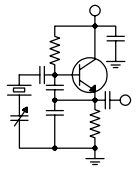
The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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This Changes Everything

Late last month, the FCC enacted new technical rules regarding the verification of AM directional arrays. The new rules make it possible to forego the traditional directional proof of performance, instead allowing engineers to carefully model their arrays using method-of-moments techniques, determine the current moments in the towers and from that, determine the currents and phases required to produce the pattern. The sample system is then carefully calibrated for phase (equal phase shift in all lines and linear phase response in the sampling devices) and amplitude (equal loss in all lines and linear amplitude response in the sampling devices). The array parameters are then carefully adjusted to the model-determined operating parameters, and the array is then presumed to be producing the correct radiation pattern.

These new rules are the result of the work of a coalition of engineers, mostly group directors of engineering and consulting engineers, over a number of years. Consulting engineer Ben Dawson reminded me that the initial proposal was filed in December of 1989, making this a 19-year effort! The wheels at the FCC do grind slowly. I have little doubt that were it not for the hard work and lobbying efforts of the coalition, these new rules would have never come to be.

But there remains a good bit of misinformation out there, a general misunderstanding of what the rules require and allow despite the excellent coverage of the topic in the trade press over the past year. Allow me to put some of this to rest.

First, as I understand the new rules, the traditional proof employing close-in and far-field electric field strength measurements, will still be allowed and will, in fact, remain as the final authority as to the proper shape and size of a directional pattern. If there is a question of interference, if a protected station believes that the protecting station has an issue with its directional pattern that is permitting the interference, traditional proof measurements will be used to settle the matter one way or the other.

All directional stations that would otherwise require a proof, partial or full, will have the option of performing traditional proof measurements or employing a model. Some engineers will no doubt be more comfortable with the old method. Perhaps they just enjoy walking and driving while lugging a field meter around. Stations that use traditional proof measurements to establish the proper shape and size of their patterns will still have licensed monitor points that must be periodically checked and maintained.

Engineers who wish to employ the model method can go that route. The advantages are numerous:

- No “trial and error” to establish proper pattern shape
- Array tuneup in days or hours instead of months or weeks
- Nearby reradiators are encompassed within the model
- Monitor point selection, checking and maintenance are not required
- Seasonal variation in monitor point field strengths are no factor
- Pattern shape is based on a mathematical model rather than faulty magnetic measurements of an electric field
- Variables such as reradiating objects, local field disturbances and varying conductivity/dielectric constant are eliminated

Stations that employ the model method must

verify the performance of their sampling systems every 24 months. The purpose of this is to eliminate the possibility of chasing a bad or changing sample with phasor controls and thus altering the directional pattern shape. In a traditionally-proofed array, monitor point field strengths would presumably alert the engineer to such a problem. In a modeled array, the test equipment (sample system) used to maintain the array parameters must periodically be calibrated.

One part of the proposal that was not acted on was that part dealing with reradiating structures. Until now, only certain antenna structures had to protect AM directional arrays. Part 90 (Public Safety) licensees, for example, currently have no requirement to protect AM arrays. In Portland, a Part 90 licensee built a sizeable tower very near the KKPZ array, and it reradiates like crazy. The licensee, a governmental entity, essentially thumbed its nose at us when we asked them to detune their tower. Our proposal would have made AM array protection universal. I understand that this part of the proposal is not dead but will be dealt with separately. A "Further Notice of Proposed Rulemaking," which seeks to put AM array by nearby antenna structures universal, proposes a new Part 17 (ASR) rule to that end. Stay tuned.

So what does all this mean for the industry? As I mentioned above, it means that we have more choices. We can either proof our arrays or model them. CBC has at least two array projects in the queue that would have required proofs in the next three years. This means that we won't be doing walk-ins or drive-ins for those projects. It also means that for some of our existing arrays that have seasonal variations in monitor points relicensed under the new rules and stop worrying about the MPs. KKPZ in Portland can do the same thing and get out from under the STA that it has been operating under for the past several years.

To borrow an iPhone advertising phrase, "this changes everything." It's been a long time coming. My hat is off to my fellow Coalition members who worked so hard to make it happen.

Getting Worse

The last thing I wanted to write about in these pages again is copper theft, but here we are. Last month, we got hit at Red Mountain (Birmingham) once, at Ruby Hill (Denver) twice and at KLZ (Denver) twice. In the Red Mountain episode, the copper thieves did not get anything of ours, but instead took some copper from our tenant, the City of Birmingham. At Ruby Hill, part of the ground ring at the tower base, parts of numerous radials and a good bit of strap was taken. At KLZ, they broke into the barn (yes, the freshly painted one) by cutting off the locks, trashing the interior and taking some old transmission line pieces and parts.

Folks, this is getting worse, and it's everywhere. In many locales, we have already taken a good number of preventive steps, but still they come. And worse, law enforcement is powerless or unwilling to stop them. It seems that their priority is forcing property owners to clean up graffiti, not protecting property.

If you haven't already done so, take a hard look at your transmitter site for vulnerabilities. The time to beef up security is not after copper thieves have ripped out your ground system.

Changes

Many of you already know of the departure of Ed Dulaney after a 12-year tenure as chief engineer of CBC-Denver. Ed is leaving to start his own contracting business, a venture we are certain will succeed. We wish Ed all the best and look forward to seeing him from time to time.

Ed's departure leaves a significant void in the engineering structure of CBC-Colorado. I have wrestled with the decision of how best to fill this void. The fact is that we have a considerable investment in Amanda, who has been the engineering assistant in the cluster since April of 2006. In that time, she has worked alongside Ed, soaking up a lot of knowledge and developing many new skills. She has also graduated from CIE's Broadcast Engineering program and obtained SBE certification. In short, we have invested 2½ years in her training and development as a professional broadcast engineer, and I believe it is time to recoup some of that investment.

Effective October 4, Amanda will assume the title of Acting Chief Engineer of CBC-Denver. Between then and the end of 2008, we will observe her, assisting where necessary as she assumes full responsibility for the rather complex technical operation of the cluster. I have every expectation that she will do well.

I look to the other engineers in our company to help Amanda succeed. She has been instructed to call upon any of you as needed to glean knowledge and draw upon your considerable expertise.

Remember the first time you flew solo, and do all you can to assist her. With your help, I know she will succeed.

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

Hello to all from Western New York! My wife and I, each year at the first full week of September, take a weeklong trip to Gettysburg to recharge the batteries and spend some precious time together. I have been all over the United States, but I have not found any area that revives me as much as Gettysburg does. You would think that after 15 years of vacationing to the same place, it would get boring, but each time we go, we find new and interesting places to go and things to do. This year's trip was exceptionally relaxing, as I was virtually "burned out" both emotionally and physically.

The rigors of our jobs can be highly demanding on our time and emotions, and just being able to get away from the day-to-day job activities and truly relax is a necessity. I returned to work from this year's vacation with a fresh attitude and a whole new outlook on my job – and the need to go on a diet, as we ate way too much (I guess those nightly walks to the ice cream shop didn't help matters either!). We are already planning and looking forward to next year's visit to Gettysburg, a place we like to call our home away from home.

I have an engineer friend that travels the country performing directional AM array work, and each year, would take his family along with him to some out of the way place. He looks at it this way: he gets the job done for the customer, and his family gets to see an area of the country they have not seen before, and for free! He states that he has not taken a vacation in the past ten years that didn't have a tower at the end of it. Now, that's a bit excessive!

WDCX – FM Buffalo

Beginning September 1st of this year, the AM station in Rochester officially became "WDCX" and our FM with the same callsign in Buffalo became "WDCX-FM." Plans are for the programming of the former Legends station to closely emulate its namesake station in Buffalo. The programming will include many of the teaching programs now heard on WDCX-FM along with the Dave Ramsey Show and the locally produced Neil Boron – Live.

We had planned to send our local programming from Buffalo to Rochester via ISDN, but after we stopped airing the daily Paul McGuire show from California, our ISDN long distance service was cancelled with Sprint. I called our representative with Sprint to reestablish our long distance service, but they stated that they were no longer accepting any new customers for their switched long distance. I then called Verizon to obtain the service through them. After about two weeks of no ISDN long distance service, Verizon told us that they couldn't handle long distance data service that we would need to find another provider. Well, I called MCI, but they have now merged with Verizon, so they were out. I next called AT&T (four times) but they would not even return my calls.

Frustrated, I called some of the other stations here in Buffalo to find out who provided their switched long distance service for ISDN. All reported that they were using a company out of New Jersey called Zone Telecom. I have contracted with them to provide the service, and it should be up and running by the end of the month. Until then, any local programming we want Rochester to air is being sent via the Comrex Matrix.

WDCX / WLGZ – Rochester

There is not a lot to report on from the Rochester stations. The Legends format is doing well on the FM station, and sounds excellent in both analog and HD. No changes were made in the HD-2 channel, as that continues to play Christian music as before.

There is still a lot of work that I need to get completed at the AM transmitter site but have been unable to get accomplished because of the unusually

wet weather we have had this summer. The tower painting at the WDCX transmitter site was scheduled to be done this summer, but that project is going to have to wait until next year. All of the tower crews are way behind in getting their scheduled tower work done because of the rain. The wood trim and soffit on the exterior of the tuning houses still need to be painted along with the exterior doors. Hopefully I can get this done before the first snow flies.

After a recent thunderstorm, we lost one of the RF modules in our Nautel ND-5 transmitter. I pulled the faulty quad out and replaced the bad module with our spare, only to find out that it also was bad. I called Nautel and ordered a replacement module under their exchange program to get us back on the air at licensed power. After installing the new module, I sent the exchange one back, along with our spare for repair. We do not have a spare parts kit for the new RF modules which were replaced when I modified the transmitter for HD-R service, so in-house repairs cannot be made at this time.

That about wraps up another month here in the great Northeast. Until we meet again here in the pages of *The Local Oscillator*, be well and happy engineering!

The Motown Update

By
Tom Gardull, CBRE
Chief Engineer, CBC–Detroit

Disaster recovery was on my mind recently. Oh, we had no massive disaster to deal with yet, just the normal problems. But I think about it and try to forward-plan. WMUZ had some new telephone problems recently whereby all 24 dial-tone numbers coming into our building on T1 trunk #1 would drop-out for a few seconds, dropping any callers. I was able to use call-forwarding to move our main on-air talk number over to the working backup trunk-hunt group on T1 trunk #2 during a testing outage. Having spare numbers on the new second T1 based service gave us some flexibility. I did not have spare paths into our PBX, so we could have problems if we lose the T1 for any length of time.

Telephones are important for the business operation and on-air talk programming, but there are other possible choke points that might keep us off the air. Certainly, given enough time, I could always rewire an entire system, but what happens if something major fails at 6:00 AM? If our Wheatstone bridge router system goes haywire, it could take everything away. Each transmitter feed has a Broadcast Tools switcher, which chooses between an AES-sourced output from each studio's delay unit thru the Wheatstone system or a direct output from a NexGen mix channel converted to AES. This does not help with live programs, but it would keep something recorded on-air.

Our audio paths to the transmitters have some backup. WEXL and WRDT-day have backup ISDN that must be remotely switched. All our backup scenarios require human intervention to decide when to use them. Some people will understand what to switch if I am not there, others might get confused. There are so many possibilities of where the breakdown point is, and that dictates what backup response is needed

I was recently thinking about how to make a temporary live studio for our "Z2" HD-2 station, which is normally a direct feed from NexGen. It led me to consider how I could use an on-air studio for two different stations simultaneously. Our Wheatstone is flexible with multiple program busses. WRDT is 90% fed from NexGen and almost never live. I could have WRDT audio on the main program buss, and "Z2" on the auxiliary buss. Or, it occurred to me, have a Wheatstone "salvo" set up to transfer the FM or WEXL or "Z2" over to the WRDT studio for that 6:00 AM emergency at the touch of a single button.

We used to consider one of the production rooms as the backup air facility, but the AES digital paths have made that option obsolete because of

analog production consoles. Wheatstone is the choke point now. I could not quickly move three stations into analog production rooms if the entire AES-based Wheatstone shuts down. It would take a while to setup A/D converters and establish new NexGen audio paths. But we have the equipment.

We have the standard backup equipment such as power generators and auxiliary transmitters. That was all that was needed not too long ago. In our new digital audio world, I believe we all will build up AES equipment inventories in the future. Just as retired CRL processors eventually found new use on Internet streams, retiring AES processors will give us backup equipment for all the audio.

I have thought about the major catastrophic failure. I have a plan. Some of the plan can be implemented now and some has to wait until the day of the major failure and its unique situation. But I know where to start if that day ever happens.

News From The South

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

Gas Shortages (Thanks, Ike!) and Wall Street

Sandy and I just completed another trip, this time to Winston-Salem, NC. We had chosen the route with care, given that there are gas shortages in the South due to Hurricane Ike. When we got to Chattanooga and tried to fill up, we kept running across pumps with bags over the nozzles -- the universal symbol for "no gas!" in the South. We finally found some fuel near Cleveland, TN and continued northward.

To protect the guilty, I won't name the place at which we spent the night in Tennessee. I'll only note that it was near Alcoa, home of the eponymous aluminum plant. After interfacing with the locals, I wondered if perhaps the dust from said plant had ... well ... *affected* them in some way. The area itself is beautiful and the people are friendly ... but weird. Of course, once you go further into the sticks beyond, things get weirder and more Southern. Even the dogs have two names around there. No one is simply "John" or "Eileen," they're "John Bob" and "Mary Eileen" (and the dog, of course, is "Willy Rover").

We had been warned that Asheville, NC was experiencing major shortages, so we filled up before crossing the Tennessee border into North Carolina. There was plenty of gas in the Pigeon Forge area, but we were unable to find gas again until we reached the huge and happy metropolis of Icard, NC, about an hour from Winston-Salem. We only had to wait in line for about 15 minutes.

For an old guy like me, this naturally raised memories of the 70s and the gas lines that we had to endure back then. When coupled with the bad news from Wall Street, it does make you wonder about the future, doesn't it? But I have two thoughts on that: first, God is still in control and I'll just trust Him for my bread; and second, if the politicians would stop trying to blame one another and just make an honest attempt to fix things, we'd be better off.

You'll find no shortage of opinion about the meltdown and who's to blame. The fact is, both Republicans and Democrats are equally guilty. It's true that the government, since long before the current administration, has been pressuring lenders to make home loans to low-income buyers. It's also true that the lenders had to go to Wall Street for that money, and the only way that they could get it was by presenting variable rate mortgages to the investors. It's also true that SEC oversight of these ponzi schemes was woefully inadequate and that the CEOs of these mortgage companies, seeing the coming crash, just cashed out their chips and ran with millions of dollars before the ship sank. On and on it goes. No one person or thing is to blame, unless you call it by its most basic name: greed. Not just greed for money, but power-greedy politicians who

deliberately looked the other way when bad loans were made so that they could crow about rising home ownership. Again: on and on it goes.

The only thing that concerns me is public confidence. Those who should know, including my own brother Scott, who's a financial wizard, say that the fundamentals remain sound. Scotty said that his sales have been up by double digits – in fact, he's having trouble getting product to sell. The problem is that the manufacturers are starting to believe all the stuff about a "slowdown" and have cut back. Once again, I'll just leave it in God's hands and get on with my job.

The State of HD-R

We took the pickup with the Kenwood on this trip, so we were able to listen for HD-R on the way. It's still hard to find in the smaller markets; most stations haven't converted yet. But even worse, among those who have, there's a very real problem with it not being adjusted or implemented properly.

106.9 "The Light" in Asheville, for example, was in HD, but the PAD wasn't working. My radio just scrolled a blank line. A station in Knoxville hadn't bothered to set the diversity delay, so we got the ol' "time warp" effect in the fringes – it sounded like a CD skipping, or like a crazed monkey was smashing the "Dump" button on a digital delay at random as the signal came and went.

The PAD thing was an annoyance, but the latter was a true killer. We have got to get the word out to any station implementing HD-R that failing to set the analog delay is just unacceptable. If nothing else, they could just manually set it to about 7.9 seconds and fine tune it later with a compatible receiver. Failing to at least set that "rough" delay will make people return their radios for a refund. Believe me, it will kill HD before it ever gets off the ground. It would also help if the receiver manufacturers would include a way to switch off the HD on marginal broadcasts.

In the larger markets (Winston-Salem, for example), things sounded better and I heard some really interesting second channel programming. There were still issues, though. One common mistake was for the PAD to be way out of sync with the program – for example, the next song title and artist might appear a minute or more before the song actually started playing.

I'll let others address the marketing of HD-R and raising public awareness of it. Speaking as an engineer looking solely at the practical issues, there are still problems that we need to address. I know that a typical large market engineer has to handle several stations now, and that it's easy to put these things onto the back burner. With shrinking budgets, management expects us to do more and more with less and less help. But these issues will be part of what makes or breaks HD-R, so we need to take the (relatively brief) time required to ensure that these things are done right. They should be part of routine weekly maintenance chores.

Small markets have additional concerns. It's very difficult to get disparate (and often old) systems to play nicely together. For example, a station might have an automation that doesn't transmit PAD, or might play music straight from CD. Where does the PAD come from in that case? I'm not aware of a single CD player that outputs PAD. Did no one think of these things? Basically, we're not only asking small-market stations to come up with the money for the HD-R system itself, but to upgrade their studios and their automation system as well. No wonder so few have bothered to convert thus far.

Another problem, well-covered in the trade press, is coverage area (or the lack thereof). While the newest generation of radios really is helping, HD-R is still too easily knocked out by a hill or other obstruction that won't affect the main analog signal. It may be mathematically provable that a digital signal at -20db can *theoretically* provide the same coverage as comparable analog, but that ignores the fact that there's a bare-minimum signal required in any real-life receiver to overcome inherent noise. Put in simpler terms, even if the same *ratio* of HD-R to analog penetrates an office wall, it's possible that the HD-R signal strength will be below the receiver's noise threshold. The listener will be able to get a scratchy, mono analog signal in the office, but not the HD ... and all he or she cares about is that the radio doesn't seem to be working correctly. Hey, they can get song title and artist info in their car, so why not in the office, too?

I'm still a big fan and booster of HD-R, but I'm not blind to these realities. The proposed HD-R power increase will help, but we've got to look at interference on that and it's not likely to happen anytime soon. Once again, I don't have all the answers, but I hope that we're at least trying to address these issues.

GNU/Linux Revisited: SuSE 11.0

I recently upgraded to the latest release of the OpenSuSE distribution. I started with them at 9.0; they're now up to 11.0 and the improvements continue. Ironically, this time I had trouble with my home desktop computer – more on this in a moment – but my company laptop upgraded very easily and

with flying colors. Best of all, wireless networking now works seamlessly. I had the laptop with me on the road, and at the motel near Alcoa, SuSE was able to find the wireless network and bring it up with a mouse click.

Sure, it's a comment on Linux that this – something that has been taken for granted in Windows for many years – is noteworthy. But the fact that the latest Linux distributions are able to do wireless networking is very encouraging. Linux is far more secure than Windows for Web and email, so I much prefer to use it for that. I've written about this in detail in the past, so I won't cover it again here, but the biggest reason is that Linux is a clone of Unix, which was designed for large enterprise systems and was then scaled down to personal computers. Windows, on the other hand, has its legacy in personal computers and was scaled up for the enterprise. Security was built into Linux from the ground up and almost from day one.

My home computer, which has a 64-bit AMD processor with NVidia graphics on board, didn't fare quite so well. The problem isn't necessarily with Linux itself, it's with the proprietary software required to get 3D video acceleration; a Web search revealed that there are known issues with this, especially on 64-bit systems. In my case, it worked fine at first, but as soon as I updated the kernel with the latest security patches, the video stopped working entirely. All I could get was a text mode screen. I didn't have time to fool with it, so I just backed off to SuSE 10.2 for now.

All in all, I am still 100% sold on Linux. Everything I need or want to do, with a few specific exceptions (such as income tax software), I can do under Linux now. I actually prefer the KDE desktop to Windows; it's much more cleanly laid out and has a number of features that even Windows Vista has yet to incorporate (such as multiple desktops, which is one of those things that you can't live without once you've gotten used to it). I've said this here before, too – if you haven't tried it yet, you don't know what you're missing. And best of all, it's free. You can download the complete operating environment, complete with desktop software, from www.opensuse.org.

More Copper Theft

After a relatively quiet half year, copper theft is again on the rise at the transmitter sites around here. Bob Newberry's Clear Channel site on Red Mountain, right next door to our WDJC's, has been hit more than once in the past month. Each time, the thieves climb the fence, avoid the cameras (or wear masks), hit and then run. These images, from Bob's surveillance camera at the site, shows the thief grabbing some ground wires and then scooting long before the police could arrive. The alarm didn't deter him. The cameras didn't concern him. It's a real problem, and aside from physically posting a live guard up there, we're limited in what we can do.

The Birmingham police have been very helpful and have caught one thief in the past month, but that only helped for about two weeks. Another crook has already taken his place. We've covered this before, too: the thieves know that tower sites represent a rich source of copper and aluminum that can be had for very little effort and with very little likelihood of getting caught. The only way that they're being caught, in fact, is via deliberate traps set by the police. Unfortunately, the police don't have unlimited resources, so you'll be hit once or twice before they'll even think about setting up a trap.

We're about as secure as we can be here in Birmingham. Once again, the most effective thing that we've found is an electric fence around the copper, but given the liability issues, some station owners balk at this. Securing the site will help, but once again, the real answer will be to lobby for

uniform laws that require photo ID from anyone selling scrap metal. The scrap yards will scream about this, but it's the only way. I urge you guys to write everyone from your congresscritter on down about the problem, urging them to pass real laws requiring controls on scrap metal sales. Until we do, the problem will just continue.

That's it for this time!

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

This past month, we had problems with the KJSL day pattern. The parameters were shifting considerably. These shifts would occur throughout the day and seemed to move with the rise in temperature throughout the day. We would also have some shifting occur when there were changes to weather from rainy to dry conditions.

The first thing I needed to eliminate was that it was not a problem with the monitoring system. It could be that there was no actual shifting of the antenna parameters but just false shifts due to something going wrong in the monitoring system. So it would be useless to chase down a problem in the tuning networks if the actual problem was in the monitoring system.

Being that the monitoring system was only in place for six years, I was kind of doubtful that this was where the problem was occurring, but it did need to be eliminated. I started by checking all the cable connections to the antenna monitor and then to the toroidal current transformer (TCT) in each of the doghouses.

All of this looked good, so I was fairly confident of the problem lying elsewhere. Still, there was a good way to check this, and that was to use the RF ammeter to track the actual base currents at the towers. I put this in line at the base of tower number two, the reference tower. I then took the base current reading and waited for an actual shift of the parameters again.

I didn't have to wait long. When I saw that they had shifted, I drove back out to the transmitter site and checked the base current reading with the RF ammeter at the base of tower two. There was indeed a shift of the base current with the shift in parameters. This definitely meant there was a problem in the actual antenna system and not in the monitoring.

Now, after looking through all the components in the tuning networks and not finding any obvious problems, I began to suspect the connection between the tuning network and tower number two. The tower is fed through copper tubing to a junction box that is welded to the tower.

Early in 2007, we had a similar but worse problem with this same connection on tower one. The connection then had almost totally come loose after several ice storms had gotten water into the gradually loosening connection. The water froze and expanded the joint to where I could no longer get the parameters back in legal tolerances with the tuning of the phasor.

This time, it was certainly not that dramatic, but I was having a shift occur during temperature changes and rainy conditions, so I certainly suspected this same connection. All these welds probably date back to the late thirties, when the towers were originally constructed. The connection on tower two was not loose but there appeared to be a lot of corruption of the joint and some flecking of rust from it.

Upon the suggestion of Cris Alexander, I once again put the ammeter in line at the base of tower two. I then took a broom handle while the station was in operation and the ammeter displaying the base current and tapped on the junction box connection. With two taps on the one side of the box there was no reaction. I then tapped on the other side of the box and I immediately had a change in the base current of two amps. I had obviously found the

problem.

Just days away from going on vacation I wanted to get this fixed. I obtained an acetylene torch and went to work on re-welding the connection. The repair was complete and I reasonably expected the pattern to be stable. For next couple of days before I went on vacation, it remained steady, so I felt pretty good about it not being a problem while I was gone.

Even while on vacation I kept an eye on it. I took breaks from the beach by logging into the computer through the Internet. It all remained steady throughout the whole week while I was in Florida. However, just when I was leaving Florida early one Saturday morning, I received alarms to my phone that the pattern parameters were out again just shortly after the station went to day pattern. I knew I had my work cut out for me again when I got back after a 12-hour drive back to St. Louis.

Due to a family medical emergency upon my arrival home, I was not able to get out to the transmitter site until early Sunday morning. When I got to doghouse two, I immediately noticed that a capacitor, in the output leg of the day network, was damaged. There had been considerable thunderstorm activity in the week that I was gone. This capacitor was a victim of Hurricane Ike, since the storms were caused by the remnants of the hurricane. The capacitor was bulging and one side of the potting material had become separated from the connecting metal plate. Additionally, there was a trail of melted jacket hanging from the capacitor. This was obviously the problem.

After getting a new capacitor, I replaced it and found that the bolt that it was mounted on was also snapped in half and the plastic insulators on that mount had also melted. This joint had become quite hot for a second or so.

With the replacement made, the day antenna system was once again restored to a very steady state. Having had two different things go wrong with the KJSL antenna system in the space of a couple of weeks, I am hoping that we have had our share for awhile.

Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! Well, now that summer is over, the weather here on the island has decided to heat up. I'm not talking just a few degrees here, either… it has gone from 70-80 degree days to 95-105 and the nights stay hot at about 85-90 degrees. We now have very hot, dry winds and it feels more like Baker, California here than Catalina Island. Last week it rained pretty good on the mainland, but we just got more hot & dry weather. Talk about fire weather, this is surely it! So, I continue to do all I can to keep the fire danger down here at our plant and to remain prepared in case we once again, are faced with a wildfire near the KBRT transmitter plant.

Not only is the weather strange here, but the economy is surely taking its toll on island tourism. It was like going from black to white with the flick of a switch when the nation's economic issues began making prime time news. Once it became clear the nation was in hot water, the next day our boats were almost empty. Where I used to wait in line for 10-20 minutes to checkout at the grocery store, I can now walk right in and out and many times, I'm the only shopper in the store!

It was that time again for us here at KBRT, time to take a spectrum shot to verify we are within our NRSC mask. Though all went well as usual here, the contract engineer I was working with raised concern with the noise floor that seemed to rise whenever both an analog and digital signal were present. This was noticeable just above our upper IBOC side band and just below our lower IBOC side band.

We had been playing with the sideband levels and had decided to take a look at the direct output of the exciter in order to reference the level

adjustment controls on the exciter with what we were seeing on his spectrum analyzer. We found that the adjustments on the exciter that I was making in 1dB steps coincided very accurately (within .2 dB) to what we were reading on his analyzer. Since I had made adjustments to our IBOC carrier levels in the past according to what someone was reading on their analyzer across the ocean in a remote location, I just wanted to make sure before we went on with the mask measurements.

The issue arose, however, when the contract engineer decided to take a look at J2 (RF sample) on the transmitter and then the RF sample at the bridge in the phasor. He noticed that when we switched on the digital carriers, the noise floor rose yet went away whenever we switched off either the digital or the analog. His assumption was that this would not allow us to remain within the NRSC mask as it appeared to be way above at the points were he was looking at the signal. I had noticed this noise floor before but never took issue with it as we always remained within our mask during past tests. Reluctant to go forward until he was able to resolve this noise situation, I figured, "What do we have to lose – let's go shoot the mask!"

Once out in the field, we set-up and began the spectrum shot. We fit the mask, and quite conservatively at that!

I got back to the plant and began a bit of research, noticing that the Nautel IBOC manual itself shows this noise floor. This turns out to be a situation where the combined digital and analog carriers create third-order intermodulation products that are seen at the transmitters RF sample point yet dissipates greatly in the field because of the filtering action of the phasor and ATU networks. So, no need to panic! And thanks to Cris, who offered, "If you observe you are making the NRSC mask and at the same time can get a good lock on your HD-R…all is well! HD Radio won't work with a corrupt spectrum."
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

An Unexpected Farewell

I didn't see this one coming. I got an email just recently from Ed Dulaney announcing that he was moving on. He is getting into contract engineering. To my mind, that's a huge hole to fill out there in Denver because Ed has some huge talents, and for years he was our main IT go-to guy. So now, who's going to fill those shoes? For now, no one, at least not another body. Amanda Alexander, who is a real up-and-comer, with the help of her most capable father, will have the position to herself. Of course we all wish her the best in what has to be her biggest challenge yet, and please don't bet against her growing right into that new set of responsibilities, but that's a lot of radio stations and a lot of technology she's going to be working with, more or less alone. Of course, she'll be evaluated as she goes along. But what happens if and when the time comes to move on a replacement for Ed? Where are we going to find someone with the right skill set? Eventually, we will, of course, because this is a quality company and the word does get around. But it will take some time, and as most of us know, there are a lot more jobs around this business then there are people to fill them. Amanda, welcome to the real pressure. And Ed, keep in touch. Best of bless to you in your new career adventure.

And just how DO we pass on the knowledge of what we do?

Several months ago our Illustrious Leader and new SBE Engineer of the Year, Cris Alexander, wrote a treatise in the pages of this very publication entitled, "What we do." It was one of those tomes that told us everything we who do Radio Engineering already knew, but never collected as one subject. I made copies of it and gave to both my troops *and* our

General Manager. It should be magnetically attached to every GM's refrigerator. The article was valuable because, frankly, we here in the trenches are just too busy to think about all those things, and it's rather nice to have someone put it all together in one place.

I have to vent a little here. Having to maintain such a vast and diverse set of knowledge validates my long-held belief that my parents lied both to and about me when they stated in no uncertain terms that this career path is blue collar all the way, and what the heck did I get a Masters Degree for, just for this? They resented me for my career decision, right to their graves, and for my part, I resented their attitude right back – and still do. I chose this career path because I love what I do and was, even if I say so myself, wise enough early on to see that this career was always going to need me. There were two pieces left in the puzzle. One was finding the right position within the business, which I found in spades right where I am and in which I couldn't be happier, especially when compared to others in this same career path who are not treated nearly as well. The last piece was put in place when I attained certification as a Professional in my field – long after my parents passed away, as it so happened. I doubt that it would have impressed them anyway.

That doesn't mean that I'm totally satisfied. I have a Masters Degree in Communications Arts and Sciences, which has stood me well in that I can truly relate with everyone else I work with in this station. That is a plus. I am literate, and I'm not afraid to communicate in ways that get people to take notice of what I say and to understand it well. I have accumulated, across almost forty years of experience in this business, a plethora of knowledge to help me in most of the situations I encounter in this job, from electronics to labor relations, the list of which Cris covered quite well in that earlier *Local Oscillator* article.

But there is a problem with all of this, and it's one which came into sharp focus in a recent conversation I had with a fellow engineer. A consultant, actually. Yes, he said, you have a lot of knowledge, but how can you impart all of it to an up-and-coming engineer? The more I thought of this, the more I realized that he's right. There's more information in my experience than I can possibly put down on paper, a lot that I have to jog my memory to remember, and just organizing it all is a problem, No, it's *the* problem. And you can't impart it all, aside from verbally, on the fly, if you can't organize it.

My second assistant here is James Kelly. I couldn't do my job nearly as well as I can without him. He is the ultimate Mr. Discipline, no nonsense. His value here is beyond measure, and one of his most valuable traits is that he has this habit of writing everything down. Seriously, folks, he has volumes of notes, boxes of them, down in our engineering rack room, and they are a gold mine of how this man does his job – even more so, how we should do ours. But the notes aren't particularly well-organized. He can't do that because he doesn't have the time. He, like all of us, is too overloaded to do that. Oh, to have someone get in there and commit all of that knowledge to a computer, in a form organized enough to let everyone who wants to, to get knowledge from it. That would be the ticket, but we can't seem to get the time to do that. That defines frustration.

I used to think that there should be a technical school course of study devoted to training Broadcast Engineers. I know it has been tried. I'm not sure that it's still happening. At the moment, both I and my friends in this business believe that the only way in which a Broadcast Engineer should be trained is by rote – at the feet of the master, if you will. That takes a long time to accomplish, but look how long it took me to get to where I am — forty years! Frankly, I'm still learning. It's how I and all of us should survive, And sadly, a lot of our knowledge has become obsolete. What use is there to knowing how to align a cart machine anymore? Worse, many of us are retiring and taking our knowledge away with us. That, in my view, defines tragedy.

But if ever there was a use for a training program through the SBE, this is it, and to an extent, the job is already done. It's called "Reference Data for Radio Engineers." It's a good start, but even that book hardly begins to cover anything near the range of information that a practical Broadcast Engineer has to have in his head. That's where the SBE should step in, and start a program for those of us who can share what we have in or heads, about everything we have to do in our jobs. That's what Cris Alexander is trying to do as chairman of the Education Committee, and of course that's a good start.

But I suggest that we have to go further. How about creating an online database for both the neophyte and experienced Broadcast Engineer to draw from? We have something of that sort already on the Crawford Broadcasting web site, in our Engineers Forum. Many automation manufacturers, not to mention Microsoft and its ilk, have had on-line knowledge bases for years. But the Crawford Forum and all the others are limited in scope to the technology that we in the company and they as manufacturers deal with in the here and now and, in the case of the Crawford forum, the time that it takes

for each of us to submit our knowledge to paper and web site. This endeavor that I'm describing should be much more all-encompassing than that. For instance: What *is* the best way to combat weeds permanently at a transmitter site. (Answer: Weed-B-Gone, rack or garden-weasel the stalks out, the plastic with gravel on top). Or, how do you deal with the problem of a filter choke with its winding shorted to the core from lightning, in a choke-input high-voltage transmitter power supply? (Answer: Put said choke on the ground return side of the circuit in the first choke position until your management authorizes a replacement). Get the point?

I know that this is a mammoth project, and the time and the cost (to get the rights to other databases for this purpose) in bringing such a project up to speed would be long and high, and maybe it should be open to SBE members only, as an incentive to join. But it should happen.

There, I proposed it. Now, who's going to put the bell on that cat?

Notes on the Zephyr IP, Continued

I recently asked one of my program directors if there was anything he wanted to add to our capital expenditures requests for 2009. He said, "Nothing you haven't already given me!" I asked him what he meant. He said, "You've already satisfied my wish list, with Internet box for sending remotes back to the station." Had I bothered to ask any of the other PD's the same line of questioning, I might have gotten something akin to the same answer. In fact, one of them now specifies that *only* the Zephyr IP be used on her station's remotes. There is no doubt in my mind that acquisition of the Telos Zephyr IP has revolutionized a major part of what we do best: get out into the community. If I could stick an ad slogan on this box, it would go something like this: The Zephyr IP.... Another promise of the Internet fulfilled. Indeed.

Having said all that, I'd like to bring us all down to earth again with some practical early experience wisdom about what this ZIP can and cannot do, and how to best make it do what it can do.

Just as with the introduction of the CD back in the mid-1980s, the concept of audio programs via IP is not quite as perfect as the hype would indicate. I remember hearing that you could drive a truck over a CD and it would still play. Right. By the same token, the same can be said about the new boxes which both Telos and Comrex have put out. They're not perfect, but they sure do improve on whatever came before them.

So, let's get the imperfections we know so far brought up and either solved or worked-around.

First, if you're going to have a Z/IP or Comrex IP unit in your stable, remember to put a couple of UMTS or G3 USB modems in your budget as well. Why? Well, the original concept of these boxes was for a *wired* connection to the Internet, and when you first set up the boxes in your station for test trials, that's what you'll use. And, they'll work superbly in that situation, because *you* have total control over your IP setup. Now, take these same boxes out to a client's location and try to do the same thing. And watch your expectations come crashing to earth. In short, no connection. The secret word of the day here is "firewall." Their firewall, the client's firewall, the one their IT person or vendor set up. And assuming that the particular IT company that set up your client's Internet system is still in business, which is a big 'if,' don't expect *them* to remember your client's firewall settings. Making those assumptions is just asking for it. Oh, you can get the client to ask his vendor to modify his firewall to allow your Z/IP box in or out, but don't expect it to happen.

And speaking of asking for it, it is highly inadvisable for you as a radio station engineer/IT person to go messin' around in said clients IP setup yourself. We have a rule here at Crawford in Chicago that our engineers do not go into any church client's *sound system* to install equipment to get their weekly church services back to the studios, either on a consulting basis or as a member of the department. They the churches have to hire that out to someone else. That rule has been in place for over ten years, and for a reason. The same should apply, in spades, to anything having to do with a client's IP system since in most cases, that IP system is their life line to both their clients and suppliers. The ramifications should not have to be spelled out.

Thus, the rule should be: When running an IP box at a client's station remote, bypass their system. Period. And that leaves only one alternative: Over-the-air G3. Fortunately, that technology is just becoming developed, and the good news is that, unlike ISDN, it isn't just the broadcasters that are using it, so G3 isn't going to be going away very soon. And every one of the big players in the business – Verizon, AT&T and Sprint/Nextel – is now on board. Hallelujah! But as in all cellular technologies, there will be differences in coverage from vendor to vendor. So go ahead, use them all. Get one of each. We are. Then take all three out with you on a remote site line check, and pick the one with the best connection.

In fact, we've come up with the novel idea of using one of our G3 units as an emergency backup Internet connection for our on-air operations, in case our Comcast broadband service goes down, which does happen, though rarely. We just identified a workstation in the office which is both easily accessible for the on-air staff and has good connection quality for the G3 box, plugged the G3 into the USB port, and trained the staff in how to get it on line in case of a Comcast failure. When the G3 box is needed for a remote, off it goes to the client's site, is used, and then brought back and plugged into the office workstation for the next emergency. No sweat.

That's one problem solved. The second involves your own in-house IP system. Make sure that both your router(s) and switch(es) are absolutely up to snuff, which means, to handle all the data coming at, in and through them. And get rid of any hubs you might have. To neglect the hardware is to make the system prone to data loss during an IP remote, not just in your remote IP audio, but in the other parts of the system as well. We had an IP remote fail recently due to a router that went defective. We don't know why it happened, but a new router is now in place and it's peace at last. Thing is, the symptom of the data loss was not something we expected. We expected the audio to entirely disappear when that happened, as is the case with data loss in an HD radio receiver. Not so. Instead, the audio merely slowed down, and in our case, that included the on-air audio from the Prophet NexGen automation system. Uh-oh. The next most obvious solution, and one we're planning to implement (and I mean *planning*) is to split our platforms between automation and everything else. That really is the best way to keep the system sane---break it down into smaller sections.

This technology is new. As time and experience progress, more problems, and solutions, will arise, and as they do, I'll keep you informed.

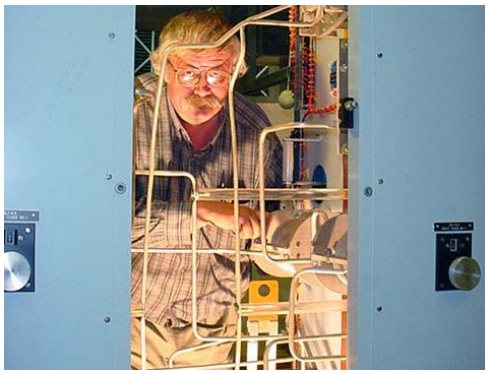
Next month, I'll have a big one for you: How DIN-rails can make your life easier. Seriously, folks, I'm not kidding. You'll like it. Until then, blessings!

The Portland Report

By
John White, CBRE
Chief Engineer, CBC–Portland

Our Visit from the Fire Marshal

I had a visit from the local fire department a few weeks ago. Don't worry; this was a visit that everyone should arrange. Three firemen and I spent a good part of the day walking through the building and grounds discussing scenarios, what might happen and what the department needs to know for their and the public's safety. Many questions were things I hadn't considered.



Broadcast studio facilities aren't all that complicated from a fire department point of view. In many ways, they're not all that different from other office space. In office environments, expect a periodic visit from the fire marshal. KKPZ has had two such inspections covering mostly the normal office issues. Transmitter facilities are very different.

One example: At a party, a group of teens play a game of dare with one of our towers as the target. Ignoring the signs and RF, one of the boys begins to climb, step by step until he gets or 50 or 100 feet. Looking down, the reality finally penetrates. If everyone is lucky, he climbs back down. Or more likely, he freezes. He may just hang on or he might fall, and if he falls, he might well catch his leg in a cross member.

Either way, we now have a rescue situation. Now pause a moment to consider what you would need to tell a fireman as he prepares for a rescue. No, the RF won't electrocute him. Yes, the RF is dangerous and can burn. Where

are the transmitter shut-offs? How can he insure that the transmitter will stay off?

This is just one of several scenarios we discussed, things the department sees every day and you and I don't. In the example above, my advice to them was to turn the transmitter off using the breakers. The shutoffs are labeled on our transmitters.

We worked through a fairly lengthy list. Volatiles, yes, including generator fuel stored in a concrete vault (they were pleased with that.) Sprinkler system – how can they find the standpipe? Access – we have a fire department keyed lock box. Is the access information current?

One thing I learned. I thought I had secured the building doors. Yes really, I had thought that. Outside doors open out. Several of the doors in our building have questionable locks. My solution was to use an inside slide bolt. As we were looking in the area of one and glancing around outside, they were discussing using that door for access during a fire. I was about to comment about the slide bolt when someone else brought it up. The caption commented that's all right, we would just cut the hinges, at which point the light went on for me about just how easy it is to break into buildings – even ones with secure deadbolt locks.

The Blue Screen of Death: A Short, Cautionary Tale about Computers.

Recently, our control room computer started to halt with a Windows stop error, otherwise known as the "blue screen of death." Research suggests that the problem may be related to a program that is misusing memory. A word to the wise: users should not indiscriminately put programs on system computers.

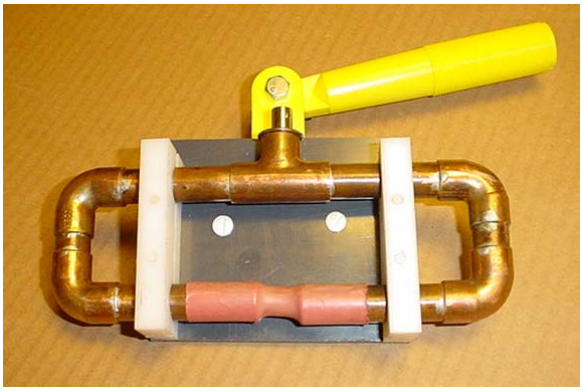
DA Parameter Drift

For some time, I have had a phase drift for tower two. When I first saw it, the phase of tower two would drift up two or so degrees with not much change in ratio or the tower three parameters at all (tower 1 is the reference tower). That wasn't difficult to deal with, adjusting the warm phase slightly high so the drift centered around nominal. Seasonal temperature changes also were easy to deal with.

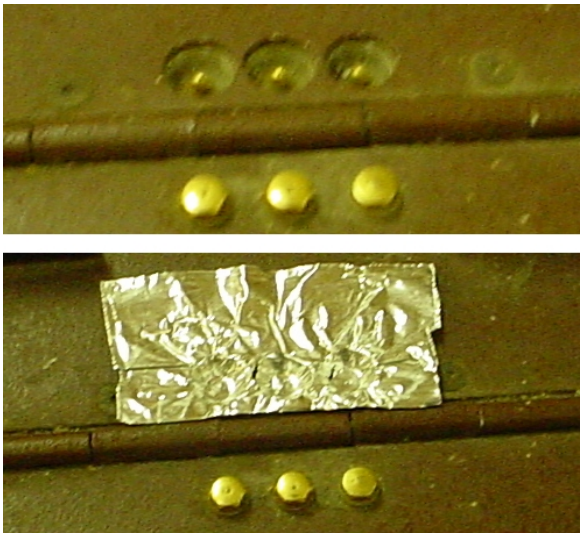
But nothing ever stays the same. Over time the drift has gotten worse. This summer, it has gotten much worse. Time to deal with the problem. The obvious candidate is a bad or overheating mica cap. The obvious test tool was my IR thermometer to look for any components that are overheating. I started with the tower two ATU.

Only the output arm of the ATU tee net showed elevated temps. The input arm and the shunt indictor showed a two- to four-degree rise. Both the output arm inductor and capacitor show approximately a ten-degree rise. It also looks like the original cap was a larger (physical) cap that is currently in place. I did have some replacement caps to use for testing. That was the good side.

The diplex filter was next. All inductors showed a small rise around two to four degrees. The series branch capacitors show a similar two- to four-degree rise. Not out of line so far. The shunt element capacitor, which grounds the tower at the other frequency, shows approximately a 30-degree rise. That's huge and just where it's most complicated to deal with.



Shielded loop for sniffing RF current



The "fix" for leakage into the FIM

To make a long story short, replacing the ATU caps didn't make any difference. So I ordered a vacuum replacement, two in parallel, actually. I'm

working through the mounting issues and will be ready to install them shortly.

Since this is a shunt element and the tower is not under power at the other frequency, adjustment of the 1640 kHz pass to ground isn't difficult. The 1330 pass is another matter. Discussing the adjustment with Cris, he suggested the best adjustment is for minimum current through the network at 1330. Here is my solution: Some time back, I built a small shielded loop for just that application, looking at RF current in a conductor. Using this loop with an FIM serving as a frequency-selective voltmeter should make adjustment fairly simple.

One problem with using an FIM is the stray signals getting into the unit. Some time back I was using the FIM as a detector for a bridge. I was getting some interference from a nearby station, which made the measurement difficult. I disconnected the coax from the FIM to move it and the interfering signal didn't go away. The antenna / external switch on the FIM is leaky with only about 20 or 30 dB isolation at best. The photo here shows the contacts for the antenna, which is in the cover. Below is my very expensive adapter, which corrects the problem. Yes, that's right, a small piece of aluminum foil. The foil shorts out the antenna while allowing the cover pin switch to activate the FIM power.

Rocky Mountain "Hi"
The Denver Report
by
Amanda Alexander, CBT
Acting Chief Engineer, CBC - Denver

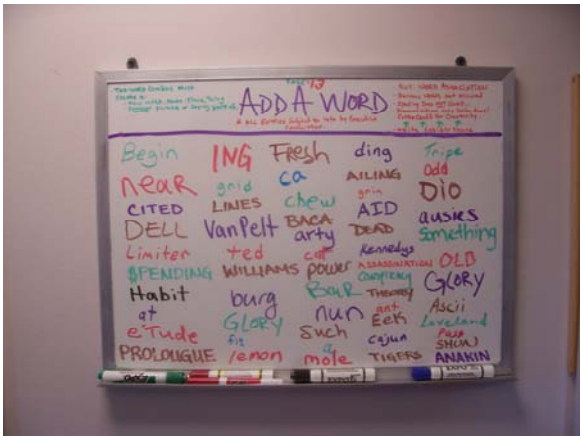
The past month has been a hectic one for me. Actually, the last six weeks have been hectic. As most of you know, I was in an ATV accident on August 13th with Robert Payne. I suffered a broken ankle and had to have surgery. I had to learn to use crutches without falling, which did not go so well. I fell once, down an entire flight of stairs, but thankfully, that was it. I was finally put into an "air cast" boot on the 26th of August. Needless to say, sleep did not come easily as I was still in quite a bit of pain. Six weeks later, I am finally allowed to walk with the boot on without crutches. I find myself being able to do more and more every day.

With the crutches, work became difficult. I couldn't climb on anything. I could not get to the ground easily because of the pain. I couldn't fit into small spaces because of the room needed for me to use crutches safely. I could not go to the transmitter sites. I was stuck at the office for the five weeks. I found plenty of things to do, but for any lifting or moving of things, I had to rely on others to help me.

One project I was able to do on my own (for the most part) was clean the engineering room. A week after my return, Ed went on vacation. Engineering had become very cluttered and messy while I was gone on my vacation, so I decided to clean it. It was very interesting hitting the big empty boxes with my crutches, finally getting them out of engineering and having a coworker come help. I was able to get the room cleaned up very nicely. I even swept. I'd find a place on the floor, sweep all around me, put it into a pile and move on. This was a great accomplishment for me with my limited mobility.

One of my ongoing projects is learning Linux. With the Denver cluster having so many servers that run Linux, I decided I needed to learn. Ed and I put our heads together and realized we could install a basic version of Linux onto a USB Flash Drive. We ordered a 16 GB "drive" from Microcenter for only $39.99. We installed Linux on it and I played with it for a few days on my computer. It ran very slow from the flash drive, so Ed and I formatted a swap partition on my computer to make it run faster. It is still slow, but not as bad as it was. I haven't played around much with Linux on the flash drive in seven weeks or so.

I found at Linux.org a link to some free online training courses for Linux. It has three courses: beginner, intermediate, and expert. During my time of limited mobility, I read about Linux. What I found as I was reading the beginner course



was that I knew a lot of it. I still don't know all the commands, but I know more than I thought. Once things settle down some at the office I'll read the intermediate course.

My thought as I started this project was that if I can learn Linux from using this flash drive and reading the courses online, other engineers within the company can learn it the same way. Linux is something I think every engineer at CBC should know. It is an amazing operating system and it works well for servers.

On August 18th, Ed called me into his office and informed me he had resigned, giving two weeks notice. I was shocked when I heard this news because I never thought he'd leave the company. After a talk about why he was leaving, I had a meeting with my dad, Cris. He informed me that I'd be taking the reins for at least three months to see if I can do the job. With this news began the worry and panic of having to learn all I can in two weeks. TWO WEEKS! We made a list of all the things I need to go over with Ed before his departure on October 3rd, and that Friday I began the learning process. As I write this, it has been a week since the learning began. I know that this is producing a lot of stress because I am actually dreaming about work, something that does not happen often.

I recently got the chance to reinstall Linux on the mail server as it was having problems. This was a fun learning process. I got to see how it all works, the installation, configuration and all. Once we got Linux installed, I got to install Scalix. Scalix did not work the first time I installed it. Ed was with me and could not figure out what was going on, either. While I was doing some other work, he reinstalled Scalix again, and this time it worked!

We have a marker board outside my office called the "Add-A-Word" board. There are several of us around the office that have some fun while working. We started this board a year and a half ago. In order to play a game, you make a word. For example, the word "barbie" is on the board right now. The next word below it is "cue." That makes "barbie-cue" or as we spell it barbeque. You use words to make words. Ed usually adds words that really stretch our minds. We are going to have to have him play every once in a while through email to keep our minds stretching.

I have learned to rely on Ed for a lot of my work. I guess he's my work "crutch." I have always had him to go to if I didn't understand something I was working on, when I have to go and fix a transmitter and so much more. I could always call him and have him help me figure out the solution to the problem. I'm going to have to throw my "crutch" away and hit the ground running. This might be a problem with my foot still in a boot for another month or so. The fact of the matter is Ed will be missed here in Denver. I have big shoes to fill and can only hope that one day I'll be able to do just that.

A Fond Farewell
By
Ed Dulaney

It's with very mixed emotions that I write this, my final Rocky Mountain "Hi" column. But the time has come for me to move on down the road and enjoy some new adventures!

These past 12-plus years have been some of the best experiences of my life. I've had the chance to build the new studios here in Denver 10 years ago, rebuild a couple of the directional arrays, build a new directional array, and many other fun projects over the years. I've been able to work with some great people during those projects as well.

I hesitate to start naming names, as I know there will be those that accidentally get left out of the list. So I beg your forgiveness if I accidentally forget

to mention you!

First and foremost I want to recognize Mr. W. C. Alexander for everything he has done to not only help me become a better engineer, but for all his friendship over the last 15 years of my life. I still remember the first day he and I went skiing at Loveland together, and watching each other fall down more times that we would ever care to admit!

Then there's Amanda Alexander, who will be taking the reins of this engineering department. She's still learning the ropes, and this will no doubt stretch her comfort zone tremendously! But I have confidence that she'll not only succeed, but excel!

Of course the engineering department couldn't run at all if not for Elizabeth McGuire behind the desk. I'll miss her occasional visits to my office in search of a missing Home Depot or Lowe's invoice!

Stephen Poole has also been a great friend and someone that is a fellow Linux enthusiast! Naturally, I take full responsibility for his Linux addiction, having introduced him to Mandrake Linux many years ago. You're one of a kind, Rev. Poole!

Other CBC engineers have also been a great help to me in the past. People like Rick Sewell, Art Reis, Tom Gardull, Bill Agresta, and Todd Dixon are what I would call the cream of the crop! With people like you in charge of the electrons, this company is in good hands!

Then there's Larry Foltran. My only complaint about Larry is that he likes Windows a little too much! But, that's okay. I'm going to let Stephen Poole continue your Linux education! Larry, keep those email and web accounts humming! You're a great man!

One man who isn't a CBC employee, yet has been a great help to me, has been Robert Payne. He's assisted me in Denver with a few different projects as well as helping out in Birmingham. Just watch out for flaming eyeballs!

As for the rest of the CBC engineers, I only wish that I could have had more chance to interact with y'all. What little I contact I've had has always left me with the sense that you guys are terrific! So keep up the great work for the company.

Then, on a less technical end, there's Mike Triem, Julie Taylor, Leon Owens, Jr., Teresa Johnston and the rest of the CBC Denver management team. I'll really miss all of you and I hope that you will keep working to make this company great.

As for the remainder of those in the Denver office: Rather than naming names, and filling up page after page with praise, I'll just say that I've enjoyed knowing you and enjoyed your friendship.

The Next Page

As for me, I'll be working for a boss that is a real pain to work for. I've known this guy for over 45 years, and he's always been a thorn in my side. If you haven't guessed it, then I'll just tell you that I've started my own company, Broadcast Technical Consultants of Colorado. I'll be servicing a number of stations in Colorado, New Mexico, Texas and Utah. Of course, I've let Cris and Amanda know that I'll be available for helping out when they need me. But I've already got quite a few projects lined up for the coming months! And if you want to get in touch with me after I leave the company, feel free to do so. My email address is: colobcasttech@gmail.com

So, until we meet again... press on!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

The End of CDs Already?

SanDisk, a major player in the flash memory market, along with several major record companies including BMI, Sony and Warner Music Group, recently announced a new format for music sales. Called slotMusic, this is the music industry's attempt to give the consumers what they want…or is it?

First, let's take a closer look at what slotMusic really is. Rather than putting out their latest albums on those compact discs we've grown extremely accustomed to, the developers of slotMusic plan to feature album releases on Micro SD cards. What's a Micro SD card you ask? A Micro SD card is basically a smaller version of the SD flash memory cards that are used in digital cameras, PDAs, and some cell phones. The SD cards are used to store data that can be accessed almost instantly, without the moving parts of a hard drive. The Micro SD card is approximately a quarter the physical size of its big brother SD, making it four times more likely to disappear in the laundry. In terms of data, some examples of Micro SD can hold more data than SD and quite a bit more than your typical CD.

So either the albums of the future will be substantially longer than today's or record companies plan to give consumers more for their money. In my opinion, it's neither. The slotMusic cards will be 1GB in size and will feature the same songs that are featured on the CD version of the album. The main difference is that it eliminates the middle man… um… middle computer… when transferring your music to your portable music device. The songs on slotMusic will be in MP3 format, which will allow consumers to simply plug it into their device, provided it has a Micro SD port. Along with the music, the card can feature album information, cover art, video clips, photographs and a variety of other items consumers may be interested in. One important feature that surprises me is the fact that slotMusic will be free from any copy protection.

Perhaps this shift in format is an attempt to turn around dropping CD sales. As music downloads have increased by about 50% each year, CD sales have decreased by 20% in the last year. Reports also indicate that an estimated one billion songs are illegally downloaded each month. I'm quite certain that has put a large dent in record sales. Although some consumers may be drawn back to purchasing physical albums, enticed by the extra goodies offered by slotMusic, I believe the vast majority will continue to download music via the web, be it in the legal sense or otherwise. There have been numerous occasions where I've found myself purchasing a CD based on one or two songs I heard on the radio. But when I finally get the opportunity to listen to the entire CD, I quickly realized that the two songs that initially attracted me are the only two songs I like. Enter the world of iTunes and individual song downloads and that risk is gone.

The convenience of downloaded music is another aspect I see that may hurt slotMusic. Instead of wasting valuable gas driving to the store to purchase the latest album by my favorite artist, I can simply download the music from home and be listening to the songs in less time than it would take me to put shoes on, grab the keys, and pull the car out of the garage. Also in the convenience category, do you really want to keep track of where you put those tiny flash cards? I have a tough enough time keeping track of where I put my cell phone, and that's gargantuan in comparison. That brings me to another point. Have you ever tried replacing the flash memory card on your cell phone? Although some phone manufacturers have made the port location very convenient on their products, others place it behind the battery. I don't see those users taking their phones apart each time they want to switch from the White Album to Abbey Road.

Finally… cost. Why are people illegally downloading music to begin with? I think cost is a

major factor. Granted, there are people who would simply rather get something for nothing. But I believe if entire CDs were less expensive, iTunes and other legal download options wouldn't be as successful as they are. Reports indicate that slotMusic will have the same price tag as current CDs, although I believe they will end up being pricier once finally released.

The one area that I believe slotMusic has the thumbs up on their side of the chart is the potential for unique extras. I don't believe extra features will be enough to turn the trend around, but devoted fans of specific music artists may be willing to look towards slotMusic if that's their only source for exclusive extras. Based on the fact that the content will not be copy protected, I suspect any features released exclusively to slotMusic, won't be exclusive for very long. Those features would quickly find themselves on illegal download sites right along side the songs from the album.

I give credit to those trying to step away from the status quo and push in another direction. I also see slotMusic as an attempt to put the well-deserved money in the hands of the artist who created the music. What I don't see is slotMusic becoming the next standard in music distribution. I think it's safe to say that you can expect to see CDs stick around for a bit longer.

…until next month!

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 • Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2
WDCX • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT
WEXL • Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D
WLGZ-FM • Webster - Rochester, NY
102.7 MHz, 6 kW/100m AAT
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT
WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT
WYRB • Genoa - Rockford, IL
106.3 MHz, 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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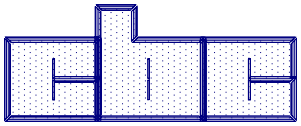

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