Susie on our last wedding anniversary together, in 2007. Sentimental value? Up the wazoo. That radio stayed in my 2003 Ford Windstar from the day I got it until I sold the car last year, at which point I put the factory radio back in the Windstar and put the HDR-1 in my new Freestar.

But something had gone terribly wrong with my beloved wifeôs gift. The AM was almost as dead as a stone. Sadly, after a couple of weeks, I had to retire my friend and put the factory radio back in. But then again, I needed an HD car radio for use as part of my job here at the station. So with considerable reluctance, I went onto crutchfield.com and purchased a brand new JVC HDR-40 HD radio with CD player.

Iôm glad I did. This radio is head and shoulders above what Iôve experienced with any HD radio heretofore. For one thing, the JVC engineers seem to have figured out how to keep the internally-generated digital noise, which I thought was a necessary evil in any digital radio, out of the radioôs front end, on both AM and FM. That is no mean feat. Designers and Ham Radio Operators know that the amount of bypassing, de-coupling, and shielding required to do the job right is difficult to do. But itôs apparently happened here.

When it comes to sensitivity, JVC publishes their specs in the radioôs user manual, but for the life of me, Iôve never seen anything expressed in dBF before, so Iôm still in the dark as to exactly what it is, but I have a little test that I do on radios here in Chicago, at least on AM. I tune the radio to 590 kHz and see if I can hear WKZO out of Kalamazoo, Michigan. The field strength of that station where I live is about 20 uV., and if I can hear *that* station on any car radio, then itôs a pretty good car radio. Matter of fact, I can hear something on almost every channel on either AM or FM with this radio, day or night. It beats the pants off previous generation HD radios.

As you might expect, the sound is fantastic, and of course, adjustable. The CD player is very good; it will ódoô MP3s, though I donôt. It wonôt play audio off of DVDs, but, what they hey? If you like cassettes or any other analog source, there is an aux in jack on the front for plugging in your favorite source. Unfortunately, there is no USB port on the rig. You have to go to the next level higher in the JVC line to get that. That may be the JVC HDR-69, and Cris Alexander tells me he has one of those.

This is also the first HD car radio, in my experience, which allows HD multicasting channels to be saved into memory. That is a really nice new feature, but why wasnôt that done before?

Another plus: This radio is easier to learn than its predecessors, because there are few controls on it. The source switch is also the on-off switch. The menu button has two different sets of functions, depending how long you hold it down at the outset. All this is explained in a rather easy-to-read, comprehensive, tri-lingual manual. I like the fact that English is at the front. The only knock on this part of the radio is that it is more difficult to change between analog, digital and automatic modes. In the old HDR-1, you could do it in four or less pushes on two different buttons. By comparison, on the HDR-40, this feature almost requires an act of Congress to complete. And donôt do it while trying to drive at the same time! (Push and hold the menu button for over three seconds, turn the volume knob and push said knob once or twice to get you to the right placeé . Forget about it!)

There are very few problems with this radio. Installation is a snap for those who donôt mind a little soldering, and Crutchfield provides you with the necessary installation kit, custom-made for your car. Just answer the little questionnaire about your car on the Crutchfield web site, and itôll get it right, no extra charge. The dashboard of your car may require an optional escutcheon at additional cost. Iôm putting one in a Honda Accord Sedan which requires just that, at a cost of an extra $35. After that, things become easy and installation came out well. One thing though. The steering wheel controls donôt work with it. I wonder if thatôs even available in after-market radios anyway.

The problems I have are the same as they have been with most HD car radios. First, there arenôt enough AM presets. Six is all you get. FM has eighteen. I am an AM maven and I find it annoying to have to allocate that precious resource to only a few stations. Those eighteen FM presets are also barely enough when you consider the HD-2 and -3 presets that you might want to add, and I have a bunch. Also, FM analog RDS is not picked up on the HDR-40. I wish it were, and I have no clue as to why it isnôt. Finally, there is a problem with the volume/mute/pause knob, which is the biggest one on the radio (a plus) but which has a rim so smooth that

itôs almost impossible to grip properly to change the volume, without pushing the button in which makes the radio mute (or pause in the CD mode). Thatôs very distracting for those who are driving. The least they could have done was to put those little grooves on the side of the knob. Or you could use the standard remote control, which circumvents that and other problems and makes driving easier, but which also requires a learning curve.

Even so, the JVC HDR-40 is a great little radio for the cash you plunk down for it (now in the $100 range at Crutchfield) and I highly recommend it as an after-market option for your car. . \

Too Good to be True, or, Caveat Emptor

Not too long ago, I was looking for an AC adapter with a USB output, as a charger for something or other, and decided to find it online. Well, I found it, all right ï a little 5-volt thing that was small in size, could be plugged into a tightly-packed outlet strip, and cost all of a dollar. Wow, that sounded like a deal, so I bought one. If it worked out, I reasoned, I could buy a bunch more and sell them at

a profit at a flea market.

It arrived, cute as a button (see picture; note the óCEô symbol), from some place in China. I should have been a warned right there. But I put it to use, and it worked just fine as a charger. Nirvana. And it never did stop doing its job.

But, about two months later, I began to experience horrendous interference to my Bose AM radio which lives on my headboard. It made Chicagoôs all-news station, for instance, almost unlistenable. Then the interference spread to all the other radios in the house. That was enough for me, so I took my little portable AM/FM/Shortwave box around the house, turning things off and on, unplugging and direction-finding, until I found the culprit, sitting right there in my bedroom. You guessed it. Somehow, some component in that cute little module had gone bad, and my dollar USB voltage source would work no more in my home.

No, Iôm not selling it or giving it away. I like AM radio too much to subject anyone else to it. But the question remains, and it should haunt anyone who loves and lives radio, just a little: How many more of these cute little things are out there, doing their dirty work?

Additional Note on FM Stereo Standards Change Article

A couple of months back I ran an article on changing the standard for analog FM stereo transmission to allow the L-R subcarrier to operate either in the existing double-sideband-suppressed-carrier or in a new, single-sideband-suppressed-carrier mode. In that treatise, I mentioned that both the Orban Optimod 8600 and the Omnia.11 audio processors had that facility programmed into their feature sets. I have since been informed by our illustrious Stephen Poole down at Birmingham, that the new Vorsis Air Aura also has that option built into their unit as well. Thanks for the update, Stephen!

More on my Rant Last Month regarding AM Directional Pattern Interference by Cell Towers

After I sent that particular article in, Cris Alexander dropped me a line regarding the regulatory end of this issue. What he had to say was very good news. Read this: ñThere is a rulemaking in progress that moves all AM antenna protection to Part 0 (zero), which will make such protection applicable to *all* antenna structures *and other structures*. Right now, Part 90 (public service), Part 101 (fixed microwave) and others have no requirements to protect AM antenna systems. Nor do elevated water towers, buildings, billboards and the like. The new rules will fix that.ò

Well, if *that* isnôt about time! Thanks, Cris, and Thanks, FCC. Now, letôs ógitterdoneô!

Next month, I will tell you folks a story about a certain AM Directional array. You wonôt believe it, even if you see it. Until then, keep counting those blessings.

Until next month, blessings!

The Portland Report

By
John White, CBRE
Chief Engineer, CBC–Portland

Last month, I commented a bit about some of the limitations and successes of EAS locally. On the success side was the tsunami warning released on the Oregon Coast. The alert went smoothly with few known problems. But this example was with a long lead time warning and the opportunity for the news operations at local stations to follow up the warning with local news coverage.

I still have great concern with public reaction when the weather bureau released the tornado warning, specifically the lack of public response, as though EAS is a system of cry wolf. This is clearly not consistent with broadcastersô goals of public protection.

Obviously the reaction in Alabama is likely to be much different than in Oregon, where a tornado never happensé . except for the tornado a few weeks backé but of course Oregon never has tornadoes. Obviously we walk a tight line between adequate awareness and over-hype.

Since that tornado experience, we have had further examples of the need to consider the EAS and public interface. The Portland area EAS plan is built around automatic civil authority activation. The idea is to eliminate the need for broadcaster intervention for tests or actual emergency alerts.

The most recent RMT was a failure from that prospective. On the first try, the test propagated through the system with two minutes of silence. The makeup RMT didnôt have silenceé the second try had two minutes of broadcast programming. Obviously these kinds of false alarms are not good for the public perception of the usefulness of the system.

Itôs a complicated problem to deal with and much larger than hardware. Here in the Portland operational area, we have six different civil authorities who may initiate an emergency alert. We do cycle through each of those initiators for an RMT. Still, with the number involved, that means a live test only once or twice a year for any one initiator.

From my point of view, the major problem becomes one of developing procedures that are reliable and simple. I want to emphasize something here. We are dealing with a *people* and *process* problem. The worst outcome would be a complicated and bureaucratic solution.

The report on the BP oil spill is a perfect example. Deep within that report is one simple paragraph about the cause of the incident. The primary cause of the accident was a clogged pressure sensor that gave false low pressure readings. The take away was why the pressure sensor was clogged, and that had to do with bureaucratic regulations. Regulations which caused more drilling fluid to be used than was necessary.

Another example is the Japanese reactor problems after a 9.0 earthquake follow by a major tsunami. Fairly early on, the pressure was building in one of the reactors. The normal response is to vent pressure to keep the core cool. That was delayed as regulations required obtaining permission from regulators first. The result was a buildup of hydrogen, and that created a chemical explosion. Had the venting been done on a normal schedule, many of the later problems could have been prevented.

Stay tuned as we all try to develop the proper procedural balance. I suspect, though, that the title of a childrenôs book may apply: The Never-Ending Story.

So we move on to disaster recovery. They happen every day. Something like last week when one of our staff went to let a late night replacement in the building. That latch turned and the door didnôt open. Detouring through the kitchen door, a number of things were tried, none of which opened the door. Does this happen at 10:00 AM on a Monday? Of course not. It has to happen at 5:30 PM. Fortunately we have a relationship with a local locksmith, so a late evening call got the problem resolved.

And computers. Who could forget computers? Like the control room computer that has a problem booting. So the operator decides to reload

Windowsé almost never the proper answer. In this case it sure wasnôt. During the move to Mt. Scott, the computer setups and other data was supposed to be documented. With several different people working on the new installation, that became the other guyôs job. I think we know how that works.

The computer is back working now and my lesson was learned. We now have hard copy. However, I plan to go the next step. The best answer is to do a full system backup, including program and setup files, for all critical systems. I will report more next month.

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

Spring Cleaning

Spring has sprung and so has the cleaning process. It has been a couple of years since I have had the time to really clean the sites up, but I have already begun the cleaning process this year.

Over the last several months, Keith has been working on getting equipment organized at KLZ (we keep our stock of spare equipment out there). I must say, I am very pleased with how great the shelves look. Over the years we had just tossed unused equipment on the shelves with no rhyme or reason. It was beginning to look just plain horrible. So I had Keith take the equipment off the shelves and begin the process of organizing. He also did a tremendous job in the workshop. I have never seen the area so clean.

The only major cleaning I did at KLZ this month was mainly organizing. I put all the product manuals with the equipment manuals behind the transmitter in the file cabinet. I cleaned up the workbench quite a bit. Still, there is a lot more work to be done at KLZ.

At KLTT I cleaned the aux transmitter. On the advice of Nautel, I am no longer going to clean the transmitters the way Ed and I did for so many years (as recommended in the instruction manuals). Weôd take out each power cube, then remove each module and make sure everything was tight. While this is a good idea, I found that every time weôd do this, when we put Humpty Dumpty back together again, something always wasnôt right. This would then turn into an ordeal trying to figure out what the problem was. It would then turn into a lot of money for parts that might be needed to fix the module. Instead, I will just spray out the cubes with our hefty air compressor that we keep at the site.

I have some more work to do at KLVZ by way of spring cleaning as well. I hope to get it all done this month.

Leaky Something

The dehydrator at KLTT has run nonstop now for several months. We have verified there is no leak in the lines. I was on the phone for about an hour with Radio Frequency Systems troubleshooting the unit. They had me do several things to check for leaks and everything looks to be working properly. The next step is to replace the unit with a Gast dehydrator that was left at the office by a former radio station. It is a nice unit and hopefully it will work. The goal here is to see if the issue moves to this new unit. If it does, it verifies the issue is with our pressure valve. If it doesnôt, something is still wrong with the unit and further troubleshooting will need to take place.

Never Ending A/C Problems

We are also having more air conditioning problems at KLTT. It is not cooling much. We had a day the temperature stayed in the low 50s. When going into the building, there was a 30 degree difference. I can understand ten degrees or so difference, but when it is 80 degrees inside the building and air is blowing like mad out of the vents, there is something wrong. Choice Mechanical has proven they cannot find the source of the issue and fix it. We have moved onto a new contractor that we have used for our studio system, Wern Air. They did a great job figuring out the zone control system at the new facility and it is my hope they are able to figure out the cause of the problem at KLTT and fix it. Not

having a backup unit is making it difficult to keep the site cool. The repairs to the hail-damaged backup unit would be well over $3000. The $3000 is for just one of a few parts needed, also not including labor.

Modeling

Last month we wrapped up the work at KLTT needed to model the day and night patterns and license them under the new rules. We had to do the work at night when we werenôt in paid programming. It was a wet night, too. Since spring has begun, so have spring showers. Thankfully it only rained hard for a little while and then went to a very light rain before drying up altogether before we finished up. I went prepared in my hoodie and a rain jacket with some boots on.

Keith met us out there so he could clean up the ATUs, which were a disgusting mess. We had begun the day by taking the network analyzer and other test equipment needed for the project from KLZ to KLTT. My dad was able to set it up so we could verify it was working and also so that we werenôt wasting what little time we had to work that night.

We all met at KLTT at around 7:30 PM on the 20th. I had the task of removing all the sample transformers and doing what my dad needed so he could measure the base impedance matrix. While I did this, Keith cleaned the ATUs.

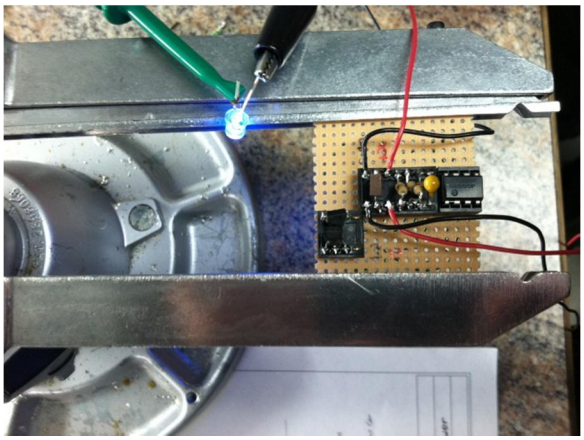
Removing the transformers wasnôt that hard. Putting them back together at the end of the night was a chore, however. Three of the four towers have doors that open to the right. This means you canôt reach around to unscrew the transformer all the while holding it to keep it from dropping and breaking an insulator. From the looks of one tower, this happened in the past.

I found a way to easily get them out, and Keith had to help me in putting them back in once we were done calibrating them. I ended up losing one screw, but was able to find it in the midst of some recent growth at the tower base.

Keith will make plans to go back to the site one night to continue cleaning the ATUs. It is so much easier to clean when the site is off and there is no worry of frying an arm or hand. Plus it will be easier to get into the coils to get the dead flies out. There are some holes in the ATU cabinets that need to be sealed where these bugs are getting in. New weatherstripping has been purchased will need to be put on the units as well..

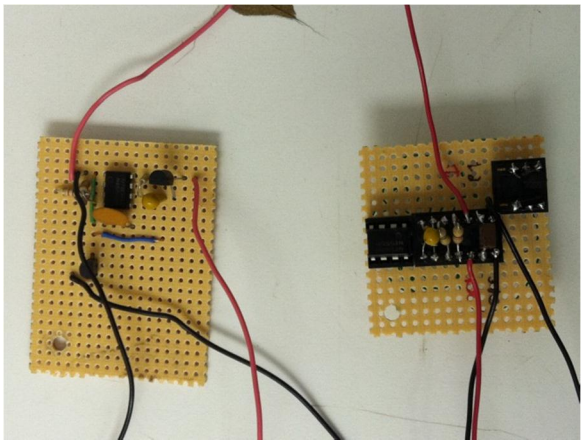
Lightning Protection

We were able to finish up the lightning protection circuit for the KLTT ND-50 that I



Bench testing the new circuit.

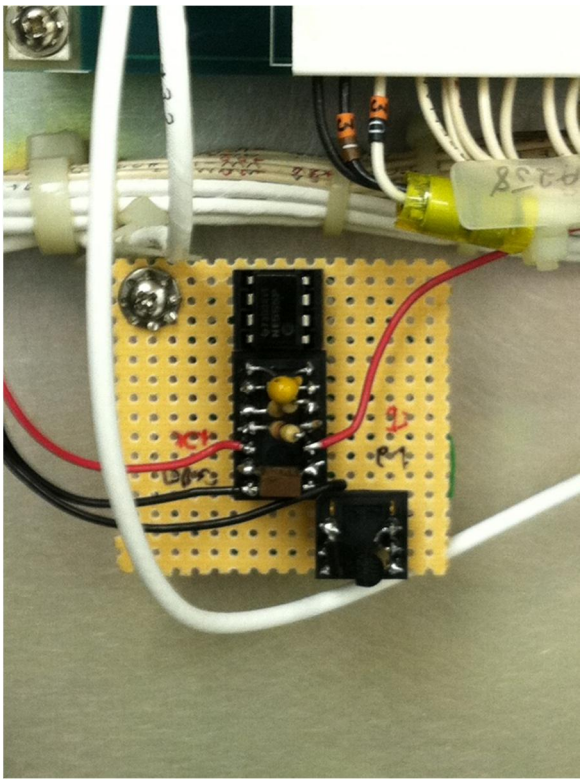
mentioned last month. One thing we found while trying to figure out the old circuit was the voltage source it was connected to would lose power during the day/night transition. When it came right back up a second later, it would trip the circuit, causing the station to go to low power. We made some modifications of the circuit. The most important one was the source of power. We found a constant +24 V source on the transmitter and were able to use a 5-



The old (left) and the new (right)

volt regulator to drop the voltage down to a workable value.

I learned a new way of making a circuit on a perf-board ï wire-wrap. Below is a comparison of the original circuit to the new circuit as well as the finished product in the transmitter and of the unit being tested using an LED. Since putting the unit in, we have had no more issues. It was brought to my attention that we still have the CBC Files site for us engineers. I donôt think Iôve ever used it. On that site was the original schematic of the circuit. Thank



The new circuit installed in the ND-50

you to Ed Dulaney for letting me know about it. I have since bookmarked the site in hopes of not forgetting about it again. We also went ahead and printed off the new schematic we made and put it in the Nautel binder at the transmitter. What better place for the schematic than at the site it will be used at?

False Alarm

April brought two false fire alarms at KLVZ. One was at 2:30 in the morning. The other was a few hours short of a full week later at 10:30 PM. When I received the phone call at 2:30, I immediately logged on to the security cameras at KLVZ. I figure if there was a fire, that wouldnôt work because it would be burned upé or we would see flames! The cameras worked fine; I didnôt see any sign of a fire, so I called Keith to have him meet the fire department out there since he lives a little closer and usually he is awake at that hour.

I wasnôt planning on going out there, but then thoughts of firemen with bolt cutters and axes crossed my mind. We don't have a Knox key box at this site. The fire department would just cut their way in to make sure it was okay. Thank goodness John works on the fire department. John is a guy who helped out quite a bit with the buildout of the studios, and his full-time gig is with the Brighton Fire Department. He knew us and knew the guy who set that building up out at the site. He ended up jumping the gate, knowing his friend, Mike Kilgore, had recently fixed it so itôd quit dragging. He also called to get the code to get in the door. All was fine. I ended up out there that night as well to verify everything was okay. The next day Keith cleaned out the smoke detector thinking maybe it was cob webs or something of the sort getting in the way.

Nearly a week later, I get the phone call. ñThis is so and so from Security Central. This is in regards to your site até We have received a fire alarm and have notified the fire department to dispatch.ò Great. Not again! Was John working tonight? I sure hope so. I had Keith go out this time since it was early. The police stayed around after the call to check on things. Keith informed me they checked him out good. I am happy to announce no warrants for Keithôs arrest have been put out. With this second alarm, I decided to put a trouble ticket in with Security Central. Nearly $300 later, we have a new smoke detector. No more false alarms, thank goodness.

AutoPilot 2010

We finally received a license for Jet for AutoPilot 2010. It is a flow chart application that runs like a script. So no more having to find the correct wording to get a script to work. I am still trying to figure out this program and hope to get it figured out soon so I can get our ñscriptsò done in the flow chart so we can begin the transition over to 2010 from AP3.

Update on the Home

Last edition I mentioned Iôd be closing on my first home on the 15th of April. Well, we hit a snag and ended up at a different lender. I closed on the last Friday in April and am now a homeowner!

Also, please be in prayer for all those affected by the fires in Texas. Our good friend Robert ñBubbaò Payne, who has helped build several of the studio and transmitter sites around the company, is near the fires in Palo Pinto County, TX. If you watch The Weather Channel, they are referring it to Possum Kingdom, TX. The fires have destroyed many homes and a lot of land with no end in sight as rain is very little and winds are very high. Thankfully Robert is safe for now.

That about covers it for this edition so until next timeé thatôs all folks!!!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

Terrestrial Radio or Ones and Zeros?

Similar to most other articles Iôve written while at CBC, my article this month stems from a recent conversation ï actually an email exchange ï I had related to the future of terrestrial radio as the use of Internet based radio increases. After providing a response based on the knowledge I possessed on the subject at the time, I decided to research this further and report my findings and thoughts in this monthôs article. Lucky you.

This can obviously become a multi-faceted argument, so for this article I will narrow the scope to content delivery.

Although Iôm not as familiar with the detailed ins and outs of radio technology as others who read *The Local Oscillator*, I do know that the signal is transmitted through the air without significant obstructions aside from interference related to other competing signals or physical structures. I know, stick to the computer stuff and leave the radio stuff to the professionals. My point is, there are far fewer ways to block a terrestrial radio signal than there are with Internet based radio. I recall a history program I watched not too long ago discussing Radio Free Europe in the late 60s and the attempts by Communist authorities to jam their signal, preventing the citizens from listening to the programming. Despite their efforts, it was later found that many were able to tune into the degraded signal. Even though the audio coming out of those radio speakers was probably scratchy and distorted, it was still getting through and people were still listening.

On the other side of the coin, there are many more factors that can quickly eliminate an Internet broadcast. Unlike a radio signal, an Internet signal is either up or itôs down, excluding network lag. The Internet signal can be easily blocked by the Internet Service Provider (ISP), or a network failure along the line can put a web-based radio broadcaster ñoff the air.ò I recently stumbled upon an article discussing how the Chinese government instantly blocked citizen access to all religious-related web sites, which I would presume would include religious programming broadcasters. Granted ï and thankfully ï I canôt see the U.S. government doing this in this day and age, but the fact is that it is technically possible. The point is Internet based radio can be and has been shut down nearly instantly if there is the desire.

Aside from the ñbig brotherò aspect of it, the other looming issue is bandwidth. Saying that there has been a significant increase recently in smart phone, tablet PC, and other such mobile device usage is definitely no profound statement. A report published by IDC showed that there were over 450 million mobile Internet users worldwide at the end of 2009 and they expect this to double by the end of 2013. According to Cisco Systems, mobile data traffic tripled for the third year in a row in 2010 and they predict that by 2015 your mobile device will use 16 times more bandwidth than today. Further, a reported 1.6 billion people globally used the Internet in 2009. I suspect this number is significantly larger today.

Broadband usage has also changed dramatically in recent years. Weôve gone from sending small email messages and viewing text based web sites, to fully interactive online experiences, streaming movies, and listening to online radio for hours on end. I recently heard that YouTube usage alone accounted for 10% of global mobile data usage. That equates to a huge amount of data being moved continuously on an internet infrastructure that is reaching its limits. In the immortal words of Scotty from Star Trek, ñIôm giving her all sheôs got, Captain!ò

Smartphone users have already been complaining about bandwidth issues within major cities. The network provides can see the path becoming more narrow ahead and are acting in several ways. One such example is AT&Tôs bid to purchase T-Mobile for a reportedly $39 billion. This would quickly expand AT&Tôs network infrastructure and hopefully alleviate some of their problems.

Further efforts include limiting bandwidth usage on these networks. The days of unlimited Internet are over. In late March, I was informed by AT&T that my formerly unlimited Internet service would now be limited to 150Gb per month with an additional $10 per 50 Gb in excessive of that limit. As one reporter stated, ñThe all-you-can-eat broadband buffeté is coming to an end.ò Although a general user may never exceed the 150Gb allotment, those who regularly stream movies or other data heavy content via their broadband connection could quickly see additional charges.

Aside from the service providers, businesses are also feeling the crunch of significant bandwidth usage by their employees. Late last year, I spoke to a good friend of mine who is the IT Director at a fairly large company. He mentioned as part of a new company policy, access to sites such as YouTube, Hulu, and others would be blocked from network users. Further, they would be disabling the ability for their employees to stream online radio. Aside from the decrease in productivity he claims is created by these distractions, he added that the ongoing network usage had increased to the point that work related tasks were being affected. Will other companies follow suit?

The final point I must make that I feel is an ace in terrestrial radioôs pocket is the fact that terrestrial radio requires no change to accommodate added users. This excellent point was touched on by Frank McCoy in his 2009 Radio World article. He further addressed the bandwidth limitations, as I mentioned earlier, that will only intensify as broadband usage expands further into other areas of our high-tech lives such as our cars as an example. The Ford Sync system has already tapped into the broadband network to provide drivers with internet access. During the 2011 Consumer Electronics Show (CES), Verizon unveiled its 4G LTE equipped Buick LaCrosse with mass market production possibly right around the corner. To put this in perspective, a recent study showed that over 40 million driving adults expressed a desire to have Internet access as part of their vehicleôs equipment. Even if only a fraction of these users decide to stream web based radio, it could easily take bandwidth usage to its limits especially in heavily populated areas.

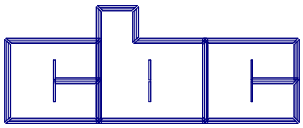
Even as broadband providers scramble to either expand their network capabilities or reduce user impact on their current infrastructure, the truth is that the increase in demand has the potential to out pace their efforts. Users may ultimately be faced with the decision to either deal with a web based radio stream that cuts in and out due to network lag or simply tune into the uninterrupted local terrestrial radio station. The ultimate deciding factor may be the potentially cliché term *Content is King*. Although Bill Gates was referring to web site content when he used this as the title of his 1996 essay, it is immensely relevant to radio. Build it and they will come. I also believe that the future of radio requires the co-existence of terrestrial and web based delivery. Since the inception of radio, the only means of delivery, albeit geographically limited, has been via the air. The internet now provides delivery of the same content to a significantly broader audience. Itôs quite obvious that a local advertiser will most likely have very little to garner from someone listening hundreds of miles away, but perhaps the key is to utilize web delivery as simply another platform. Keep the hometown feel with local advertisers and reserve the national advertisers for the web based radio.

Of course that approach can be argued as well, but the truth is the Internet is not a passing fad. Itôs here to stay, at least for a little while longer, and it does possess benefits for terrestrial radio. Unlike the recent decline of newspapers as a result of the internet, radio is advertiser supported rather than funded by subscriptions. Newspaper subscribers were lured away by the free availability of the same content online, a fate that I donôt believe will be shared by terrestrial radio. So as bandwidth limits become more stringent and more users move from their ñdumb phonesò to web enabled smart phones, the need for uninterruptable, consistent, and dependable terrestrial radio will shine brighter. Teamed up with exclusive and compelling content, and you have a combination that will leave those stale, automated web based broadcasters in the dust.

Until next month!

KBRT • Avalon - Los Angeles, CA
740 kHz, 10 kW-D, DA
KCBC • Manteca - San Francisco, CA
770 kHz, 50 kW-D/1 kW-N, DA-1
KJSL • St. Louis, MO
630 kHz, 5 kW-U, DA-2
KKPZ • Portland, OR
1330 kHz, 5 kW-U, DA-1
KLZ • Denver, CO
560 kHz, 5 kW-U, DA-1
KLDC • Brighton - Denver, CO
1220 kHz, 660 W-D/11 W-N, ND
KLTT • Commerce City - Denver, CO
670 kHz, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Denver, CO
810 kHz, 2.2 kW-D/430 W-N, DA-2
KSTL • St. Louis, MO
690 kHz, 1 kW-D/18 W-N, ND
WDCX • Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2
WDCX • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT
WEXL • Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D
WLGZ-FM • Webster - Rochester, NY
102.7 MHz, 6 kW/100m AAT
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT
WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT
WYRB • Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT
WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND
WYDE-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT
WXJC • Birmingham, AL
850 kHz, 50 kW-D/1 kW-N, DA-2
WXJC-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT

CRAWFORD
BROADCASTING
COMPANY



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