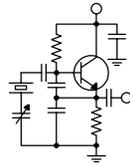


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

DECEMBER 2007 • VOLUME18 • ISSUE 12 • W.C. ALEXANDER, CPBE, AMD, DRB, EDITOR

Escalation

In past issues of *The Local Oscillator*, we have dealt with the issue of copper theft. It's nothing new. I remember hearing stories many years ago about \$50,000 AM ground systems turning into \$25 in beer money in just a few minutes. Some of those tales were undoubtedly embellished a bit, but the reality is that copper theft has been happening for a long time.

With copper prices way up (along with just about all things metal), the frequency of copper thefts has certainly stepped up a few notches. It's been in the news on a regular basis, and there have been some rather gruesome photos making the rounds on the Internet of a copper thief who met his demise when he came into contact with some high voltage. I wonder if all the press hasn't made things worse. Thieves whose focus had been elsewhere may have begun targeting copper when made aware of its value and abundance in certain settings.

Crawford Broadcasting Company has certainly had its share of copper thefts in the last couple of years. So far, this has been mostly limited to ground wires and straps around our tower bases, although you may recall that in one instance, the thief actually cut open the outer jacket on a piece of 5-inch Heliac, exposing the shiny copper underneath. Thankfully, that was the extent of the damage to the transmission line, but that episode portends the

disastrous potential, both for the station and the thief.

Last month, we had an episode where a copper thief made an attempt at the feed tubing and ground strap at one of the towers at the 50 kW WXJC site. While the thief ignored the warning signs on the tower base fence, evidently he heeded the warning he got in the form of a painful RF burn! The damage there turned out to be minor, but again, it is very likely a harbinger of things to come.



A copper thief is caught on a security camera shooting out the light at a Birmingham tower site.

(Photo courtesy of Bob Newberry/Clear Channel Birmingham)

In late November, we got a peek at where things are headed. The WDJC-FM tower site is located on the south end of Red Mountain in Birmingham. Our tower is just a few hundred feet from the Clear Channel tower right next door. In fact, we share the same access road and driveway. Both sites are well fenced, but Clear Channel has taken additional security measures, including an array of high-resolution surveillance cameras and a perimeter alarm system. Copper theft has been a real problem for Clear Channel at

this site. We, too, have had some issues, but not to the extent that our neighbors have.

One evening last month, market chief engineer Bob Newberry and his assistant had just left the site after replacing some copper strap that had recently been stolen. They were in the car on their way back to the studio when they got notification that the perimeter motion detector alarm had been tripped. Thinking that it was a false alarm (they had, after all, just left the site), they went on to the studio and

looked at the security video. What they saw gave everyone involved pause.

A man emerged from the woods onto the access road, pulled out a pistol and fired three shots at the security light outside the gate. The third shot took out the light. The thief then climbed over the fence, used the ice bridge to get onto the building roof, then reached under and cut the cable to the security camera covering the tower base area. He then helped himself to the just-replaced strap and the grounding plate.

Three things came to mind as I read the account of this incident. One, the most alarming, is that copper thieves are now carrying guns. That escalates things to a whole new level. What might happen if one of our engineers came upon an armed copper thief during a nighttime site visit? That's something we're going to have to consider going forward.



Copper thieves slit open the outer jacket on this 5-inch line to expose the shiny copper beneath.

Another is that these thieves are willing to go to great lengths to get at the copper. Bob Newberry had coated the new strap with roofing tar after installing it to discourage theft. That mattered not at all; the thief took it anyway, gooey tar and all. The grounding plate had been cold galvanized and didn't even look like copper. You guessed it – the thief took it, too. In past break-ins, the thief had removed the gate hardware and taken the gate off its hinges to get in. Bob had installed some heavy chains to prevent this from happening again. This time, the thief snipped through the fence fabric and made a hole to get out.

The third is that it's just a matter of time before our transmission lines – main and auxiliary – are targeted. That will take our stations completely off the air and it will take days to get back to full power.

So... what now? How can we protect our tower sites? That's a question I have been pondering, and I'm open to any ideas that you may have. There are some site-specific avenues that we are jointly pursuing with Clear Channel in Birmingham, but those avenues are not open to us in other locations.

Normally, protecting a site (whether it's a tower site, a studio or even a home) requires the two-pronged approach employing deterrence and detection. Deterrence takes the form of anything that makes the site unattractive to criminals, things such as fences, lights and alarm/video surveillance signage. Detection usually comes in the form of an alarm system that notifies the authorities in the event of a break-in.

The problem with tower sites is that they are usually remote and isolated. This buys the criminal time to get in, do his evil work and get out before authorities respond. The deterrence elements become mere inconveniences; the detection simply starts a timer on the escape.

Clearly we're going to have to change our thinking from this old model to something new. Based on what I'm seeing and hearing, we'd better hurry.

Tagging

When I hear that term, I think of graffiti artists painting up the side of a building or an overhead freeway sign (or the barn at the KLZ transmitter site!). We certainly see plenty of that in our society. But what I'm talking about here is a different kind of tagging, specifically iTunes tagging.

You've no doubt seen in the trade press that HD Radio now has the capability of providing iTunes tagging in receivers that are so equipped. In practical terms, this means that if a listener hears a song he likes that he wants to purchase, he can hit a button on the radio and "tag" the song for later online purchase. The great thing about this is that the listener doesn't even have to know the song title and artist. Like the song? Just hit the button. A bridge is provided between terrestrial radio and the iPod, just like that.

Crawford Broadcasting Company has opted to participate in iTunes tagging. This does represent a new revenue stream for our stations, but as you must know, that revenue is unlikely to be significant for some time to come. The real advantage is that it keeps us on the cutting edge, taking one more step to

improve the listener experience.



The barn at the KLZ site is a favorite "cavass" for taggers

The tagging mechanism on the station's end is fairly straightforward. Each NexGen song database entry must include a metatag, essentially an iStore catalog number for each individual song. We're working on getting the iStore database right now and anticipate having it available to the stations within a few weeks. Then the work begins, looking up each song title/artist/version and keying in the metatag information. Obviously this isn't going to happen overnight.

In preparation, however, we must get NexGen updated to the current version (2.7.4.9). We will provide information on this to you by email shortly. In fact, we are using our two Denver music stations as test beds for the iTunes tagging technology. As soon as we figure all this out, we'll provide each of our market chief engineers with detailed instructions.

Rhetoric

I am continually amazed at how many folks read the pages of *The Local Oscillator*. On a regular basis, I get email responses from people I have never heard of saying they read this or that in its pages and offering comments or criticism. More than anything else, that says to me that I have a great responsibility in editing each edition.

You have no doubt read over the last six months or so some of the rhetoric about the predicted demise of the AM broadcasting service as a result of AM HD Radio, with a particular emphasis placed on *nighttime* AM HD Radio. I have dealt with some of this in the *Oscillator*, providing what I believe has been a reasoned analysis of the issue. In a recent issue of *Radio World*, Paul McLane put the spotlight

on this analysis, and he did a good job of it (as he always does).

Behind the scenes, however, there has been a barrage of online rhetoric on the issue. One gentleman, ostensibly the leader of the "Chicken Little" camp, continues to hammer away and stir things up without much more than a tip of the hat to the *facts* and particularly the empirical data. No doubt you will soon see more of his rhetoric in the opinion pages of the trade press. I won't mention his name here, but you'll know it when you see it.

Throughout the months leading up to and following the Great AM Nighttime Digital Experiment, I have deliberately tried to stay away from all the online oratory. A few folks have forwarded me some of the threads, but otherwise I have not been plugged into the dialogue.

Someone recently asked me if I wouldn't like to get into the argument. Some of what I have written herein was attacked with a "scientific" argument. I told that person that I would pass.

As with Chicken Little of fairy-tale fame, all the rhetoric has done nothing more than alarm the uninformed, particularly the owners/operators of smaller market AM stations. Those poor souls must believe that they might as well turn off the transmitter and lock the door!

To those folks, I would counsel *wait and see!* The "sky is falling" cries of the alarmist anti-HD camp notwithstanding, there is little reason to fear. As we continue to wade into this thing, where *real* interference is *proven* to exist by scientific methods within the *protected contours* of spectrum neighbors, we'll deal with it – between stations for the most part and with the FCC getting involved in rare cases.

That is exactly what we are going to do: wait, see, and if necessary, make adjustments. It is the only reasonable approach.

Eighteen Years

This issue marks the end of the eighteenth year of publication of *The Local Oscillator*. It started out back in 1989 as a means of sharing information between the various markets – we only had six in those days. As the company grew, the newsletter grew.

At some point, and I don't recall exactly when, I turned out the writing duties for most of each issue to our engineers. That turned out to be a good move. We have some of the best and brightest in this company. That these folks write well and know what they're talking about is evidenced by the way their columns appear in other national trade publications several times a year.

We moved from mail distribution to online publication several years ago (although we still mail out a few hard copies), and that has extended our reach to a worldwide readership. As I mentioned above, I get notes from all over.

I am honored to serve as editor of this newsletter, and I look forward to beginning our nineteenth year next month.

Merry Christmas!

As we head into the Advent Season, you won't get any of that "Happy Holidays" stuff from me, nor will you get a "Season's Greetings." Around my house, we celebrate *Christmas*, the birth of Jesus Christ our blessed Savior. We don't put up a "holiday tree" or a "family tree"; we put up a *Christmas* tree.

And while the world around us is abuzz with the shopping frenzy and all the hoopla of the season, we will be thinking about that Bethlehem Babe, Jesus, who left His throne in glory to become one of us for a season, face all the trials and temptations we deal with on a regular basis, and ultimately give His very life in exchange for ours. On Christmas Eve, we will celebrate His birth, life, death and resurrection – *the whole package* – because that's what the season is really all about.

So *Merry Christmas* to you and yours! I pray that the season brings you joy as you are reminded that those of us who are in Christ are a people redeemed. May God's blessings rest upon each of you!

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

Hello to all from Western New York! In last month's column, I reported on the current state of the Buffalo market's HD Radio progress. The biggest problems I found with the stations monitored was time alignment and audio levels. I attributed this problem to a lack of communication between the engineers in our market, and little or no activity with the local chapter of the Society of Broadcast Engineers (SBE).

The local SBE chapter is primarily television oriented, with very little radio representation. I will be working diligently over the next several months to get more of the radio engineers involved in the SBE local chapter. Hopefully, I will be able to generate enough interest in our local chapter to help bring a good solid core of radio engineers together to talk about and remedy the many problems encountered in our market.

If any of you have any suggestions or comments on how your SBE chapter is operating, please drop me an e-mail at brianc@crawfordbroadcasting.com. I would be very interested in how your local chapter entices radio engineers to participate in monthly meetings.

WDCX – Buffalo

The second week of November, I began installing our new AudioArts D-75 console in the main WDCX air studio. The installation took a little longer than planned, as I uncovered a hornets' nest that was left over from the former engineer. As no documentation was recorded on the majority of previous wiring, I had to singularly trace out each wire to determine its source and destination and incorporate the findings into my own wiring documentation. Once this is all completed, I should have a good wiring scheme for our entire facility.



Work on the new WDCX transmitter building is slowly moving along. The electrician has the electrical wiring into the new building but has not yet tapped into the main power source that will feed the new building. He anticipates having this completed the first week of December. Our fence contractor has ordered the 3-inch galvanized posts for the ice bridge supports, but has reported a two to three week delay from the manufacturer. He assures me that once they do arrive, he will be able to get them installed before the ground freezes. Once the support posts are in place, Don

Boye of Western Tower Service will fabricate and install the ice bridge from the tower to the coax inlet on the side of the building. Once this is done, we can then begin the process of moving the transmission lines over to the new building and relocating the transmitters and related equipment. I am praying that the snow holds off until we can get this project completed.

WRCI / WLGZ – Rochester

The last week of November, I replaced our old AudioArts R-60 console in the WLGZ air studio with a new AudioArts D-75 digital console. This installation went fairly smoothly, with no major surprises to report on. I am rather pleased with these digital consoles; you really get a lot of bang for your money, and they sound excellent! The only other thing I would recommend, is to purchase the wiring harnesses already made up. It took a lot of time to fabricate the wiring harnesses for all three consoles, time which could have been better spent on other things.

I am still struggling with getting WLGZ's night-time HD to work properly. Almost a year ago, I performed a sweep of the day and night common point busses, and submitted those results to corporate engineering for evaluation. Using the data I submitted from the sweep, Cris determined that we needed to make a change in the night-time common point network to get the phase rotated from -90 degrees to -80 degrees. This could be accomplished in the present

night CP network without changing or adding any additional components. I rang out the three coils in the net, and set the reactances to the computed values. This did not present a good match to the transmitter, and a very high VSWR was noted on the Nautel ND-5 transmitter. I went back again the last week of November and re-measured/adjusted the night common point, to insure that I did not make a mistake on the previous adjustments, and received the same results. After talking this over with Cris, we decided at this point that I should go back and sweep the night CP again, that perhaps we were working with erroneous data from the beginning. I will keep you up to date on the progress in future reports.

On the WRCI side of things, we will be preparing for the installation of another AudioArts D-75 console in the main control room, along with a new digital console for the WRCI production room. Once these items have been completed, we will be in very good shape for a number of years to come. All the cabinets were replaced two years ago with Arrakis studio cabinets, except for the WLGZ air studio, and all consoles will be less than a year old. I still have some projects on the back burner from two years ago. Perhaps 2008 will be the time that I can finally get these done and put to rest!

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 *Merry Christmas* to you and yours!

The Motown Update

By
Tom Gardull, CBRE
Chief Engineer, CBC–Detroit

I worked on cleaning up some loose ends this past month. Our leap into the digital audio age has made me look closely at our audio paths. We are all supposed to have very few analog to digital conversions along the audio flow. Our Wheatstone audio system and surfaces can operate in the digital and analog domain simultaneously. That feature allows many choices for equipment routing. The challenge is to minimize the need for analog input/outputs.

WMUZ is now totally AES from the NexGen source through the profanity delay, the mechanical system bypass switch, the audio processor, the stereo generator/clipper and into the exporter. We insert EAS via a temporary connection called a Wheatstone “salvo” and send it to the HD-2 importer at the same time. The only regular analog inputs remaining are the microphones and telephones.

WEXL is also totally AES from the NexGen source through the Wheatstone system, the profanity delay, the system bypass, the APT Oslo STL to the transmitter site and into the NE-IBOC exciter. EAS is inserted by a Wheatstone salvo. There were two conversion problems at the transmitter site. Our backup audio comes from an ISDN codec, which is analog, and the backup transmitter input is analog only. The answer was to use a Flying Cow A/D converter, which became available when the Oslo went into service with its own AES module.

We use the Flying Cow analog input to convert the ISDN to AES to feed a mechanical switcher for a choice between the ISDN AES feed and the Oslo AES feed for the site. The output of this switcher is split. One path continues to the digital processor for HD, and the other returns to the AES input of the Flying Cow, making a return to the analog domain for the backup transmitter processor.

Thus, WEXL can feed either audio path to both transmitters.



Our audio sounded good before removing the A/D conversions. The biggest improvement was made with the installation of the Wheatstone system a year ago. Going digital at the studio was noticeable. The A/D improvement now was subtle. There is a new clarity, but it does not jump out at the listener. I guess you would describe it as an incremental change.

The WRDT path still has A/D conversions. We have two transmitter sites, both of which are fed by analog paths. We also let the NexGen system switch several satellite-supplied analog programs into the audio paths at the studio. Some of this might change after the AmbOS project is implemented. The AmbOS receiver is supposed to have AES outputs. We would still have the *Healthline* program from analog Starguide. But the biggest obstacle is still the program path to the transmitter sites.

Our source for most programming is the NexGen system. The system ASI audio cards support simultaneous analog and AES audio outputs. We use the digital outputs but still have the analog outputs wired for backup. Since only the analog outputs supply a mix channel, we have a Kramer A/D converter to give us a bypass option for problems. We can take the AES studio off-line but still keep us digital.

I am having a problem removing one A/D conversion. Our studios can do production into the NexGen. But I cannot get the NexGen ASI audio cards to accept an AES feed. These ASI cards are designed to be software controlled to switch between Analog and AES. I have not been successful in making that switch yet, so the input is analog.

News From The South

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

Congratulations Jimmy Parker!

The first thing we must do this month is give a noisy “attaboy!” to Jimmy Parker for passing the CBT examination. For those of you who don’t know the man, he first came to us 2½ years ago as a board operator and quickly proved to be one of the best. Todd and I soon realized that he had a very good mind (and a great ear for sound) lurking beneath that mild-mannered exterior.

Jimmy told us that he’d been to the Musician’s Institute School of Recording (Audio Engineering) out in California, so he knew his way around a studio. He began helping us with various projects, including the new studio buildout here at 120 Summit in November and December of 2006. In February of this year we brought him into engineering full time. I’m not surprised that he passed the test, not even a little bit. Congratulations Jimmy!



From The “My, How Time Flies!” Department

Thinking about that made me ask: has it really been a year since we did the new studio buildout? The calendar says so, and so I must assume that it has. As related in previous issues, we were under extreme pressure to get everything finished and five (5!) stations moved before the end of December. There had been delays during the construction; we had to wait (and wait) for the certificate of occupancy; and we couldn’t even finish the CAT5 wiring until after the final electrical inspection! Talk about being rushed ...

Jimmy and Todd both took that all of this in stride. But you should also know this: what really convinced me to request that Jimmy be moved into engineering full time was the way he acted during that high-stress period. People, *this man was able to trade bad puns with Ed Dulaney without batting an*

eye! (And I must add here that if you’ve never heard Ed having pun with words, you have no idea just *how* bad it can be.) Then Jimmy would turn around and swap barbs with Robert “Bubba” Payne and Rick Sewell... and all while looking for missing hardware for one of the Wheatstone tables, or while pulling yet one more cable through an already-stuffed conduit.

I knew then that Jimmy Parker was to be the Third Engineer for Birmingham. He complements Second Engineer, Todd Dixon, perfectly. I have two of the best assistants anywhere.

Copper Theft

Cris told me that he was going to write about copper theft this month and use an image taken by Bob Newberry’s camera at Clear Channel’s WMJJ in Birmingham. “Magic 96” has its tower right next to WDJC’s on Red Mountain,

which is why this one particularly hit home. The thought of people running around with GUNS just to steal copper does make you pause and think, doesn’t it?

Cris says that we are going to make this a top priority nationwide, so (like many of you) we are getting quotes for cameras, alarm systems and sirens that are so loud, they’ll make any would-be thief repent before he gets clear of the premises. We have also been working with the City of Birmingham. Given that they have the police, fire and sheriff’s radio systems on our tower, they have a vested interest, too. If you can, look into that angle for your sites. An extra patrol or two in the wee hours of the night doesn’t hurt!

Parts Is Parts

Years ago, I taught electronics to technicians at a service center for the now-defunct Heilig Meyers Company in Fayetteville, NC. One of the courses that I developed was on transistor substitution. I taught

these technicians how to read transistor manuals and to make informed comparisons of types. I told them that, while it was always preferable to use the original part when feasible, there were cases where one could save both time and money with substitution.

The principle, which applies to far more than just transistors, is that many different types can often be replaced by one single “master” or “prototype” part. This was the whole theory behind the ECG (now NTE) and SK replacement series; a single well-selected transistor could replace a bunch of others in most circuits. (Don’t miss the word “most.” That’s important; more on that in a moment.)

Electronics design is always a series of compromises as one does a balancing act between cost and performance. If you work in AM, you already know one common example, the choice between vacuum caps and mica or ceramic types. Vacuums are generally the most reliable, but are also the most expensive. When building an AM array with dozens of capacitors, you have to decide what your budget will allow! Likewise, in audio circuits, Teflon capacitors are generally considered superior to the less-expensive Mylar types, but they’re gonna cost, too.

Some questions naturally arise. The most obvious would be, okay, so why are there so many different types of transistors, ICs and tubes? There are many reasons for this, some of them non-trivial. But in many cases, it’s this simple: one manufacturer develops a new chip or transistor and starts selling it. If it becomes popular, it will be cloned by other manufacturers. The clones often have different part numbers, and might offer improved performance or other features, but they’re essentially just derivatives of the original.

Here’s the secret: if you can find that one part that offers the best performance in most typical circuits, it can be used as the replacement across the board. The classic example for many years was the ECG 123A transistor, which was simply a 2N2222A (or the direct equivalent) with that number on it.

Now, having said that, unless you run a repair shop (and I wouldn’t wish that headache on anyone; there are easier ways to make a living than

arguing with some grandmother about why it would cost \$75 to fix a \$30 tape recorder!), you’re not going to be substituting transistors very often. It’s just not worth the bother. Plus – this is part of that “subs will work in *most* circuits” thing – in many cases in our line of work, the transistors are selected by the manufacturer for their particular application. MOSFETs, for example, can vary significantly from one device to the next, even from the same

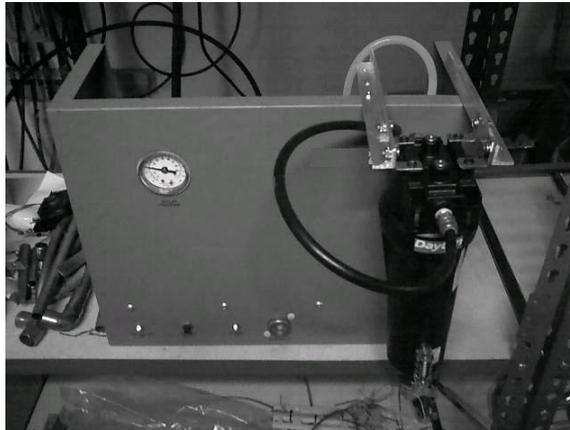
production run. The people who built your transmitter might have carefully selected them for that role. You should order these parts from them.

But there are a host of other parts and assemblies that might be worth second-sourcing. For example, many manufacturers don’t build their own power supplies anymore; they buy pre-assembled units from a separate source and just plug them into their equipment. Armed with that knowledge, you can save the company real money. We recently had

a microwave link go out; sure enough, it was one of these power supplies. To get a replacement from the manufacturer of the microwave link (Harris) would have cost several hundred dollars. With a few minutes of searching at DigiKey.com, I was able to find a drop-in replacement for less than \$90, including overnight shipping!

Here’s another example. It’s very humid here in Alabama and our dehydrators need frequent service. I obtained a price on the stuff to rebuild one of these from the manufacturer and almost passed out; it cost about half as much as a new unit just to replace the dryer cylinders! I did some head-scratching and started looking; that’s when I found that Grainger carries a nice selection of Wilkerson and Dayton dehydrator supplies that will do the job for far, far less.

What if it doesn’t fit? How can you make it look neat? This is where a trip to the hardware section at Lowe’s comes in handy. You can get angle and flat aluminum brackets, finished aluminum and brass panels, and of course, screws of all kinds, right at your local Lowe’s. The aluminum brackets are very easy to cut (the smallest can be trimmed with stout scissors or a pair of tin snips). You can make it look good, too!



Modified Andrew dehydrator uses cheap, locally-available parts

Hey, it ain't a work of art, but have a look at the finished Dehydrator modification. The Dayton desiccant cylinder is mounted on a couple of aluminum "L" brackets. Lowe's also has some nice quick-fit connectors that won't work for really high pressure, but are fine for the low pressure side of things (in other words, on the "outlet" side of the desiccant chamber, but not the inlet). Quick and easy!

The moral of this story is simple: if the manufacturer quotes what sounds like an outrageous

price for a replacement part, look for alternatives. Network with other engineers (including yours truly; feel free to contact me anytime) to see what they've done when faced with this same situation. Don't be afraid to look. At the end of the day, especially if it's a self-contained assembly like a switching power supply block, you can often find a replacement that will do as good (if not better) a job than the original for far, far less!

Until next time!

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

T1 Update

In last month's column, I detailed the problems we were having with the copper thieves hitting the Telco cable that carries our T1 from the studio to the KJSL transmitter site. This would cause us to lose audio to and from the transmitter site, thus taking us off the air, and lose transmitter control as well. In fact, we got hit two more times since the time of that writing. Fortunately, we were back on the air fairly quickly with the wireless Internet connection. We did have one time, though, where the KJSL Internet stream was down, so this system is far from being the perfect backup.

AT&T did exactly as they said they would: they only buried the four sections of the Telco cable that had been brought down by the copper thieves. The rest of the run from the KJSL transmitter site to the local utility central office is still on the poles. That is over two miles that is still very vulnerable. Needless to say we were very disappointed by this decision. We think that it's only a matter of time before we have this line hit again. Of course this takes us off the air and we lose control of our transmitter site.

With that in mind, we have decided that it is time to move from this T1 line. As I write this, the components are already arriving or are on their way for a Motorola Canopy system between the KJSL and KSTL transmitter sites. The system will include one four-foot dish and a 5.7 GHz radio installed at about 250-feet on the KSTL tower. Along with that, an

"access point" will also be installed on the KSTL tower, which essentially is another radio link between the KSTL building and the radio on the KSTL tower.

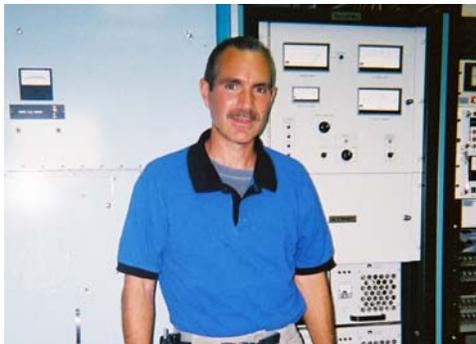
At the KJSL transmitter site, the mirror of this system will be installed on a pole on the roof of the KJSL transmitter building, but the access point will not be needed since an Ethernet cable will suffice for the short run inside the building from the pole on the roof.

When all of this is installed, it will essentially be an Ethernet cable running from the

KSTL transmitter site to the KJSL transmitter site. We will use this to transport the data traffic of the KJSL Intraplex multiplexer from the studio to the KJSL transmitter site via the KSTL Intraplex data card. The KSTL Intraplex system will stay on the current T1 supplied by the phone company.

We are stripping the KSTL Intraplex down to bare bones, basically one bi-directional audio card for KSTL program, a 3 kHz voice card for remote control connections and the data card. In order to create the room for the bandwidth needed for the KJSL Intraplex, we will expand the data card to 16 of the 24 time slots so that we have over 1 mbps of data bandwidth from the studio all the way out the KJSL transmitter site through the KSTL T1 line. This will give us room for a scaled-down KJSL Intraplex, but we'll still have room left to spare for other data services between the transmitter sites and the studio.

The KSTL T1 line is less than one mile from the local Telco central office, so there are no repeaters to go bad along the way. Additionally, the



entire stretch was replaced three years ago and we have had zero problems since that time. Also, the stretch runs primarily through heavily wooded area so it *may* be (and I use that word cautiously) less inviting to copper thieves who typically use vehicles to pull down the cable. They use rope to lasso the line and then use the vehicle to pull the rope. So for a good portion of this, they would probably need a four-wheel drive vehicle.

Now you're probably thinking, "Aren't you putting all your eggs in on basket?" Good point. We are working on finding a better wireless Internet backup solution for both sites in case the KSTL T1 goes down.

The long term and ultimate solution would be to replace the KSTL T1 with some sort of

microwave link as well. However, we would face a lot of hurdles because of the distance between the studio and the KSTL transmitter sites and the obstacles along the way through the heart of downtown St. Louis. In fact, using Google Earth, I drew a line between the studio to the KSTL tower and found that the line runs exactly through the middle of the new Busch Stadium, right across second base. A little further along the path, there is a much taller building right on the riverfront. So some sort of hop in the downtown area would be necessary for this to work.

For the short term, we are getting ready to get rid of problem child, the KJSL T1, and find a good wireless backup for the audio in case there is a problem with the KSTL T1.

Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! It is hard to believe that another month has passed and here I am writing yet another *Local Oscillator* column. Things are moving along well here at the plant and I have been extremely busy over the past month. I got our HD time alignment fine-tuned (although it was already very close), but I haven't had the time to play with our new Day Sequerra M2 as much as I would have liked to. I can tell you that the unit seems to have everything one could wish for in the area of HD monitoring and so far, I have not found anything on this unit to report negative about.

Our tower reguy project is underway (again) and so far, is going very well. The crew got towers two and three done before the Thanksgiving holiday but were forced to stop work because of fog. They did leave a piece of steel rigging rope attached to the top of tower one. That took me a while to identify since they tied it to nylon rope 60-feet down, leading me to believe the entire rope was nylon. I could not figure why our pattern parameters were so far out of whack since all I could see was two pieces of nylon rope hanging from the tower. I called my good friend Joel Saxburg over so we could investigate the issue



together. After spending some time with my binoculars scanning the tower, I noticed what looked like a preform (dead-end cable grip) next to what look like two pieces of rope tied together. Well, since a preform would not work very well on nylon rope, we concluded that the crew left a 60-foot piece of steel cable tied up at about 180-feet, thereby top-loading tower one. After checking our monitor points and discovering that were are well within tolerance, Cris filed an STA with the FCC so we can

continue to operate until that tower's reguy is completed. The tower crew is scheduled to return the first week of December and should have tower one completed in two to three days. Then it is on to tuning the array and testing our HD-R lock times, but I think that will be a non-issue as our DA parameters should remain pretty close to where they were before the reguy.

This month, I have been installing a security camera system to monitor our transmitter facility and tower field. I'm pretty sure that with all the strange goings on here, we will soon see some bizarre video. We had one such strange occurrence here over the last week. Each morning I would get up and find a

bunch of paper blowing around our tower field. Since the recent fire left most of the field black and the paper is white, it stands out pretty strongly, so I make a point to clean it up ASAP. But each time I did, I would find more the following morning. The funny thing was, none of it was anywhere around our building and there is nothing, or so I thought, behind our field for it to come from. Remember, we are located on an island and the only thing behind our tower field is Conservancy preserved land and lots of ocean, at least until you hit Hawaii. So baffled as to where all this paper was coming from, I decided to

take a little hike over the hills behind our field and there, out in the middle of nowhere, I found several black trash bags full of paper that the ravens had gotten into. I can only imagine that they were left behind by the recent marathon or by some campers that were not supposed to be there, but at least the mysterious paper situation has been solved. Just another strange island factor...

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

As I was contemplating this month's column, it suddenly occurred to me that I haven't talked about what we've actually been *doing* around here in months. Come to think of it, I know when I last did such a column, last June, when I reported on the trials and tribulations of our UPS and generator system in these pages. That one garnered some reaction from you readers, mostly a "Geez, what else could go wrong with your system?" Well, that's a question to which any answer should just as well take its time getting here, thank you very much. However, it allowed me the luxury of taking that experience and using it to add an addendum to the article I wrote way back when for *Radio World Engineering Extra*, an article which is now completely in bed and waiting for publication in either December or February.

This time, the lesson is: "The last twenty percent of the time on a project is spent when eighty percent of the work gets done." That one applies in spades to our tower projects, which started early last year and are just now getting done. You all know about why the tower projects have lagged and dragged: Catalina Island. Enough said, right? A couple of changes of tower climbing companies and a lot of paperwork later, the work is finally getting done, even as I'm writing this. In November, one of the three great months for tower work – along with December and January.

Projects such as the installation of our new LED obstruction lights, which have been waiting for a couple of months, and installation of our crow's nests, which have been waiting for over a year, and the installation of the ice bridge at Beecher, which has been waiting for about two years, all are getting done in the course of a week. Thanks to Steve Rhodes at Rhodes Tower Service, and Ed Finley at Tower Works, for coming to our rescue when things were looking bleak.

But it's still been a learning experience, particularly with regards to STL dishes. Ed Finley's crew came out early in the month and dealt with our Hammond-to-Lansing STL path, which has been low by about 25 dBm since, well, probably day one. We checked out the transmission line losses at both ends of the path and found nothing out of the ordinary there. Then we did a line sighting between the two towers. The transmitter site dish could not be seen from the studio tower at all. No, the intervening trees really did grow that much in about eleven years. From what we're seeing, moving the transmitter site dish up about 60 feet is what it's going to take. The thing is, to do that, we have to re-coordinate the STL path all over again. By the time you read this, that may have been accomplished, and Ed and crew will be out again to make that happen. All I have to say is, thank God for ISDN links. We have one at each and all of our transmitter sites, and we needed them in spades to get all this STL work



done.

Meanwhile, over at Burnham, we still have issues with the dishes there. Yes, dishes — both of them. The first assignment for Steve Rhodes and his crew was to get the newer dish (at 225 feet) aimed and the coaxial cable to the building dressed down. Seems that the previous tower crew had not done an adequate job with that. How inadequate? Well, so inadequate that the coax had moved down the tower enough to put a strain on the connection on the back of the dish. I've got the pictures to prove it. Take a look at the one below. The upshot was that the coaxial jumper had to be removed and replaced *after* the coax was properly laced down to the tower. Worse, the dish was cross-polarized to the transmitter dish, which caused a 20 dB signal loss right there. Now, that's inadequate! All of that required the wholesale removal and lowering of the dish, especially since the RF connections had been messed up to the point where extraordinary means had to be used to get them apart. With a new Superflex jumper in place and the dish rehung and in the right polarity, the signal increased at the StarLink by 30 dB, to -48 dBm, but the path *still* didn't work. So, we have two possibilities: First, the lower dish may be too low, which is unlikely since we're looking at a path of about two and a half miles with four-foot dishes and dish heights of 80 and 225 feet, or second, there is a problem in the configuration between the transmitter and receiver. Only a closed-circuit RF test at the studio will yield a real answer to that question. I'll let you know later how that turned out.

When the lower dish was, we figured, properly aimed, we did a sighting check up the tower, just to be cute, and found that the two dishes were way out of line with each other. How could that be? That required some research. Warren and I checked the relative azimuths of the two dishes, then checked the STL licenses for the azimuth information there. We even checked the plat of survey for the site. Sure enough, we concluded, the upper STL dish was over 15 degrees off line from the studio tower location. How had that thing worked all these years? Mind you, the thing had been installed, with the tower, in 1986, and it hadn't been moved in all those years. Not by human hands, at least. But the license bearing specified 158 degrees True and darned if it wasn't pointed almost dead south, about 22 degrees off!

Worse, it can't be moved. It's rusted in place. All the hardware is one big piece now. So, our tower crew had to go up the tower one more time to cut off the hardware and replace it, just so the upper dish can be re-aimed properly, so that maybe, just maybe, we can get the StarLink working properly so we can get that STL path set up for Arbitron to qualify it. That's what this is all about, you know. Oh, and getting some really 'dissed' projects wrapped up, just as the weather is getting nasty enough so that when you're done with them, you feel like you've really done something.

And Then There's the Pipeline...

Another example of a 'dissed' project has been the fencing of our tower anchors at Burnham. This time, it's the contractor and an oil pipeline that's the problem. Remember that our tower was built around 1986, and there are a total of six guy anchors holding that bad boy up. The far one on the north side is real close to the property line, but not over it, according to Cris. So be it. But, coming within a few feet of the anchor, or *just* outside our property line, is an oil company pipeline which runs from Gary, Indiana to Bolingbrook, Illinois, a distance of about thirty miles. This line is no stranger to us. About six years ago it sprang a leak right at the transmitter site property, though not at the anchor. The cleanup was a really big deal and took over a week.

Killed some of the vegetation at that corner of property, but it grew back, as weeds will. Still, the closeness of that pipeline to the anchor has the contractor spooked, and as a result, though the area around most of the anchors has been happily cleared, the fence work hasn't started anywhere as yet, although there is no such problem with the other five anchors. So, we wait, though not quietly. We cajole, but up to the point when this is being written, to little avail. We've told the contractor that running the fence right up to the point where the anchor meets the ground is quite acceptable.

Ah, were it that simple. There's another joker in that deck. To get the point of this next requires a small education in fluid mechanics and in government bureaucracy. When a fluid moves through a pipe, the friction of the fluid against the pipe walls tends to create a static charge. If left undealt with, that static charge will cause the pipe to corrode and disintegrate. For this reason, cathodic



Coaxial jumper from WPWX STL

protection on any pipeline is a must. However, and by the same token, any metal located within a few feet of that same pipeline may also absorb some of that static charge, and itself may corrode. That includes our zinc-galvanized anchor. Now, the pipeline in question is an eight-inch line buried four feet down. The guy anchor, where it enters the ground, is exactly 14 feet from the center of the pipe, which is eight inches across and buried four feet down. That means that the anchor, coming in at an angle, rather tends to get fairly close to the pipe's location as it heads down to its base, about 8-10 feet down.

To check the anchor's structural integrity means digging up the soil around it *carefully*, looking for signs of corrosion. This has to be done the entire length of the anchors, down to the concrete base. Now here's the kicker. Federal regulations require that any dig made within thirty feet of a petroleum pipeline must be done under the inspecting eye for a member of the Federal Department of Transportation. Failure to do so is punishable with a \$10,000 fine! So, bring on the red tape. It's funny how the presence of just one detail will change the whole 'red tape' picture of a project. Now, all I need is an endangered species living in the vicinity. Don't pray for that!

This Month's HD Rant

What? You didn't think there would be one? Please! There are a couple of things bothering me this month.

First: I remember working with an engineer a dozen years ago who, when faced with the results of an abject case of stupidity, would ask the question, "Well, which is it? Incompetence or sabotage? It's got to be either one or the other!" Well, this story is the perfect pretext to bring up the question.

Daimler, the automaker that didn't know what to do with Chrysler, in its infinite wisdom decided to incorporate a new car radio design, one which features a wide-band AM radio for better sound fidelity in receiving signals the AM band, I guess. In the analog mode? Didn't anyone tell them what this meant? Well, the wider IF bandwidth means that some of the HD carrier noise (as it would be in analog!) gets through, which has led to complaints... against the broadcasters transmitting in HD, wouldn't you know? Which led one major AM broadcaster to temporarily shelve the rollout of HD on its AM stations. Bad move on the car maker's part. Worse move on the broadcaster's part. May we suggest that the factory radio itself be shelved in favor of a retrofit to a nice HD radio? And, isn't

Daimler opting for satellite radio as its digital signal of choice, anyway? If you're contemplating the purchase of a Daimler product, opt out of their sound system menu and get your own aftermarket HD radio instead. These days, you can get one which will have on it whatever you want, including either CD or MP3 capability, and for a lot less money.

Second: I note with some disgust the move of one major broadcaster to take its AM HD stations off of HD at night, citing interference issues. They say that they're looking for a way to 'fix the problem' before they put the stations' HD back on at night. The thing is, that company has two 50 kW AM stations, one each in Detroit and New York, on first adjacent channels, and the claim is that the two HD signals are beating up on each other at night. As a result, *all* of that company's AM stations are HD-dark at night.

Who are they trying to kid? How are *they* going to unilaterally 'fix the problem'? By the time the AM-HD signal from the one station gets to the point where it interferes with the next 50 kW carrier on the dial, the signal of the next station is to the point where it is hardly readable anymore anyway, what with the *other* interference sources already sitting on each channel.

Face it, folks, what we have here now, in 2007 (almost 2008), is a clash of two cultures, with the technology caught in the middle. The romance of the days of distant skyway reception is almost a thing of the past. And the loss didn't start with HD Radio, so don't get caught using that tired old argument on me. The loss of skywave started in the 1960's with the breakup of the clear channels into super regionals, with big signals in the eastern U.S. co-existing with big signals on the western U.S. Heck, we've always had that issue on such channels as 1090 and 1520 kHz, where three big co-channel stations have always been the rule. Where were the complaints about interference on those channels?

Moreover, the FCC and the industry turned out to be less than stellar stewards of the AM band as a spectral resource even back then, in allowing too many signals to interfere with too many other signals because of directional arrays which were less than properly designed and maintained, but which the FCC allowed to be licensed anyway. Add to that the FCC's lax enforcement of the rules with regard to AM directionals at all, especially now, and the result is that many of the regional channels these days sound too much like what used to be called the Class IV channels – 1230, 1240 and their brethren. Just ask Cris Alexander and Ed Dulaney what they went through with KLZ on 560 kHz a couple of years back. I rest my case on that point.

And the major clears these days don't sound much better, either. I used to be able to hear all the Chicago clear channel AM stations in Detroit at night when I was growing up. Not any more. The interference is not just from other domestic AM stations with faultily designed or maintained directional antenna systems or from HD, but from other stations operating outside the US, most notably the Caribbean and maybe even South America, who could care less about our clear channels since only the 'Yankee Imperialists' would be hurt. Those folks wouldn't know what to do with a directional antenna if they had one anyway! Go through the FCC database and see how many directionals are located in Mexico or South America, or anywhere outside the U.S. Go ahead – I dare you!

Proving my point: I was in Philadelphia recently and wanted to hear a certain radio talk show which is nationally syndicated but not on any station in town. I know that the show originates in New York at the very station I mentioned a moment ago. That station is less than 100 miles away, and is located near the bottom of the band, within *ground wave* coverage of Philadelphia. I could hear the station in the daytime, clear as a bell. Not so at night. The interference from some Spanish language station was too strong. I had a hard time enjoying my broadcast. Enough said.

And then there's the alternative – the Internet. You want to hear that distant station just like you're next door? Fine. Just about every major radio station in the country, including all the clears, has streaming on line. Are you staying with Grandma for Christmas and you want to hear your local DJ from back home? Go online and listen. And you can do that for your 5 kW AM as well as your 50 kW flame-thrower, and your home town FMs too. Couldn't do that before with all the skywave in the world. So what are you all complaining about? Get a grip!

I love skywave, too, have since I was a kid. It was one of the things which cemented my love of radio. But it was only one factor. I got started with my local station, just like most of us did. And my local station had no skywave, believe me. Being there is what really made me the geek I am today.

But geeks, almost by definition, are realists, too. And realists, by definition, deal with reality. And the reality is that we don't have skywave to kick around much anymore. We have better. We have the Internet, and we have the vision which now says that the best way to serve your audience is with localism. Localism and skywave are almost mutually exclusive.

Let me give you an example: WGN, the big 50 kW flame-thrower in Chicago, has had one of the best *farm* departments in the business. It was on the air on AM 720 for over 75 years. A few years ago they took almost all the farm broadcasts off of that AM. No, they didn't dump the department. They made a sound business decision to make their AM signal's focus more local, to Chicago. Instead, they did their farm broadcasts one better. They switched them over to their satellite service, and sold that service to local radio stations in the places where the farmers were. The rural stations which carry the broadcasts have thrived with it. They didn't need WGN in the big city of Chicago to compete with them. And WGN has improved its performance as a Chicago radio station in turn. Skywave, extended groundwave, both yielded their romance to the realism of localism. And the public interest has thus been better served.

As for me, with the future of AM radio in mind, I'll take the FM-like *stereo* fidelity of AM's HD signal, over the romance and the missed words of skywave any day.

Get used to it. Grow up. End of rant. See you next month. And, don't forget whose birthday it is we're celebrating on the 25th. Please.

The Portland Report

By
John White, CBRE
Chief Engineer, CBC-Portland

Last September, we were assured that on the 14th, AM HD Radio would be turned on at night, the radio spectrum would be polluted, and the earth would spin off its axis. Some ten years ago, the United Nations and Enron raised the global warming alarm. I want to look at two aspects of that discussion as a lesson for evaluation of night AM HD-R.

My first real interest in the subject came in the form of a graph showing a constant temperature for 1,000 years followed by an uptick in temperatures since the late 1970s – the famous “hockey stick.” When I saw that graph, it just didn’t look right.

Back in college, I was required to take a class in the history of western civilization. One period between 1600 and the late 1800s was known as the “Little Ice Age” (LIA), an era that brought consequences to western civilization. The colder weather hurt agriculture and as a result, local health and economies suffered. A particularly interesting example came from church records from the northern English Isles describing prayers for protection of the local vineyards from the advancing cold.

Similarly, around the year 1000, during the higher temperatures of the “Medieval Climate Optimum” (MCO), the Vikings were able to settle Greenland and the Chinese emperor’s fleet explored the magnetic north pole. Moving westward, the Vikings established a farming settlement at the very northern tip of Newfoundland.

Simply put, the hockey stick didn’t agree with known, well-documented history. Sure enough, Steve McIntyre, a Canadian statistician, found the errors in calculating the hockey stick graph which resulted in wiping out both the MCO and LIA. Earlier this year, McIntyre also found a Y2K error in the Goddard Institute for Space Studies calculation of the US temperature record. After correcting that error, the hottest temperature turned out to be 1934 and not 1998.

For me, the point isn’t that errors happened. That’s what the scientific method is about. The lesson I took away was how McIntyre found the problems. As I understand what happened, in both cases the calculation process and computer code were withheld, and in some cases, the original data had been “discarded.” The errors were found by McIntyre after locating privately archived data and reverse engineering the calculations.

We should keep that lesson in mind as we move forward while evaluating nighttime AM HD-R. Data should never be altered or discarded and methods should be documented and open to review. Cris is documenting our observations and maintaining a history. Where possible, we should provide real measurements. The discussion ought to be based on facts, not emotion.

Based on my current observations (more detail later), I have not found a nighttime AM HD-R problem. Recently, I put together a presentation about propagation and sunspots for a local ham radio club. During the research, I noted an interesting observation which I have not seen from other sources. It is a correlation between global temperature and the sunspot number. Both the short 11-year sunspot cycle and the long-term sunspot cycle are clearly visible in the temperature record.

Most amateur radio operators are familiar with the relationship of sunspots, the 11-year solar cycle and what HF frequencies are best for long distance skip communications. I have seen several comments about Marconi’s “unfortunate” choice of MF frequencies in the present AM radio band for his 1900-1901 attempts to establish transatlantic radiotelegraph communications.

Well, the historic sunspot record starts in the late 1500s. Looking at the sunspot record for 1900-1901 (when Marconi’s work was done) shows 1901 to be an 11-year sunspot low during a long sunspot cycle low. Actually, Marconi’s frequency choice was



quite fortunate. It was not until the 1920s and 30s with higher sunspot activity that long distance skip was observed. The point here is that propagation in the AM band is not fixed, it fluctuates with solar activity. Our observations of night time AM HD-R shouldn't be based on one snapshot during the last two weeks of September.

One other comment about correlations. The sunspot record and the global temperature record correlate very nicely. The Maunder minimum (a period of essentially no sunspots) and the little ice age match nicely. I saw recently a graph showing the inverse correlation between the number of pirates and global temperature. The implication being that the disappearance of pirates caused global warming. That was until another wonk pointed out that the graph really showed that global warming was responsible for the extinction of pirates. The point is correlation is not proof of causation!

As an aside, the latest alarm sounded in the journal *New Scientist*: the astronomers have shortened the life of the universe by observing dark matter.

Here in Oregon, we now have four AMs running HD-R. Along with KKPZ, Radio Disney (1640) and Clear Channel (1190) are now running HD-R at night in Portland. Medford's KSJK 1230 is 200-plus miles distant and can't be heard in the Portland area, so I have no idea if they are running night HD-R.

My first observation is that if there is any increase in the AM band noise floor I can't hear it.

Logic says there should be, but I just don't hear it.

KKPZ on 1330 is DA-1, so there is no night pattern/power change. I didn't expect a great deal of change in the HD Radio performance between day and night. There may be some potential for degradation in HD-R reception caused by skip at 1310 or 1350. If so, I haven't seen it.

KEX on 1190 is 50 kW and DA at night. The pattern does have a deep null to the northeast, and I do see a significant HD-R reduction in that area. Otherwise, I didn't see huge day/night differences.

KDZR on 1640 is 10 kW day/1kW night, ND. Here I do see a significant change at night. Do to the power change, that's not unexpected. I find it interesting that strangely enough, the KDZR day HD-R signal seems slightly more robust than KEX's.

Looking at adjacent-channel signals, I have heard some short bursts of skip from KXOL on 1660 in Utah. Even here I didn't see a lot of interference. Mid-band AM is busy here in the Portland area, so I can't make much observation about skip into the area, but I did make two other observations relating to HD-R stations in Washington State. At the moment I do not know if either station is operating HD-R at night. If they are, I can't hear any digital sidebands. KHHO in Seattle-Tacoma is on 850 kHz. Locally, KPAM (860 kHz, 5 kW) has a tight night pattern. I did not hear any interference in the weak area of their pattern. KQNT on 590 in Spokane is located some distance away. In Portland, I am able to hear KFXD in Nampa Idaho (580) with no problem, so no observed interference there.

**Rocky Mountain "Hi"
The Denver Report**

by

**Ed Dulaney, CSRE, CBNT, AMD
Chief Engineer, CBC - Denver**

Out With the Old

December is always the month that we get rid of the last few items on the yearly "to-do" list. Unfortunately, there are some years where that list is so long that those last few items span a couple of pages!

For the most part we've had a good year here in Colorado. Things have moved forward at a good pace and we've been able to keep up with everything that needed to be repaired, replaced or retired. Those are the "three-Rs" of engineering, after all!

So this month I thought I'd take a little time to look back at some of the things that happened during the past year. But before I begin with the "old business," I want to take care of some "new business."

iTunes Tagging

One piece of exciting news that hit the HD Radio front in 2007 was the addition of *iTunes* tagging to the PAD data stream. Those that have lived in a cave somewhere in northern Pakistan might not be aware of the fact that the Apple iPod has been one of the hottest gadgets that has ever hit the marketplace. The rest of us, however, are keenly aware that the iPod and its clones have become almost as commonplace as the cell phone.

At present there are two receiver manufacturers that have hopped on the iTunes bandwagon. Polk Audio and Alpine both manufacture radios that will permit a consumer to "tag" their favorite songs that they hear on an HD Radio station. Then, the next time they sync their iPod with a computer it will allow them to effortlessly download the songs straight into their iPod. To repeat an overused cliché: "How cool is that?!?!"

In order for that to work, however, we broadcasters need to send out the proper information in our PAD that will identify the songs to the iPod. That information is sent out in a new field integrated into NexGen called the "Metadata ID". In that field

will be the Apple iTunes catalog number of each song that we play.

It's not going to be an easy task to insure that our libraries are updated with the proper information. Cris Alexander is presently working on getting the iTunes catalog database so that we can begin the process of integrating it with the NexGen automation system. By mid-month I hope to have all that information available to me.

One thing that absolutely does need to be done is a mandatory upgrade to NexGen version 2.7.4.9 or later.

This update will add the Metadata ID field to the database and permit it to be exported with the PAD stream. All station engineers that will be participating in the iTunes tagging upgrade (which is most of you!) will need to contact RCS support and schedule that upgrade ASAP. The upgrade does require that you run in Local Database mode, as they will have to upgrade the database as well as the software.

SBE Net

Those of you who are ham radio operators should take the time to jump on to the SBE net that is hosted out of Denver by Jack Roland (who many of you know as K.C. O'Brien). Jack, whose amateur callsign is KE0VH, runs the net on the first and third Saturdays of the month at 11:00am Mountain time (1800 UTC).

The project began as a simple way for a few local hams that were also in radio to gather together and share ideas. It has since blossomed into a national network, thanks to the availability of a system known as the Internet Radio Linking Project, or IRLP.

Anyone who is a licensed amateur radio operator, whether they are an SBE member or not, can join us on the network and become encouraged and educated in the latest information. All that you need to do is access your local IRLP repeater (log into <http://www.irlp.net> for a list of repeaters in your area), then navigate to the Great Lakes Reflector,



which is node #9615. Those that want to participate and need to know more can just drop me a note. I'll be happy to help you get on the air with us!

Okay. So much for the new business...

Transmitter Projects

2007 was not a real busy year for transmitter projects. The sites had very few issues, other than the usual problems with lightning and power outages. We did do an upgrade at all the sites to the latest Ibiqity software on the NE-IBOC units. That went extremely well, considering that it required a few changes to the operating parameters in order to get the HD signal back to where it needed to be.

The problems with the KLVZ (formerly KLDC) array going out of tolerance was corrected by augmenting the pattern. The problem, which was caused by some temporary cranes that have taken up permanent residence near the KLVZ site, was rather sticky to work with but everything has stayed pretty stable since the augmentation.

I think that this has been the worst year I've ever seen for weeds at our transmitter sites. KLVZ has weeds on the property that could conceal a small truck! Thanks to a rather wet winter and a few floods the ground has been very fertile. Naturally the horses and cows that graze on the KLVZ and KLTT property love the extra food that the weather has provided. But it was bad enough this year for me to request a tractor for the sites in next year's budget. Considering how much the company has to spend on people to mow the properties, having a tractor available to us will cut those costs considerably.

Station Changes

It's not unusual for station formats to change on occasion. But to have three of our four stations change formats in one year was interesting... to say the least!

It began with KLZ, which went through – not one, but two – format changes! First, we switched from ESPN radio to Sporting News Radio. Then, in the spring of 2007, we abandoned the sports format completely and went back to our roots of playing Contemporary Christian music. To me, that was a most welcome change! I'm not a sports fan at all, and it was impossible for me to relate to the sports format on the station.

Then in the late summer we swapped the formats of KLDC and KLVZ. That's not something I'd like to do ever again! It was like a Chinese fire drill on a busy highway! First, we swapped the studios. That wasn't too big an issue. Then we had to swap the actual formats around. This meant changing

NexGen audio server assignments, channel assignments on the Wheatstone consoles, processing changes, HD PAD updates (can't have KLDC displaying the "KLVZ" call letters on HD tuners!) and quite a few other things that we discovered we missed in the first go-round.

One of those missed changes was in the NexGen control room computers. I had neglected to take into consideration that the machines were specifically programmed to be the Emergency Control Rooms for the "old" stations. So when it came time to do that NexGen upgrade I spoke of earlier, I switched the two stations into ECR mode. Imaging my surprise when KLDC began playing KLVZ programming, and vice-versa!

The temporary fix was to swap the computers. But the long-term fix was to change the NexGen programming so that the computers would be the ECR for the correct control rooms. I couldn't just make that switch when we were doing the upgrade, as the computers need to download all the database and audio files for the appropriate stations before they could operate in ECR. 'Twas a lesson learned!

Staff Changes

Thankfully there weren't any changes to the engineering staff in Denver, but we saw a dramatic reduction in our staff when we abandoned the sports format on KLZ. In fact, for a month or two KLZ was literally a one-man operation. Charlie Grimes, who is the KLZ operations manager, ran the station solo. It wasn't too big a task, as the music format was completely automated and there were no live shows per se. We did have a few people helping out with the ripping of music into the NexGen system, but for a few months, I'm sure that Charlie felt like a one-armed paper hanger!

I am quite happy with the way the engineering department has come together. Amanda Alexander is certainly worth twice her weight in gold (as just being worth her weight in gold isn't enough... anyone who's seen Amanda knows that isn't a lot of weight!). And, by the time you read this, I'm sure that we will have a new ham radio operator in our ranks. She will be taking her Technician license exam at the end of November. Here's hoping that her studies have paid off, and come time for the next SBE net on IRLP she'll be amongst the rest of us there.

In With the New

I hope you'll take time to remember all the good things, and forget all the bad, that happened during 2007. And, as the dawn of 2008 shines to the

east, I will wish for you all the blessings of the Christmas season and that a prosperous New Year

will be awaiting all of us!
Until next month... press on!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

Troubleshooting

Whether you're working on a computer, a car, or a stubborn strand of Christmas lights, most problems that come up require some sort of troubleshooting. The course of action each person takes while troubleshooting is related to that person's level of experience and, in some cases, level of frustration. In many situations, troubleshooting will lead to lessons learned, thus increasing the person's experience level which will most likely make the problem easier to solve the next time around. Vicious cycle, eh?

Although I can spend this time telling you about the instances where I've quickly dissected the problem, I thought it would be more entertaining and educational to take you through one of my more frustrating experiences.

CBC-Detroit recently made the switch to a new Internet Service Provider (ISP) and I was responsible for making the network and equipment configuration changes. After some detective work by Rich Hanovich (Detroit operations manager) and myself, we were able to literally draw a picture of the current network setup and what changes needed to be made.

Our adventure began as we moved the main LAN connection to the new ISP's router. After that was complete, I worked to configure our internal router and other attached equipment. After several unsuccessful attempts to hit the Internet, we decided to back up to our original configuration, restoring the station's Internet access and allowing us to reevaluate the situation. I changed the configurations back to their original state and we reconnected the proper cables. I opened my browser to confirm we were back, but... nothing. The troubleshooting cycle had begun.

I asked Rich to double check the physical connections while I checked the configurations.



Everything looked fine and the cables were connected where they needed to be, but our Internet connection was still down. I decided to back track through the system in hopes of figuring out where the problem truly was. The configurations on my machine checked out along with those of the router. With Rich double-checking my work as I continued through the configuration menus, we hit each piece of equipment through the chain. Everything looked fine, but there was still no joy in Mudville.

At that point, I decided to call our current ISP to see, if by some fluke, the problem was on their end. After some detective work by their tech and several attempts to remotely connect to their equipment at our station, it looked as if the connection could be down.

From that point on, we played a few rounds of "try this" and "try that" with their tech support, but still no connection. The ISP's tech felt that the problem was not within their equipment, but rather was on our end and suggested I check everything again. Absolutely sure that our software configurations were correct, Rich and I decided to check our hardware and related physical connections once again. We bypassed each piece of equipment in an attempt to determine where the problem was hiding.

Our quest finally led to the connection between our back room, where the main Internet connection enters the building, and the ISP's "gateway" equipment. Thankfully, we had a long run of CAT-5 cable available and decided to bypass the potentially bad cable. There was no need to even open my browser. A flood of new email messages confirmed that we were again connected to the outside world. Lesson learned: never take any piece of equipment or cable for granted.

We decided to replace the connectors on the

The Local Oscillator
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bad cable in hopes that the problem wasn't further down the line and in the ceiling. Thankfully, that did the trick and we were back in business quickly from that point. The ISP switch was also eventually completed successfully, and it provided some

additional "learning opportunities" along the way.

On a final note, I'd like to wish everyone a safe and enjoyable Christmas with plenty of time to relax.

...until next ~~month~~...year!

The Local Oscillator
Dec 2007

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

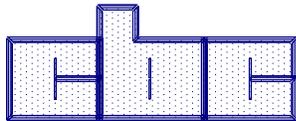
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND

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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