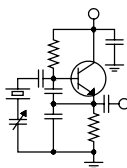


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

OCTOBER 2009 • VOLUME 20 • ISSUE 10 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR

A Tale of Two Stations

Last month, there were news items in both *Radio World Newsbytes* (online) and *Radio World* (Sept. 9 issue) about an ongoing IBOC interference issue between our KBRT(AM) in Los Angeles and Midwest Television's KFMB(AM) in San Diego. The reporting evidently came directly from a back-and-forth set of pleadings with the FCC, and to the extent of what was contained in those pleadings, the reporting was factual. However, as is so often the case, such pleadings are full of posturing and hand waving designed to paint the best overall picture for each side.

In this case in particular, the KFMB pleadings were especially *colorful*, containing certain exaggerations that would imply that KFMB's coverage is completely obliterated in some areas of Orange County. That, of course, is simply not true. Since late 2008, the power in KBRT's upper primary digital carriers has been on the order of 2.5 watts, hardly enough power to cause serious impairment to a 5 kW station with its transmitter site just over 60 miles away.

To give a little background, KBRT signed on the air on 740 kHz in 1953 from its present site on Santa Catalina Island. From there, with a water path to the mainland, the station put a 5 mV or better signal over all of Southern California, including San Diego.

In 1961, the clear channels were realigned and 540 kHz was given to the Mexicans as a Mexican clear. KFMB was at that time operating on 540 kHz. With the realignment, they had to move to some other frequency. A couple of other choices were considered – 550 and 830 kHz – and KFMB opted for 760 kHz, second-adjacent to KBRT.

As soon as KFMB made the move, interference began. For 28 years, KBRT (then KBIG) endured “monkey chatter” from KFMB even in its strongest signal areas (I remember hearing that

interference at the KBRT studios in Costa Mesa as late as 1988). Likewise, KFMB received a lot of interference from KBRT, even in San Diego. It was not until the NRSC audio standard went into effect in 1990 that bandwidth limiting quieted most (but by no means all) of the “monkey chatter” interference. Issues of desense and increased noise floor remained, however, as you would expect with such closely spaced second-adjacent channel stations.

KBRT fired up its HD Radio operation in March of 2006. For half a year, all was well. Then in October of that year, a full six months later, we began receiving interference complaints from KFMB. The allegation was that the KBRT upper primary digital carriers were interfering with KFMB in Vista, Oceanside and San Clemente, California. In March of 2007, we sent consulting engineer Joel Saxburg out to these locations with KFMB's engineer to evaluate the interference. His conclusion was that “Noise and/or digital artifacts do not seem to bother normal AM broadcast programming if they are > 20 dB below the desired program material level.” In two of the measurement locations, the D/U ratio was very close to 20 dB, so we knew that it would be possible to eliminate the noise there with a small power adjustment.

It was shortly thereafter (May) that wildfire swept across Catalina Island, and all our efforts were focused for many months on survival. We did not deal further with the interference question until the following August, when we voluntarily reduced the KBRT upper primary digital power level by 2 dB. We heard nothing further from the KFMB camp until July 31, 2008, almost a year later.

We thereafter commissioned a set of additional measurements and listening tests, and these were made by Joel Saxburg on September 27, 2008 at the same three locations. The results were very similar to what we had seen before, but weather and ground conditions were not consistent between

the two measurement sets, so the results of the 2 dB decrease were not completely evident.

At the end of 2008, we voluntarily reduced the KBRT upper primary digital carrier levels by an additional 4 dB (a total of 6 dB) for the purpose of evaluating the effect at the three KFMB measurement/listening locations. Before we had a chance to evaluate, the FCC ordered the 6 dB power reduction of the upper primary digital carriers in January 2009. Since we were already operating at -6 dB, nothing further needed to be done. Except during brief tests periods with additional power reductions, we've been at -6 dB (-36 dBc) ever since.

We appealed the January 2009 FCC order for four stated reasons: (1) It asserted a signal protection standard which is contrary to the FCC rules; (2) it ordered KBRT to reduce its IBOC operating power beyond protection standards set forth in the FCC's IBOC Order; (3) it did not adequately verify the validity of the listener complaints submitted by KFMB; and (4) it failed to reconcile or justify why KFMB's contours must be protected to any greater degree than the protection ratios establishes in 1961 when the FCC waived its contour protection rules to allow KFMB to operate on 760 kHz (and creating a great deal of otherwise impermissible overlap between the stations). To date, we are still awaiting a ruling on our petition for reconsideration.

In August 2009, KFMB brought a new interference complaint based on three new measurement locations – one in Riverside County and the other two in Orange County – and petitioned the FCC to order KBRT to turn off its IBOC carriers. Amidst hand waving and overheated rhetoric (do they teach this in law school?), KFMB argued primarily that the interference is so severe that in some protected areas (such as Irvine, CA *which is situated between KFMB's 2 mV/m and 0.5 mV/m contours*), the signal of KFMB(AM) "cannot be heard at all."

I personally went to each new measurement location with Joel Saxburg last month to assess KFMB's observations. At each location, we took a spectrum shot, measured the carrier field strength of each station and made an audio recording of KFMB.

At the first location near Sun City, we didn't observe *any* objectionable interference. I had Bill Agresta turn the KBRT digital carriers off and back on while we were at that location. Any change was lost in the background noise. KBRT's carrier field strength was 3.3 mV/m and KFMB's was 0.72 mV/m, a 13 dB ratio.

At the second location in Irvine, a "hiss" was audible from the KBRT digital carriers, but it

was far below the program level and in no way impeded the listenability of KFMB at that location. The KBRT carrier field strength at this location was 19 mV/m and KFMB's was 0.55 mV/m, a 31 dB differential.

At the third location in Costa Mesa, the situation was very similar – a "hiss" in the background with the KFMB program audio very listenable. The KBRT carrier field strength was 32 mV/m at this location; KFMB's was 1.9 mV/m (24.5 dB).

Joel and I also made some further measurements at these locations with different KBRT digital carrier power levels. That gave us a good idea of what effect further power reductions would have, both on the slight background "hiss" under KFMB at the locations where KBRT is very strong and KFMB is relatively weak, and with respect to KBRT's digital performance within the desired coverage area.

We drove all around Orange County, including Irvine and Costa Mesa, with the KBRT upper digital carriers at -6 dB with respect to the lowers and listened to KFMB. We found that the station was *entirely listenable* except where you would expect problems, beneath power lines or near large-aperture metallic structures. These observations fly in the face of KFMB's complaint that the signal of KFMB(AM) remains "completely unreceivable" at Irvine and Costa Mesa.

So where do we go from here? A few thoughts...

First, the situation is nowhere nearly as bad as KFMB paints it. KFMB is an out-of-market *San Diego* station complaining of interference in the greater Los Angeles area where it likely has few listeners anyway, an area well outside its second-adjacent protected 5 mV/m contour and even outside the AM "metro grade" 2 mV/m contour (note that all the new measurement locations in the second KFMB complaint are outside both the 5 mV/m protected contour *and* the 2 mV/m metro grade contour). Nevertheless, if I lived in the area and wanted to listen to KFMB, that wouldn't be a problem. Most folks wouldn't even notice.

Second, KBRT is operating completely within the FCC rules and particularly within the emission limitations of §73.44. The fact that some of the authorized spectrum is occupied with digital carriers is really beside the point. We are entitled to *all* of the spectrum "real estate" authorized by §73.44. If we wanted to, we could fill the RF mask up with broadband noise right up to the limits of §73.44 (-25 dBc for 10.2 to 20 kHz) and undoubtedly affect KFMB not only in Orange County but south

into San Diego County as well. Of course we do not intend to do that, but we *could* because *the law allows it*. Someone needs to pay attention to that fact.

KBRT is now operating with its upper primary digital carriers at -36 dBc. The nominal level of the digital primary carriers for KBRT is -30 dBc, even though the iBiquity spec is -28 dBc. The lower level was chosen to minimize third-order IM products at +/-25 kHz. The point here is that KBRT's upper digital primary carriers are at an even *lower* level than one might think if the nominal -28 dBc were assumed. Again, at -36 dBc, the power level of these digital carriers is about 2.5 watts.

The last thing we want to do is cause our spectrum neighbor any trouble. That's been evident in the way we have cooperated with KFMB, making two voluntary power reductions before the FCC made the order official. And we continue to cooperate with KFMB. Somewhere between where we are now and turning our IBOC carriers off altogether is a compromise we are exploring. We simply need to find out where that is.

For its part, the FCC created this mess and whether it will admit it or not at this late date, is responsible in large measure for what's going on. KFMB should never have been allowed to occupy 760 kHz when other channels were plainly available. In 1961, the second-adjacent channel prohibited overlap was 2/25 mV. KBRT's 2 mV/m contour overlaps the KFMB *site*! There was in that day no location within the KFMB 25 mV/m contour outside of the KBRT 2 mV/m contour. Likewise the KBRT *site* is within the KFMB 2 mV/m contour. The 2/25 KFMB/KBRT overlap was 100%. When the protection ratios were changed in the early 1990s to 5/5 mV, the situation didn't get much better. The KFMB *site* is within the KBRT 5 mV/m contour. While the 5/5 mV overlap is not 100%, the percentage is very high. With this degree of FCC-ordered second-adjacent overlap – IBOC or not – *what the heck do you expect?*

With the trade press attention focused on this case, the whole broadcast community is now watching, no doubt looking for the FCC to set a precedent by ruling that will thereafter be applicable across the board. But the reality is that this is a "purple cow" (to borrow the apt words of our attorney), a unique forced degree of second-adjacent overlap and seawater propagation path (all of which the FCC knew in 1961) not likely to be duplicated anywhere else. Whatever happens here is not likely to bear on any other case (are there even any similar?).

The bar to an AM spacing waiver is so high that such a waiver is almost never granted.

While our desire is for KBRT to continue to transmit in the hybrid digital mode and we are willing to assert our spectrum rights to protect that operation, we are mindful of Jesus' admonition to "do unto others..." With that in mind, we will continue to work toward a mutually acceptable solution.

HD Radio Perspectives

As I edit this month's *Local Oscillator*, I am reminded of the old story about the blind men and the elephant. You remember it... each, touching a different part of the elephant – trunk, tusks, legs, tail, had a completely different perspective.

In his column below, Brian Cunningham honestly assesses the HD Radio situation in his two markets, citing the fact that retailers do not promote or stock HD Radio receivers at all. As a result, there is no virtually no consumer demand, and broadcasters are beginning to curtail some of their costly multicast activities.

Contrast that to markets such as Detroit, Denver, Chicago and Los Angeles. Just last month, Amanda went to BestBuy and purchased two in-stock HD Radio products, the Zune-HD and the Insignia portable. While sales clerks aren't trained all that well on HD Radio products (they're not all that well trained on *any* of the products in the store in my opinion), the products are available and store personnel have some awareness of them.

So is HD Radio circling the drain as Brian seems to believe, or is it a "breakout" technology on the verge of broad consumer acceptance? I think it's a little of both – different perspectives of the elephant so to speak.

With shirt-pocket HD portables now available for the cost of dinner for three at the average restaurant, a major marketing hurdle has been cleared. The economy has certainly dealt the HD-R rollout a significant setback, but things are looking reasonably good if things recover. But in some markets – and I think Buffalo-Rochester is unique because of its social and economic ties to Canada – it's a different story altogether. This is no different that the digital television perspective between large/medium and small markets. Ask the guy in Podunk, Texas who gets his news and entertainment from a local translator if he gives a hoot about HDTV.

It's all about perspective.

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

Hello to all from Western New York! When we began our HD Radio rollout here in Buffalo-Rochester some three years ago, expectations were high that this new technology would attract new

listeners and keep current listeners from jumping to satellite radio. Broadcasters were assured that it would take a little time for the public to embrace this new technology, but once the receiver manufacturers began rolling out HD receivers, the public would wholeheartedly accept digital broadcasting for all it had to offer, including enhanced digital audio quality equivalent to CD

technology along with multiple channels of unique programming with less talk and commercial messages, traffic updates and weather alerts. Broadcast conglomerates all over the country began purchasing and installing the HD equipment with the assurance that this would evolve into the “modern era” of radio.

Currently, according to Ibiquity’s website, there are 1,936 AM and FM stations in the US presently broadcasting in HD. In New York State, there are 111 total stations listed as broadcasting in HD, of that number, 16 are AM stations. Interestingly, of the 95 FM stations listed, there are 167 HD channels being broadcast, with HD-2 and 3 channels providing everything from the Comedy Channel to NPR News/Talk, and just about every music format imaginable.

To date, I have not heard of any New York stations making a single dollar with their HD programming. And what’s even worse, the public has all but turned their back on this technology. The electronic retailers will not and do not stock the HD receivers, and worse yet, they do not even have one on a working display in the stores! It’s simple logic: they can’t sell what they don’t have, and if the consumer can’t even “test drive” in the store what HD has to offer, why *would* they be interested? Until

the electronic retailers get off their butts and stock HD-R capable receivers, we might as well turn our HD carriers off, and save the money we fork out for Ibiquity licenses, royalty fees, maintenance and

utility costs, which could save each station thousands of dollars annually!

Evidently, Clear Channel Radio gets it. Not long ago they surveyed their 340 HD-2 channels and pulled the plug on all but 46 of them due to the lack of demand. Sources within the industry state that managers and CEOs are looking seriously at the remainder of their HD-R main channels, and evaluating whether they

should remain on.

No one is certain what the future holds for HD-R. Recent operating statements for two major broadcast companies had the following statements in their annual reports;

“We are currently broadcasting 24 FM stations and two AM stations in digital, or high definition radio (HD Radio). The conversion to HD Radio will enable the stations to broadcast digital-quality sound and also provide additional services, such as on-demand traffic, weather and sports scores. Additionally, this new technology will enable each converted radio station to broadcast additional channels of programming for public, private or subscription services. The economic benefit, if any, to our stations that have converted to HD Radio currently cannot be measured. Any future economic benefit to our stations as a result of digital conversion is not known at this time.” – Regent Communications

“We also continue the rollout of HD Radio™. HD Radio utilizes digital technology that provides improved sound quality over standard analog broadcasts and also allows for the delivery of additional channels of diversified programming or data streams in each radio market. It is unclear what



impact HD Radio will have on the industry and our revenue as the availability of HD receivers, particularly in automobiles, is not widely available.”
– Saga Communications

Personally, I believe that public interest in HD-R is incapable of being revitalized. The majority of terrestrial radio listeners are now getting their local radio “fix” from the Internet, either via personal/desktop computers or iPhones. The technology for receiving this type of broadcasting is virtually free for the consumer, quality is good, and the signal can be heard wherever there is an Internet or cell phone connectivity. Programs such as Flycast, Radiolicious, AOL Radio, Pandora and Tuner are but a few that are available to the public, and sound as good as terrestrial radio. Broadcasters should be looking heavily at this method of broadcasting. The public has already embraced this technology, and auto manufacturers are looking into plug-ins that will enable the driver to attach his cell phone into the autos sound system to receive his favorite station wherever he goes. Also, Internet radios are becoming more popular, especially in sparse areas where normal aerial reception of radio signals is hindered.

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

Recently, while performing some maintenance on the WDCX-FM broadcast tower, we were required to switch from our main transmitter to the backup transmitter while the tower worker was up around our main antenna. I warmed up the aux for about fifteen minutes, hit plate on, and nothing! The transmitter had plate voltage but no current and no output. As it was getting late in the day and our programming window was quickly closing, we decided to postpone any further work until I could get the aux fixed.

The next day, I got into the transmitter and found the cause of the problem. Since I had not run this transmitter in quite some time, the filament rings on the tube had corroded enough that the filament rings were not making good contact with the tube base. In fact, the entire cavity (especially where the finger stock made contact with the cavity wall and door) was corroded to the point that a good electrical connection could not be made.

After ordering replacement finger stock for the cavity slider shelf, I began the tedious task of cleaning the cavity walls where arcing had occurred due to the poor connections. It took about six hours to



get the cleaning completed, as I had to purchase a Dremmel tool to polish up the affected areas of the cavity walls. The tube was pulled and the connection rings were carefully cleaned to insure good contact with the finger stock in the tube socket. The socket connections looked good; therefore no cleaning/polishing was needed there.

All of this work could have been avoided if I had exercised the transmitter on a monthly basis! The WDCX-FM main Continental transmitter has been so



Damaged fingerstock from the WDCX-FM aux transmitter

reliable that no need has existed to put the auxiliary on the air. With the exception of a couple of tube changes, the aux has not been up since May of 2008 when I built the transmitter site. I would advise each of you to regularly exercise your auxiliary transmitter and other backup equipment. Otherwise you stand a chance of it not working when you really need it.

In Rochester, things have been running fairly smoothly, with no major malfunctions to report on. At some point early in the month of October, WLWZ-FM will be shut down on an overnight to allow tower climbers the opportunity to work on the strobe lighting on our tower. American Tower

Systems owns the tower and has been plagued with numerous problems this year with the lighting system on this tower. While we are off the air, I will be going through the transmitters, checking and cleaning them thoroughly. I don't often get the chance to shut them down, so this presents an opportune time to get some preventive maintenance done, before the snow flies.

Kudos go out to Mark Shuttleworth in Rochester who came up with the idea of utilizing some of our old Instant Replays for backup audio should our T-1 go down between the transmitter and studio. We have a couple of units that were retired but still in good working condition. Mark suggested that we should record up to 24 hours of

music/ID's/Liners and such on the hard drive for backup purposes. In the past we have used CD players and pre-recorded CDs when problems came up with the Intraplex, which also required someone to stay at the transmitter and change out the CD's each hour. This will allow us to stay on the air for an extended period of time without having someone camp out at the transmitter site. Thanks for a great suggestion, Mark!

That about wraps up another month here in the great northeast, and until we meet again 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

Prioritizing your Workload, Keeping an Open Dialog

This month I found myself working on a diverse group of projects. Projects that not only concerned the broadcast equipment but facilities tasks as well. As a chief engineer of a broadcast facility, you need to be able to determine what you can do in house and what needs to be delegated internally or farmed out. In these very precarious economic times, I have learned you need to be flexible and resourceful when emergencies arise, and where there are limited resources, to attack them.

You may find yourself uncomfortable or unable to do some tasks due to time constraints or your scope of expertise. If you have the time to address an issue that maybe out of your realm, don't give up. Find out who in your facility may have experience in that area. I discovered that one of our production associates was a plumber in a past life. He or she can possess a great deal of knowledge and experience to help you fix the issue or, in the recent case at CBC-Detroit, perform the task faster than I could. When emergency

tasks are contained, take every opportunity to gain more knowledge in as many diverse areas as you can. This way, when the next emergency arises, you have the knowledge and experience to handle the issue yourself.



Believe me, I am not perfect, and I realize that sometimes things can be overwhelming and one can overreact to a pressured situation. One very wise person once told me, "Never stop talking, and never stop your dialog." He was making this comment about a married couple. However, I think this is analogous to the place too. Talk to your superiors (General Manager and Corporate Engineer) and internal customers. Make sure they

understand your interpretation of what you think is most important. That way, they can effectively assist you in accomplishing your tasks or guiding you as what is most important for your business or company.

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

News From The South

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

WYDE-FM – Up In Smoke!

The Atlantic hurricane season has been blessedly (and remarkably) quiet so far. We haven't had a single tropical storm; usually by October we've had a least one. However, this doesn't mean that we've escaped storms -- or storm damage.

One storm after another has rolled through Alabama in the past month. We've had days on end with no sunshine, nothing but rain and the occasional rumble of thunder. It has been extremely humid as well.

On the evening of Sunday, September 20th, WYDE-FM in Cullman finally decided that it had had enough. The station popped off air and I called Jimmy Parker, Venerable 2nd Assistant to run take a

was falling -- it looked like wet fog drifting in the breeze -- and there was lightning constantly flashing all around. I made it to Birmingham and had just

restarted our petulant mail server when Jimmy called from Cullman. He reported that the building was full of smoke and that the BE main transmitter was completely dead. The generator was running; we had lost utility power, too. Finally, the Continental was covered with moisture -- in fact, strong winds and that misty rain had coated everything on one side of the building with a slick, wet film -- so I told Jimmy to hold tight until I got there. I didn't want any more damage, nor did

I want Jimmy to get hurt.

When I arrived, Jimmy pointed out a burned spot on the back door of the transmitter, right behind the RF cavity (see figure 1). This didn't look good. We opened the door and saw that the multiplier box had catastrophically melted due to arcing (figure 2).

The transmitter was dead because one of the 200A fuses in the disconnect had opened. I replaced it and gingerly switched the AC on to begin



Figure 2 - BE FM-30T Back Door

look (Jimmy lives in the Free State of Winston, which is relatively near Cullman). He headed that way while I drove toward Birmingham to address an issue with the corporate mail server.

The weather was horrible. A misting rain



Figure 1 - BE HV multiplier box

troubleshooting. That's when I discovered that the high voltage contactor in the BE had frozen closed, so the high voltage instantly shot up to the full "unloaded" value. We had flames shooting out of the top of the transmitter. I immediately pulled the disconnect, determined that no, I would not need to change my underwear (I was inordinately proud of that one, by the way) and continued assessing the damage.

I can only surmise what happened. We apparently took a lightning strike in the interval between the generator starting and switching over, and this one pushed the high voltage in the transmitter to some extreme value. This, combined with the moist air in the building, resulted in a catastrophic arc-over. I must say that the power supply in the BE FM-30T is no slacker; it kept pumping juice into that destroyed multiplier box until the HV cable acted like a welding rod. It melted and left a fillet of molten copper and aluminum running down inside the RF cavity. Manifestly not good.

On to the Continental Aux Transmitter ...

I turned to the Continental 816-R4 auxiliary, a gift from Detroit. The WYDE-FM transmitter building is the only remaining one in our market with a "make-up" air vent to the outside. The Continental is closest to this vent; the BE is on the other end of the building. As mentioned above, the 816-R4 was covered with moisture, so we just didn't trust it. The hour was late, we weren't running any paid programming and inventory was light, and -- more worrisome -- another storm appeared to be headed in. We decided to put the BE HD-R transmitter on air in "FM Only" mode and wait for the morning. That little BE has saved our bacon in the past (if you don't know how to do this, check the manual -- it's invaluable as a last resort!). Even though we only have about 400 W of TPO in this configuration, our 1380-foot tower gives us surprisingly good coverage over Birmingham.

Todd Dixon, Intrepid Assistant #1, and yours truly headed back to Cullman on Monday morning, both to try the Continental and to finish making up a parts list for the BE. Our goal was to get the Continental on air... and we did so. We had trouble with screen overloads and experienced one or two arc-overs while we were there, so I figured the safest thing to do would be to let the Continental run with the screen breakers "off" while it finished drying out. However, I heard the Continental pop off a couple of times later that evening, so early Tuesday, I decided to head back to Cullman for another look. It had completely dried out by then, so we tried it at full

power with the screen voltage on -- only to have it completely drop out. The driver was making power, but there was no PA grid current. I pulled the tube and saw what I had dreaded: the inner filament ring on the tube socket was gone.

Oddly enough, though, only the *inner* filament ring was bad. The outer ring, aside from being a little gray with age and heating, looked fine. The good news was that we had a spare socket lying around from our former aux, an old CCA transmitter. I pulled the socket while Jimmy removed the filament ring from the spare. We installed the replacement ring... and discovered that the capacitor between the filament runs on the socket had cracked, probably during shipment. This had caused the RF currents on those filament rings to be imbalanced, probably explaining why the inner ring had gone bad. I ordered a capacitor from Continental, overnight express, and we were back on the BE HD-R unit at low power.

The capacitor came in, I installed it and to my great relief and satisfaction, the Continental came right up. In the meantime, the parts for the BE had begun trickling in (including a replacement HV contactor, of course!). As I write this, we're planning to get the BE up and running the first of next week. Anytime you have a major flame-out like this one, you want to ensure that there aren't other bad spots in the high voltage wiring; otherwise, when you try to bring it back up, you're just going to create new damage.

The biggest issue, and the one I hope to report on next time, is cutting out the damaged section of the RF cavity and brazing in a cover plate. I've used Solder-It (see www.solder-it.com) for this at Tarrant with surprisingly good results; I'm anxious to see if it will do the trick on this job. Even though we'll be brazing aluminum to aluminum, Solder-It uses a special flux that makes it easy. Better yet, it flows at relatively low temperatures (you can use a MAPP torch), reducing the risk of damage to the soft plastic parts in the BE. More on that next time, Lord willing, complete with pictures.

And Speaking of the Mail Server...

We've had more problems with the mail server of late. In every market, it seems that there are one or two employees who can't access Webmail or who have other issues. About a week and half ago, the Scalix Administration Console (the thing that we use to add or delete users) stopped working. For this and other reasons, we decided to accelerate our switchover to another mail system. Had it not been for the problems in Cullman, in fact, you'd probably

be reading about that here instead!

The system that we're looking at is Zimbra, which is owned by Yahoo!. It's a more modern and more advanced mail server than Scalix; the only negative that we've seen during testing is that the Web interface can be a little slow, but aside from that, it's extremely robust and secure. Look for an email from us in the near future warning everyone that we'll be making the switch-over. The target, barring other problems (and assuming that we get WYDE-FM happy!) will be the first weekend of October for the transition.

We plan to leave the current Scalix mail store available in "read only" mode for a few weeks after the transition so that people will have access to old email. But all new email will be processed through Zimbra once it goes online. It's high-tech and complicated, but with Todd's help, we'll gitter'done.

That's it for this time; I could ramble on further and even rant about a few things, but we'll make this one short and sweet. Until next month, God Bless you, and God Bless America!

Gateway Adventures

By

Rick Sewell, CBRE

Chief Engineer, CBC-St. Louis

As I am writing this article I am sitting in an airport concourse getting ready to take an international flight for a vacation in the Czech Republic. It's a vacation for me but a working slash vacation for my wife. She is speaking at a conference and I decided to tag along for the ride and hopefully see a few sights.

As with anyone who maintains a position where you are basically on call 24 hours a day, seven days a week, as many of us are as solo engineers for a radio station or group of stations, vacation time comes with unavoidable tension. Being human, we all need time away sometimes, without the possibility of being interrupted for a crisis back at the station. The reality is, that's often easier said than done. Even radio engineers that are working in a group environment with other engineers on staff may need to be called from time to time for their expertise on a particular piece of equipment.

The point is, there is that tension there between "truly getting away" and the obligation we feel to the 24-hour operations we leave behind. I am blessed with a good back up engineer who contracts with many of the stations here in St. Louis. I have talked with engineers who have no backup. That would be tough.

Despite having a backup engineer, there still

is that trepidation with leaving the operation behind at any time and especially this time with me being in

Europe. The cell phone doesn't work there, and the laptop air card will also not be an option there, so instant communication to get in touch with me will not be available.

In a way, that is good because as I stated above, we all need to get away with as little interruption as possible. But like most of us that are in this business, we have radio in our blood and have difficulty disengaging in the first place.

I know that on other vacations I have had a hard time resisting the temptation to log into all the computers at the transmitter sites and the studios to make sure everything is running smoothly. I guess the theory is that if I can see everything is going well, I can go enjoy myself without having to think about the stations. This, of course, can be very annoying to the family members who are vacationing with me because they just don't understand why I can't let it go for a week. All I can say is that there is a price for being dedicated, but there is also great reward.

So while I am exploring the castles of Europe, I really will try to disengage and leave it behind for the week. But I won't deny that I'll probably be on the lookout for the free WiFi hot spots along the way.



Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! I almost thought I was going to get through a month with nothing unusual to report but, the *island factor* has struck yet again.

You may remember me telling about a back injury I sustained last month while taking pictures of some damage to our roof. Well, I am glad to report that my back feels good as new, but while doing my stretches I experienced a pop sensation in my right front and later realized it was my ribs. You may recall that I sustained a very painful injury to three ribs during the Catalina wildfire and, well, it looks like they are not happy again. They seemed to be healed and were not causing me any pain or other strange sensations, but it has always got to be something it seems here.

Anyway, just as I was getting on the phone with the doctor, Todd Stickler called me from our studios and told me that the transmitter power was going all over the place. Four days prior, I caught our NE-IBOC exciter shutting down for no apparent reason. Our Nautel XL12 transmitter did as it should, switching to the B exciter. With the NE-IBOC exciter's screen blank, I hard powered it down and rebooted it. It came back up as it should, so I switched back to it. I usually reboot this exciter once a week, so I have not yet experienced anything like this where I find the screen has gone blank.

Two days after the exciter crash, I got a call from our studios saying the power was going nuts again. Since I just dealt with the NE-IBOC exciter two days prior, it was my first suspect. I switched to the B exciter and we were back at full and stable power. I decided to leave the transmitter running on the B exciter while I watched the NE-IBOC, but two days later I got a call that the transmitter is gone nuts yet again. I ran back to the transmitter room and sure enough, it was bouncing between 4kW and 8kW and was running on the B exciter.

I switched to low power and it ran as it should. I switched it back to full power and we made

a good stable 10kW again. Now I have a very bad feeling that this has nothing to do with either exciter but that once again, we are dealing with a bad control board. We have gone through this a couple times

before and even installed one board that was bad right out of the box from the factory. I'm not sure why this transmitter seems to just blow through control boards, but this is just another example of the *island factor* doing its thing here on this bizarre island. The nice thing is, I have a very solid Nautel ND10 for a back-up!

I was in quite a bit of pain as this was all happening, so I just got the situation stabilized and got this *Local Oscillator* column out, but I will be on the phone with Nautel first thing in the morning...

The Catalina Conservancy "road show" has become more and more entertaining. Since we are still dealing with all the dust, I have been waiting to see what is going to be done to remedy the situation. Well, they decided to close the road down 100% over one weekend in September, leaving me stranded at the transmitter plant. That would not have been so bad if not three days later, the crazy concoction they sprayed over the dirt already began to break apart. I guess that is to be expected, however, if you are using a bio-degradable road! Now don't get me wrong, I am very into preserving the environment, but some things are just not meant to be bio-degradable!

They sent their maintenance crew back with push-brooms and a blower to "clean off the dirt" after all this, and I had quite an entertaining evening watching the reactions of the people passing by on the tour-busses as they wonder why in the world was there a crew cleaning the dirt...

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

Left Over from Last Month.

In our last episode, I asked a question about the end of a tube's useful life. I mentioned that a tube filament was nearing the end of its useful emission when the filament voltage required to keep emission up had reached its factory ratings. What, I asked, was the other parameter which signaled the end of a tube's useful life? It's the screen voltage. At the outset of a tube's operational life, the screen voltage needed to produce the required plate current for proper output power was about half what the power supply could produce. However, once the screen voltage has 'maxed out' and power output continues to slide, then it's time to replace the tube.

Now, for this month's question, which come to us from our own Cris Alexander: What tube parameter is a good indicator of antenna tuning/VSWR in a grounded screen amplifier?

Telco Blues

Stephen Poole and I got into a little email exchange recently during which I complimented him on his writing for *The Local Oscillator*, at which he returned the favor by saying that he enjoyed mine as well, particularly my rants. So, Stephen, here goes a dilly, and this one's for you.

For those who aren't at corporate or working here at CBC-Chicago, it's a little known fact that one of the big things grinding on the company purse strings is that the Chicago stations have far and away the *highest* aggregate phone bills. Period. Honestly, folks, it just can't be helped. The city of license for our big FM (WPWX) is really Hammond, Indiana, and that's where our studios are located, but we really serve the entire Chicago area and the highest population areas of two states (and we're heard in two more), so we have to have phone lines in both states, including suburban lines, most of which are the expensive 'foreign exchange' type, not to mention what we have in the downtown Chicago sales office, our local transmitter sites, and the Rockford studio and office.

A week before this issue went to press, Cris sent us a spreadsheet with a digest of all the AT&T facilities we have in the Chicago operation. Mack

Friday and I have been trying to get this information, in this form, for years. We were almost ready to kill for it. Now we're wondering why. A look at that sheet revealed a bunch of very heavy nightmares.

We were being charged for lines which we didn't even know existed, for which we could think of no reason to have them. Several other lines were ones which we'd used years ago, knew for a fact that we'd ordered disconnected, but which were still on the active list and still being paid for dutifully by Corporate. I was stunned.

We checked one of the lines for disconnect and found that it was indeed disconnected – but we were still being billed for it. Another line, which had been ordered disconnected *at the same time* was *still active*. How did we know that we'd ordered the two lines disconnected at the same time? They had been replaced by Moseley LANLinks back in 2004. We found three lines which, in my 14 years here, I had never heard of, couldn't find a clue that they'd ever been tied to a demark, no identifying tag, no nothing, but we're still being charged for them. Obviously, we flagged Corporate to get all those lines disconnected and the billing stopped, but then we found out a dirty little secret: a business can only recoup overcharges for phone service going back six months. That's all. Everything paid to the phone company before that is now their lawful property, even if it was paid in error or due to fraudulent billing. Yes, that's what I'm calling it. That amounts to thousands of dollars from this company, at this location alone.

I swear that if it wasn't for all the money that the phone company thus steals from their customers, they'd never turn a profit. Don't even try to convince me otherwise.

What can be done about it? Several things.

First, as much as possible, get rid of AT&T as a vendor. Oh, are they a sponsor of ours? Sorry about that. Anyway, one thing we *have* done is to not



use AT&T as a vendor on any of our T-1 studio-to-transmitter links. All that is handled by an honest company, Cimco. Rockford's office phone lines are handled by Paetec. Only our DSL there is AT&T, and only because Ma Bell has the only facility in the building we can use.

Second, I truly believe that a local audit of all phone line inventory should be undertaken at least once a year, by the member of the staff who has most knowledge of the phone system in that facility. Corporate must send a spreadsheet to cover it. Here in Chicago, Mack Friday does the honors... when he can get the spreadsheet. Find out what lines are being invoiced, and if you really are using them.

Third, when a disconnect is ordered on *any* phone company line, of whatever type and for whatever reason, the person ordering the disconnect *must* get a disconnect date and a disconnect order number. Then, and this is the clincher, *that information must be filed away for future reference*. If you the customer find out later, even a year or two later, that the service which you ordered disconnected is still being billed and the line is *still* active, haul out the disconnect data for that line, and don't stop beating them over the head with it until they refund the money or issue a credit on another circuit's bill.

Fourth, it might be wise to use a phone service broker to handle your needs. Such brokers really do know the ropes in getting around the AT&T stranglehold, and he can really get you some good deals. It looks like Corporate here is starting to go that route, and I for one couldn't be happier about it. It makes little difference if the actual wires coming into your building are AT&T property and that their repair department is the one which ends up responding to your emergency call to the vendor. The big difference is that your company, thus having gone to the competition, is out from under AT&T's rip-off business practices, and that can't help but help the bottom line.

Fifth, I would suggest that we the people should lobby the FCC for a change in the tariff regarding the six month refund time limit, and end that statute of limitations. If enough of us get involved en masse to yell for just that one change, maybe we could return a few businesses to solvency again. At the very least, the six months limit should be changed to two years. I know that this would help big businesses more than it would small, but business is business, a ripoff's a ripoff, and fair is fair.

Why is this such a big deal for Engineering? Because this kind of service on our part is a good way in which we can help station ownership save some of its money; it increases our value to the

company, and it helps put an end to the whining of anyone in management who says that Engineering is only a drain on the company bottom line. Anyone who knows anything about this business should know better than that anyway; if they don't they shouldn't be in the business, and they're the ones who deserve to become the prey of Ma Bell.

Mylar Schematics

We recently ordered a complete set of schematic diagrams for our now-famous Caterpillar/Active Power flywheel UPS that we use at WPWX. It wasn't just we who wanted it, but also our local vendor's maintenance man. He doesn't have a copy of these documents either, and since each UPS under his care is different from every other unit he services, it makes more sense for us to have the schematics here. Now, these things are really expensive, something like \$140, but when we got them, we found out why. They weren't printed on paper, but rather on Mylar, and they are beautiful. And they don't wear out or die of humidly poisoning.

That gave me pause. Why couldn't everybody in this kind of business make available copies of their schematic diagrams on Mylar stock? Well, maybe they don't have to. It occurred to me that you can get the job done at a more reasonable cost just by having it done locally.

So, I called around. A friend of mine at another station here in town has had something similar done, having his paper schematics laminated at a local printer. Lamination saves the paper from exposure to air and moisture but not from excess light. I called his printer anyway and asked him about that, and about Mylar copies. He liked the idea of Mylar copies but didn't have the facility to make them. However, he did know a local printer who did. Turns out that *that* printer is just down the street from my house!

I called them. They indeed could do a job on this, and they'd get back to my with price and availability.

Next stop, the transmitter vendor — in this case, Continental. Do they have a PDF version of the schematics they can send me? This is not a trivial question, since my rig is not the latest version, but rather an 816-R4 without the 'C' on the end (We had one of those, but let's not go there.) Well, as it turned out, they do have PDF versions of such schematics, and if you will just email them with the drawing numbers of the schematics you want, they'll send you an electronic copy by return email. Newer transmitter models have it even better. With every manual for current model Broadcast Electronics equipment, for

instance, the PDF of the schematics are found on the CD ROM which comes with the manual.

Armed with all that, you can go to a printer which specializes in printing on Mylar, and order the schematics in whatever size you want, both detailed and simplified, in a form which cannot deteriorate.

Here's the contact information for my local vendor, in case you want to use them: Inland Arts and Graphics, of 14440 Edison Dr., New Lenox, Illinois 60451. They have a toll-free number: 800-437-6003. Locally, 815-485-4050. Cost? Well, I'll get back to you with that next month.

By the way, one of the projects on which Continental is working is a color version of their schematics, wherein the lines are colored differently, depending on the electrical function depicted for that line---red for high voltage, green for AC, blue for control, and so on. The old RCA BTA5-F rigs did exactly that in their schematics, and it was heaven to deal with. On the other hand, anyone who has had to follow a detailed Continental transmitter schematic knows exactly what I am talking about. The parallel lines are enough to make you cross-eyed. There is a reason that those schematics are like that. It evolved from their military contract work. The government specified that schematics diagrams for their stuff *must* be made that way, so as an efficiency move, all their schematics are like that. No wonder we who have to actually have to use the things find ourselves dependent on straight edges, or color coding or double dotting the lines ourselves, just to keep track of where a connection is really going.

I'm thinking: Once I have the prices on making these Mylarized copies, maybe I can get a set made for the other Crawford stations which use these rigs. Sounds like a plan to me.

How to Temporarily Fix a High Voltage Wire with a Hole in It

I spent a couple of days in Detroit recently with our newest CE, Joe Huk. The goal was to lessen his work load, provide some encouragement, and teach him some of the ropes on some of the equipment with which he wasn't quite so familiar. Speaking of which, James Kelly here in Chicago did a great job of teaching Joe by remote control about the Prophet system. He did it in all of about three hours – very efficient!

While the visit was really successful, we got sidetracked a couple of times with things which were not on the original to-do list but which had to be done in order to proceed with the things I'd come over to do. One item in particular merits mentioning here.

We had to take the WMUZ Nautel NV-40

main transmitter down for a factory-issued modification to cure a glitch. We couldn't keep the transmitter on the air during the process because we had a related software upgrade to go with the removal of one of the tiniest IC's I've ever seen, one on each module. This meant bringing the backup transmitter on the air.

But when we went to bring the big Continental rig up, it wouldn't stay up. The plate breaker was tripping, and the screen overload light was coming on.

Aside: I can't help but wonder about an overload on a part of a tube that's *grounded*. I know the theory of the design, folks, but it still gets me that a grounded anything can be overloaded.

Figuring out that the problem was ahead of the final, Joe and I began the process of breaking open the power supply circuits at various points and trying the system. Because misery loves company, we brought the Customer Service Department at Continental in on the procedure and they really were helpful, but we still couldn't find the problem... until Richard Garrett at Continental Field Service suggested that we just bypass an interlock, take a back door off, and look inside to find the source of the arcing.

Bingo! That did it! We found the arcing in a wiring harness going right up the inside front of the transmitter right cabinet. The wire tie there was really tight, and it had pinched the insulation on the HV wiring to the point where it just weakened and opened a hole in the middle of the insulation. That hole was about 3/32" across – a very large hole, indeed.

We didn't have enough HV wire on hand to replace this particular long run, and we didn't have the time to deal with rewiring in any event, so we did the next best thing – plumbers Teflon tape. Note that mere vinyl electrical tape will not work here, since its limit is 600 volts of electrical arc-through strength. Teflon, on the other hand, is resistant to 2000 volts per mil of thickness, just about the thickness of plumber's tape. So, about ten layers of plumber's tape around the hole is a good thickness to provide a *temporary* repair at 10,000 volts. Top that off with a couple of layers of vinyl tape to hold the thing in place, and it's a wrap. Finally, keep that part of the HV cable away from the cabinet or chassis. You're welcome.

And, don't forget to replace that entire length of HV cable, ASAP.

Hard drive in the Ibiquity Box

It's hard to remember that the BE Fsi-10 HD

generator is not designed by BE, but by Ibiquity Digital. The same, of course, is true of all competing first-generation HD digital exciters, so I'm not just picking on BE here. Anyway, it's just as tough to remember that there is actually a hard drive inside that Fsi-10 or its ilk, but then again that's first generation HD, and a lot of us folks down here have 'em, haven't needed to get inside 'em, and still don't know what's in 'em.

While in Detroit, I ran into a problem with an Fsi-10, and that's when I got my first clue about the hard drive in the Ibiquity box. I called the CSD at BE and the fellow there told me that he was suspecting hard drive problems and that I should get a new drive and just stick it in there. What kind of drive? Oh, any old IDE drive will do, as long as it has at least 20 GB on it. Snicker. They haven't made a 20 GB drive in a few years, the least you can get now is about 100 GB. No problem. All that's happening, I was told, is that, across time, the drive starts filling up with digital garbage from the processing of the HD signal, and after a while the drive runs out of room. Well, I asked, why don't we just format the drive, reload the software, and start over? For that matter, why not have a routine which automatically clears the digital garbage off the drive every so often in an orderly fashion? Well, came the answer, those drives are running 24/7, and the useful life in such service is only about two years, three at the most. Once the drives have reached that point, it's just better to pull them out and throw them away.

Okay. Maybe it's better than having the Ibiquity box crash on you in prime time, but I still think that it's a little wasteful to throw a disk drive away before its time. I'll reformat and reload, thank you.

Final Tubes – the Saga Continues

Finally, we got a 4CX15000 tube that works. It only took four tries, but the one which is in the backup rig now is working perfectly.

From what I'm being told, tolerances are so tight in those tubes that the inter-electrode capacitances can vary widely. Doesn't matter if the tube is new or rebuilt. Even the use of lasers to gauge distances has its limits, evidently. Our rebuilder, Freeland, is now keeping a record of the inter-

electrode capacitances of all the tubes they rebuild, and if they can find out which combination of those capacitances work well in your transmitter, they can send you a tube matched to your rig, and thus make your rebuilt bottle work out of the box the first time, every time. For our part, we blessed out with this last tube, but we're sending them our other, partially used tube, not for rebuild, but for electrical measurement, to make sure that they know our ideal inter-electrode capacitances, so that we get what we need from now on. It might just be worth the shipping cost both ways to get them that info to keep on file. It's also a great way for the rebuilder to keep the station as a customer.

SBE CBNT Test Enters the Twenty-First Century

I just learned from Cris Alexander that the SBE is working to modernize the CBNT exam to eliminate many of the questions having to do with the older technology such as coaxial cable based protocols, 10Base2, etc. This doesn't extend to the CertPreview study question guides that you used to get on CD, because the SBE Board has now authorized an outside firm to do an interactive, on-line study system for preparing for the Certification Exams, to replace CertPreview completely. All I can say to that is "Hooray!" Especially for the CBNT exam, that's a good piece of news with which to end this month's column, don't you think?

Finally, Payback from Channels 2 & 3 to Ham Radio Operators

Just as we were going to press, I got word through Jack Roland, KE0VH out in Colorado, that WCBS-TV in New York, rather than junking their old Channel 2 transmitter, which is a vintage 2002 Harris, is donating the RF output modules to worthy hams in their old service area. The Engineering Department came up with the idea, probably as payback to hams for all the TVI complaints they had to endure. If they're doing it, then maybe it's worth a check of all the former channel 2 and 3 TV stations to find out if they're willing to donate their RF power output modules to hams, assuming that they have transmitters which can thus be parceled out in that way. Nice news! I want one!

Until next time..... Matt. 5:16

The Portland Report

By
John White, CBRE
Chief Engineer, CBC–Portland

When is an ELF not a good Elf? Answer, when the ELF is the Earth Liberation Front.

The ELF version of an Elf is very, very much not a good Elf. Very well known in the Pacific Northwest, ELF is an all out eco-terrorist group with emphasis on the word *terrorist*. Over the years, ELF has racked up dozens of arsons and fire bombings against government facilities, forest products firms and commercial sales outlets. Racking up millions in damage over the years, ELF has not managed to kill anyone – yet.

ELF's self-appointed mission in life is to protect Mother Gaia and the enemy is evil humans, *all* humans. Well, I guess excluding a select few. Anything and everything that humans do is evil and must be stopped.

ELF's most famous participant being one Michael J. Scarpitti, a.k.a. "Tre Arrow" (pronounced Tra). Scarpitti gained fame when he spent 11 days protesting by sitting naked on a second story ledge at the Forest Service headquarters in Portland.

More recently, Scarpitti became implicated in a number of arsons and fire bombings, spending some time on the FBI's most wanted list. He was recently caught shoplifting in British Columbia, Canada and was extradited to stand trial. Scarpitti had pled guilty earlier, acknowledging he set fire to cement-mixing trucks at Ross Island Sand and Gravel Company in Portland on April 15, 2001, and logging

trucks at Schoppert Logging Company in Eagle Creek on June 1, 2001. Scarpitti's three co-defendants pled guilty in 2003 and have each

completed 41-month prison terms. Scarpitti received 78 months in federal prison for his part in the two arsons in 2001.

By now, everyone is wondering why the history lesson? Well it appears the bad ELF is back like a boomerang. On the morning of September 4th, KRKO-1380 in Snohomish, Washington (Seattle market) received a present from the bad

ELF. Early that morning the facility was broken into and a trackhoe was used to knock down two towers. The taller tower, 349 feet high, and a smaller 199-foot tower toppled.

What can you say?



[Editor's note – A September 28 AP story reports a further ELF threat to KRKO. An ELF "representative" contacted by AP responded by email that some new graffiti left on a building in Maltby, Washington was a "strong warning directed specifically to the Skotdal family" [owner of KRKO] "and the Master Builder's Association," and saying that if they "continue to threaten the health and welfare of the planet," future ELF action is "very likely."]

**Rocky Mountain Ramblings
The Denver Report**

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

T-1 Again...

The first of September, on that very day, the T-1 went down again at KLTT. I immediately dialed up the ISDN to put the station on its backup. Nothing. The ISDN would not connect more than a few seconds. I grabbed my laptop and rushed out to the site. I plugged my computer in, plugged in the audio cable that was made to feed the Omnia from a PC, connected my Blackberry to my notebook PC and got the KLTT stream up on my phone. For whatever reason, the audio level was not high enough. Qwest got out to the site and scratched their heads. The guys began tracing down the problem. After three hours of searching, they finally found that other Qwest workers working in a splice box down the street had accidentally pulled out the wires for our ISDN and T-1. It got fixed and we were finally back on the air.



stuff at the office.

We set aside some time at the end of the next day to go back out to KLTT and work on the spectrum some more. After several more hours of working, we got things looking good. Now we had a new problem. We had to set up preset 2 for nighttime operation on KLTT. We used steering diodes in the remote control wiring from the phasor to the antenna monitor and engine, but when switching the pattern from day to night, the AM-IBOC didn't switch presets.

After some investigation, we found that Nautel set up the unit inside with some diodes to keep an inexperienced engineer from sending voltage to the unit and possibly causing damage. We removed those diodes and shorted around them, plugged the AM-IBOC back in and it worked flawlessly. Now we can have digital day and night.

This is the one thing that bothers us most about the KLTT AM-IBOC installation. The old NE-IBOC could be set up so the same settings would work for both day and night on different antenna patterns. We could not find a single set of parameters with the new unit that would work with both patterns. In fact, the day and night parameters worked out to be considerably different, both DC offset and mag/phase delay.

Another thing I don't care for in the AM-IBOC and Exporter Plus is when adjusting a parameter, you have to change to the number you want, then push the check button to apply the change. With the older units, you could keep moving the number up or down and it would apply the changes as you made them so you could immediately see the effect on the spectrum or HD lock, but it would not save unless you told it to.

We also installed the new exporter and engine units at KLDC. At this site, it was much easier to get the spectrum and HD lock right than it was at KLTT – or so we thought. We got it set up and then left it to run. That night, things went wrong. It acted as if the AM-IBOC failed (no drive). We put

IBOC Exciter and Exporter Plus

After months of waiting, we received our new Nautel AM-IBOC engines and Exporter Plus exporters. KLTT and KLDC were the only two stations broadcasting with the older NE-IBOC units. We started at KLTT first. We assumed it would be an easy job, much like KLZ and KLVZ-D had been. We plugged the units in, set up the parameters we thought would be in the ballpark to get the spectrum right, but that didn't work. The spectrum was all wrong and we couldn't get a digital lock.

We began changing the magnitude phase/delay up until we got far out of the range that it should operate in. So we went down instead with the same result. Next, we changed the DC offset, looking for the lowest spectral regrowth, finally getting the ± 25 kHz IM products below -65 dBc. We have always been told that if the spectrum looks good, the HD performance will be good. We found that is not necessarily true. After several hours of working with the DC offset and mag/phase delay, we got a semi-decent HD lock. Good enough to stop for the day because it was time to go home and we still had our

the station on the aux transmitter for the night and headed out there the next morning. Sure enough, the AM-IBOC had failed. We found that the +15 volt supply as reported by the onboard diagnostics was zero (although the supply itself showed +15.0V with a DVM). We reinstalled the NE-IBOC and Nautel shipped out a new AM-IBOC a couple of days later. We got and installed it and got the spectrum looking good. After driving around and listening carefully, we pronounced the digital signal to be great!

KLVZ Night in Digital

KLVZ operates from different sites day and night. Although the nighttime Nautel J1000 transmitter is HD-ready, from the beginning, we have not operated the night site in the hybrid digital mode because of the cost of the HD generation equipment. All this changed when we upgraded the exporter and exgine at the day site. We decided to use one of the old NE-IBOC units to put the station in digital at night.

Because the J1000 is digital ready and requires no modifications for HD-R operation, we thought this would be easy. Wrong! We hooked up the NE-IBOC, set the appropriate jumpers in the transmitter, turned the transmitter on... and nothing. Some troubleshooting led us to a couple of problems. The first was the remote interface board in the J1000. It had a bad bipolar transistor, the one that amplifies the phase (drive) signal from the HD generator. The other was that the NE-IBOC was bad, either a hardware or software problem. The good news was that we had another unit to put it.

Nautel shipped a replacement remote interface board for the J1000 to us, so two days later I grabbed a different NE-IBOC and we headed out. I installed the NE-IBOC while my dad worked on the board for the J1000. We got everything set up and it was all working. We began working on the spectrum for KLVZ Night. We got it looking good and locking well in digital. We had an appointment in Aurora we had to get to, so we left. We left the night site on for a little while so we could evaluate the digital coverage. It was not good. It would only lock close to the site; once we got a mile or two away, it was very sporadic. Down south, there no lock at all. My radio wouldn't even try to lock.

The next day we headed back to the site to work on this. We worked on the DC offset, mag gain (in the J1000) and mag/phase delay and got the spectrum and lock working much better.

A Bit of Cleaning

It seems that this year, it has been hard to find time for annual cleaning of studios, transmitters, phasors and ATUs, collectively known around here as "spring cleaning" (the actual season of the year notwithstanding). So I'm going to do some "spring cleaning" in October. I started at the studios during a bit of cold weather the week of the 21st and got one production room completely cleaned. It's so hard to get into the rooms because there are always employees needing to work. I hope to get the various things at the studio cleaned the first week in October so I can finally move on to the transmitters.

Difficult Task

With a move to a new studio location scheduled for next year, one thing I need to get done is documenting all the wiring at the studios. The lease has officially been signed and this time next year, Lord willing, we'll be at a new home. We are trying to plan things out in detail so the move can be as seamless as possible. We want the stations to have as little down time as possible. We also don't want something to get wired wrong which could lead us to possible having a longer downtime, which is why I need to start documenting (my predecessor was not the best at documenting wiring, i.e. nothing much is documented!). There is a lot to do in such a short time. It actually is a bit overwhelming, but I have no doubt I will get it done.

Final Thoughts

I hope the month of October will be a good one. It will be time to get things ready for winter. We hope there will also be what we in Denver call "Rocktober." As of September 26th, the Colorado Rockies (ML baseball team) are in second place in the NL West at five games behind the LA Dodgers. However we are in first place in the race in the NL wild card race. We are mere three games in front of the Atlanta Braves. We had been worried about the San Fran Giants catching us, but not anymore – we have a comfortable lead on that team. Now it's the Braves trying to get the wild card. There are only eight games left in the regular season. I hope to be going to many post season games with my dad this year. Our first round of tickets will be at our house on September 28th. I hope we can use them. I am looking forward to "Rocktober" and all the possibilities it holds. So until next time, that's all folks!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

Doctor PC to the O.R. – Stat!

So here's the scene. I was sitting on the couch with my youngest daughter and my laptop one Saturday morning not too long ago. While we were looking through some family photos, the computer screen went black. Oddly the computer lights were still on, so I powered down and tried rebooting. Nothing... nada... zilch. A few more attempts after removing the battery and some other options brought the same results. It was obviously time to transition into troubleshooting mode and I focused on the hardware rather than considering it a software issue. It didn't take long to realize that it was definitely a hard drive problem, possibly a complete crash. Before long, my kitchen looked like a computer ICU with power cables, adapters, and small screwdrivers organized across the dining table.

A hard drive crash. No big deal, right? I could simply replace the drive, migrate all of my backed up data, and be back in business in no time. Well despite my typical position at the front of the "back up your data regularly" parade, I had become a bit relaxed in regards to my laptop and it had been well over three months since I had last backed up any data at all. Of course those backups didn't include any of the very important documents I had saved very recently. In my reasoning, the laptop is less than a year old, there's no way a hard drive that new will crash, so the data is safe ...right? WRONG! I should have known it was coming. I had planned to back up the entire computer the week prior, but put it off. Fine... lesson learned... once again.

My first plan of attack was to try and access the hard drive using a USB adapter and my wife's computer. After two unsuccessful attempts, it quickly became obvious that the drive wasn't spinning at all. If there was any hope of getting the data off of the drive without paying \$2000+ for some tech "surgeon" to remove the drive platter, I'd have to get

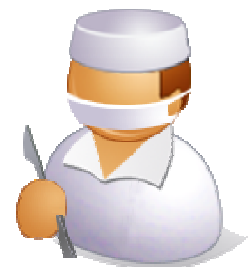
the hard drive spinning and I had two options. The first would consist of purchasing another identical hard drive and replacing the logic board, if that's where the problem was.

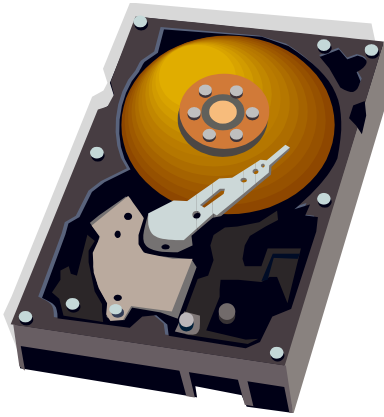
Before spending the time and effort to do that – and running the risk of ruining the drive in the process – I decided to try another method that had worked once before and was less invasive. I would throw the hard drive in the freezer for a couple of hours and see if that would do the trick. Yes, you read that

correctly and it does work sometimes. Simply putting a hard drive in a static-free bag, such as the one that a hard drive comes in when purchased separately, then in a zip lock bag, and finally putting it in the freezer seems to bring hard drives back to life occasionally. It also has the potential of damaging the drive further, but is much less a possibility than other methods.

I honestly don't know why it works, but I have heard several theories. One example is that the cold temperature contracts soldered joints that may have expanded over time due to heat. Although I did take some electronics classes back in high school, I'm far from being an electrical engineer and I'm not even going to begin trying to prove or disprove that theory. I simply know this process has saved my rear once before.

After about two hours of spending time with some frozen veggies and burger patties, I put the hard drive back into the laptop. It still wouldn't boot up, but I could now hear that it was spinning and showing some progress. I was also quite pleased that I wouldn't need to replace the logic board.





Unsure of how much operating time this crippled hard drive had remaining, I decided to skip the external adapters and install it straight into my desktop. With IDE drives, you can

simply move the jumpers to designate the drive as a slave and boot it up. Unfortunately that's not the case with a SATA drive and doing so would require a complete format of the drive. Needless to say, I was not about to do that and the desktop would not boot up with the drive attached. The good news was that the desktop was recognizing the drive as available via the BIOS screen, so I had confirmed that it was at least working.

Plan "B" was to use the desktop's power supply to power the drive and use an external USB adapter to connect the drive. Thankfully, that worked like a charm and I could access some of the data directly. The new obstacle was that the vast majority of the data was either corrupted or inaccessible due to some other reason. Of course, this was the important data that I really couldn't afford to lose. After a very frustrating hour trying to access that area of the drive, I turned to the World Wide Web for some answers.

I found numerous data recovery software applications available, many of which offering free demo downloads. Despite my efforts, nothing seemed able to access that area of the drive. I was just about ready to accept the fact that the elusive data was gone forever when I came across GetDataBack (www.runtime.org). I read through the company's claims about their software and, quite honestly, they seemed way too good to be true. Without any other option, I downloaded the demo which promised to find the data for free. Once the data was found, actually retrieving the data would cost \$79 for the full license of the software.

It took about 30 to 40 minutes for the software to scan the drive and do its magic. At the end of the scan, I could navigate the directories of the hard drive similar to how the explore feature works in Windows. After registering the software, I was then able to copy any data I wanted to the desktop computer, which included the files I thought were gone forever.

Approximately 8 hours after the drive had crashed, give or take a few minutes for my happy dance once I realized that my files were okay, I had successfully backed up the lost data onto my desktop computer. Although hard drive crashes are never pleasant, this instance ended much better than I initially expected.

This was actually the fourth hard drive crash I've dealt with this year. Two were on my home computers and two were at work. I've said it before and I'll say it again; it's not a case of *if* a drive will crash, it's *when* it will crash. Thankfully, the other three crashes involved data that was adequately and recently backed up. Although reinstallation of the operating system and any software that is used on a regular basis can be time consuming, it's truly not the stressful part. In fact, a clean install can at times, provided it's planned ahead of time, be a positive step in getting your computer to run "like new" again. The frustrating part is sifting through your backed up data, whether it's recent or not, and determine if it's important to save or can be released to its cyber after life.

So I suppose the moral of the story is that crashes will happen, but the important thing to remember is not to panic. If you back up your data frequently, there is very little to worry about unless the 50-page report due in two days that you've been working on since your last back-up was one of the items lost. Even in that case, with computer techs charging \$99 just to look at a hard drive and then \$1000+ to recover data, panicking can end up being costly. Take a deep breath, cry if you must, and review your options. Hopefully your situation will never result in putting your hard drive in the freezer. But if it does, make sure to always stock up on some good ice cream to enjoy while you're waiting.

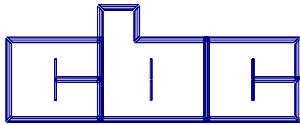
...until next month!

The Local Oscillator
October 2009

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
KLWZ • 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
WLWZ-FM • Webster - Rochester, NY
102.7 MHz, 6 kW/100m AAT
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT
WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT
WYRB • Genoa - Rockford, IL
106.3 MHz, 6 kW/65m AAT
WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41 W-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



Corporate Engineering
2150 W. 29th Ave., Suite 300
Denver, CO 80211

email address: crisa@crawfordbroadcasting.com