The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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What We Do

Have you ever been asked what a broadcast engineer does? There was an interesting thread recently on the "SBE Roundtable" remailer that dealt with the question of what a broadcast engineer actually does (the actual thread title was something to the effect of, "Does your general manager know what you do?"). How would you answer that question? What *does* a broadcast engineer do?

The easy answer is that we are responsible for the technical operation of one or more broadcast stations. Good answer, but it doesn't even come close to painting the whole picture. Consider the *scope* of what we do…

Studios – this aspect of our work used to involve mixers ("boards") and source equipment such as microphones, turntables, cart machines, cassette machines, DAT machines, CD players, MD players, phone hybrids and the like. Now our source equipment complement is much more limited. Sure, we still have the stray CD player, maybe even an unused MD player, in the racks, but our primary source device these days is the digital audio workstation. We still deal with mics and phone hybrids for live shows and occasionally satellite receivers, but by and large, everything comes into the station via FTP or ripped CD these days. Our larger operations have done away with mixers altogether and now employ digital routers for mixing and routing. So the majority of our studio "audio" and logic work is in the IT world nowadays. We're computer/network engineers and programmers.

Transmitters – much of the RF end of the broadcast engineer's job still involves transmitters, antennas and transmission lines, and in the AM world, phasing and coupling systems. But so often the program feed enters the site as a digital signal that is demodulated into several components at the transmitter site – AES digital audio, PAD, remote control/telemetry and other TCP/IP/UDP signals. Our processors are largely digital devices these days… ones and zeroes in and out. Our exciters have CD-ROM drives and hard drives plus color touch screens. Even our transmitters more and more have Ethernet interfaces rather than closures and analog samples for control, status and metering. On a regular basis, I hear from you that the issue is that one piece of equipment isn't properly "talking" to another piece of equipment, something to do with IP addresses, ports and protocol. Sure, we still make RF with transmitters and produce a radiated E-field that propagates through space to our listeners' antennas and receivers, but just about everything up to the RF stages is digital. So again, we're computer/network engineers and programmers.

But we're not *just* computer/network engineers and programmers.

We are *electrical engineers*. We have to understand AC power and power distribution systems. We have to have a good understanding of the National Electrical Code and National Fire Protection Code. We must understand proper grounding and have a firm grasp of lightning protection principles.

We are *mechanical engineers*. We have to understand the static and dynamic heat loads of our studios and transmitter buildings as well as the static and dynamic heat loads of our equipment. We have to know how many kilowatts it takes to generate a "ton" of cooling and how many BTUs of heat there are to a kilowatt of electricity. We have to understand refrigeration systems, heating systems, airflow and such pressure/vacuum measures as inches of mercury. We have to understand HVAC control systems, thermostats, lead-lag controllers and safety circuits.

We are *hydraulic engineers*. We have to know what runs downhill. We have to know how to "sweat" a joint properly – not necessarily for a

pressure-tight connection but often for a good RF/electrical connection. We have to know the importance of condensate drains and their routing. We have to know that water and electricity don't play well together.

We are *civil engineers*. We have to understand drainage and runoff. We have to be able to lay out a transmitter/tower site properly. In some cases, we have to know how to properly operate a transit and a tape measure. We have to be able to speak the language of city or county plan-checkers, dealing with issues of setback, fall radius, slope, flood plain and the like.

We are *structural engineers*. We must know what will provide a secure mounting for an antenna or transmission line. We have to have a good working knowledge of the dynamics of radio towers and supporting structures and be able to communicate well with the engineers who design them and the crews that service them. We have to know where it is safe to place a ballasted roof mount for a satellite antenna.

We are *safety engineers*. The safety of employees, contractors and the public is many times in our hands to some degree. We have to know to what height it is safe for a tower worker to climb before we must reduce power. We must know the exact procedure that must be followed to get a climber through the aperture of a broadcast antenna. We have to know when our towers are in compliance with FCC/FAA marking/lighting standards and what to do when something goes wrong. We have to know how to insure the safety of others (and ourselves) when working on equipment containing hazardous voltages.

We are *lawyers*. We have to know the law that applies to broadcast stations and insure compliance. We must have a good understanding of civil law as it concerns broadcast facilities, tower sites and the like. We must know something of employment law, tax law and the applicable case law as it affects those things.

We are *accountants*. We have to prepare budgets and track spending. We occasionally have to "count beans" and track assets.

We are occasionally *board operators*. We are occasionally *producers*. We are occasionally *voice talent*. We are occasionally *editors*. We are occasionally *schedulers*. We often build clocks and generate logs.

We are *groundskeepers*. We are responsible for maintaining our tower sites, keeping the grass and brush mowed and the tower bases clear of excess vegetation.

We are *mechanics*, taking care of the big diesel, LP or gasoline engines that fire our generators.

We are *pest control technicians*, fighting the good fight against bugs of all kinds that love the inside of our transmitter buildings and equipment much more than the outdoors where they belong, along with all the mice, rats, snakes, birds, squirrels and other would-be faunal invaders.

We are *building maintenance engineers*, responsible for the health and well being of our studio and transmitter buildings, sometimes changing light bulbs, unstopping toilets, fixing air conditioners and patching roof leaks.

We are *IT techs*, dealing with jammed printers, office network problems, email issues and viruses.

What else? The list goes on and on. Sometimes I wonder if the better question would be, what *doesn't* a broadcast engineer do?

The answer… not much.

NAB Convention

Yes, it's that time again, time to pack the bags for a few days in Sin City for the National Association of Broadcasters spring convention. I've lost count of the number of years I've attended this event.

My dance card is full for this year's convention, with one commitment following the next. My feet are already sore just thinking about all that walking. But I do look forward to seeing the latest offerings from the various manufacturers, and to seeing old friends and colleagues. I'll bring you a full report next month.

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

Hello to all from Western New York! Have you ever noticed that things seem to happen all at once, especially in broadcast engineering? You can go weeks at a time with few or no breakdowns, and then you get hammered with a half-dozen problems, all at the same time. The month of March was like that for me. Everything was quiet, and then before I knew it, I had a list of "to-dos" an arm's length long.

I have mentioned in previous articles about time management, but when these episodes flare up, the concept of time management goes out the window. The problem I have with multiple, simultaneous problems is where to start first. Naturally, those problems that affect the station's air sound take priority, and then you can chip away at the other dozen or so items that require your attention. In the past three or so days, I have started this column several times only to be called away to perform some vital engineering duty. That's okay, but each time it happens, I lose my concentration and have to start all over again. I guess that is a sign that I'm getting older, or that my brain cells are dying at a rate of about a thousand a day. Whichever one applies, I'm pretty sure that it is not a good thing. I've heard it said, "Time was invented so everything doesn't happen all at once," but for some unknown reason, this concept doesn't seem to apply to all of us.

I would like to take a moment and congratulate Bill Stachowiak, former owner of S & B Communications and current chief engineer of Regent Broadcasting – Buffalo, on his inductance into the Buffalo Broadcast Pioneers Hall of Fame. Each year, The Buffalo Broadcast Pioneers Board of Directors votes on those individuals, past and current, who have contributed to the growth and development of radio and television in the Buffalo market.

The Buffalo Broadcast Pioneers was organized in 1996 with the sole purpose of documenting and recording Buffalo's rich broadcast history. They have a very interesting website outlining the history of Buffalo radio and television, including video and audio clips from yesteryear. You can check out the site at www.buffalobroadcasters.com. I cannot think of a more deserving recipient of this award, as Bill has done so much in the area of radio engineering in the Western New York and Pennsylvania regions. I am fortunate to have had the opportunity to work with Bill for eleven years, and to continue to share ideas and advise whenever possible.

WDCX – Buffalo

We are finally beginning to see forward progress in the WDCX transmitter building project. This past week, Don Boye of Western Tower Service completed fabrication of the new ice bridge between the tower and building. This work was delayed for some time as the winter weather has been relentless for the past several months, with extreme cold temperatures and significant snowfall hindering the completion of the installation. In the mean time, our electrician has completed the wiring to the racks along with the communications conduit between the old building and the new one. Once the weather gets above freezing, we can plan on moving the antenna feed-lines into the new building along with the transmitters and associated equipment. This project began last September, and numerous delays have all but halted the it. I for one will be glad to have this project finally done.

Last fall, WDCX purchased a new Telos 2x12 telephone system along with two of the Desktop Directors. Practically out of the box, we have experienced numerous problems with this new system. It all began with the hybrid randomly re-booting itself and disconnecting the network to the call screener software. We sent the hybrid back to

Telos twice, but they reported they could not find anything wrong with it. I eventually discovered the problem was not in the hybrid; one of the Desktop Director consoles was the cause. We shipped it back to Telos, but again, they could not isolate the problem. After I received it back and it failed again, I demanded a replacement Console. Telos readily agreed and shipped the new console out to us. We have not experienced any re-boot problems since, but a new set of problems has developed. The control consoles will show that there are active lines attached to the hybrid where there are none. A call to Ted Alexander at Telos revealed that they have never seen this problem before. The "ghost" lines do not appear to hinder the operation of the hybrid in any way, but it creates confusion to the call screener and talk host when they go to select a line that isn't there.

WLGZ AM/FM – Rochester

While we are on the subject of hybrids, the old Telos 100 system I removed from service in Buffalo has found a new home in Rochester. Recently, their Telos 1x6 phone hybrid in the WLGZ-FM studio began malfunctioning. It would randomly hang up on callers and the hybrid would not busy out the request lines for longer than 30 seconds. As their call activity has greatly increased since moving the Legends format to the FM station, we agreed that a second hybrid would be a good idea for the control room. After removing the Telos 1x6 from service and bench testing in Buffalo, I found the cause of the problem was in the 5vdc supply. With the voltage adjustment to the maximum, I was only able to get 4.67 vdc out of the supply. I suspect that some of the capacitors have failed and plan to "shotgun" the supply to get it back up and running as a spare.

On a recent maintenance visit to the WLGZ-FM transmitter site, I discovered that the PA grid tuning capacitor was seized in the Continental 816R-2C transmitter. I attempted to clean the tuning shaft of the capacitor, which worked momentarily, then seized again. I have ordered a replacement cap from Continental Electronics and plan to install it sometime in the first week of April.

I am overjoyed at how well our BE HD transmitters are working. Aside from a hard drive failure in the IBOC generator, the BE transmitters just sit there and hum along (I guess they don't know the words! I know, I know… stick to engineering… there are enough out-of-work comedians…).

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

The Motown Update

by
Tom Gardull, CBRE
Chief Engineer, CBC–Detroit

Phone Trouble

We all take our utilities (electricity, cable, water, etc.) for granted until they do not work. Our several months long telephone service difficulties continued throughout March. The strange thing is that no two of the problems we've experienced are alike in their origination, but they all cause the same problems, namely outages, poor quality and unhappy users.

Most of the occurrences are related to deteriorating underground cables in the neighborhood. WMUZ is at the end of the master distribution cable for the local exchange, so we get hit with any problems affecting the infrastructure. Old cables get flooded during the spring thaw which causes short-term problems of hum and static on our lines.

Then a 300-foot section of one cable under nearby Plymouth Road was totally shorted and needed to be pulled out and a new span spliced in. It took over a week to fix with AT&T trucks over every manhole cover every tenth of a mile for over a mile and other parts of the road dug up. During that time, we lost half our POTS lines and several of our special service program channels. I kept rearranging the remaining working lines so that studio and fax lines would still work.

Finally, the splices were made on the trunk over a weekend, but then came the individual problems of still bad cable pairs with hum and misrouted telephone pairs. On a Monday afternoon, all lines started working as they should.

On a Tuesday in mid-March, the main number to the station stopped working. It took a while to realize the phones were not ringing into the switchboard as often as normal. The line was dead and callers only heard the phone ringing with us not answering, unless two people were calling at the same time whereby the trunk-hunt feature would roll over to a working line. The callers would complain about not being answered. We had the phone company busy-out the non-working main line so we could get calls. It took a week for several repairmen to track down the problem at the central office as a programming error after (logically) looking for a cable problem.

The problem we're now experiencing showed up after they got the main line working. Our main number now rings in on *two* of our lines simultaneously. This seems to be confusing our own PBX, which now has some call collisions between incoming and outgoing traffic on these two now bridged lines. It has to be another programming error at the CO switch.

These problems are partly caused by an odd numbering system installed many years ago by Michigan Bell. Before all the new area codes were created, there was a fear of running out of phone numbers. So to conserve numbers on services that really did not need unique numbers such as trunk-hunt groups (for which only the lead number is published), they assigned lines with a tier number. So in our case, we have four lines all with the identical drop-ID, just listed as tier 1, 4, 5 and 6 in the paperwork. Repairmen inadvertently swap pairs or misprogram the switch because they mix up which Line they are really working on. Now that there are lots of available numbers, I am asking AT&T to drop the tiers and give us real numbers. This will be in their interest and ours, especially after I spent half hour on my cellphone explaining tier numbering to another repairman.

We are looking for an alternate way to have our phone service delivered as the unreliable outdoor infrastructure is slowly fixed.

HD Radio Update

The local 50 kilowatt AM station, which had been operating without its HD-R signal for two months, turned it back on. They had an equipment failure, probably an exciter lockup, that took them off the air for an hour during morning drive in early February. Now they are back on day and night.

News From The South

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

If you talk to someone who has suffered from copper theft, they'll invariably say something like, "The crooks took $50 worth of copper but did thousands of dollars worth of damage." That has definitely been the case at the WXJC site in Tarrant, where we have been repairing the damage done by copper thieves back in February.

The good news is that we can see the light at the end of the tunnel. To date, we've repaired and replaced all of the damaged or stolen copper, we've replaced all of the old wooden fences with new chain-link ones and most importantly, we've added a ton of new security. We've paved over the new copper to make it much more difficult for thieves to remove. Finally, we've given a lot of thought to the problem of protecting isolated transmitter sites from copper thieves, and I'm going to share what we've come up with so far.

Two Types of Thieves

There's no way to stop a truly determined thief. Let's state that fact at the outset and just accept it. If someone really, really wants to steal from you, he (virtually all copper thieves are males) will find a way. But practically speaking, you can just stick with the basic idea of security in general: you just want to make it so difficult that the thief will decide you're not worth the bother. He'll leave you alone and move on to somewhere else. Knowing what he wants and how far he'll go to get it are critical pieces of information.

Metal thieves come in two varieties: those who are out to make a quick $20 for crack money, and those who methodically plan the heist to take as much copper or aluminum as they can. I want to expand on what I said last month, when I primarily focused on the latter category. I've experienced both types myself and know that you have to plan differently for them.

Mr. Quickie won't be dissuaded by an alarm system. He'll dash into your compound with bolt cutters and tin snips, snatch a handful of copper and then run before the police can arrive. The way that you frustrate this guy is by simply making it difficult to take the copper. Put in a good fence (and keep it in top condition). Make the copper physically difficult to remove, too. We're experimenting with copper pipe instead of strap where it's exposed above ground. Some of the ideas that we're toying with include filling the pipe with concrete or sticky tar to frustrate simple cutters and hacksaws.

On that subject, I said last time that just coating copper with tar wouldn't help. It does NOT (as some apparently believe) make the metal worthless to a scrap dealer. The thief won't get top price for it, but it will still sell. There are solvents that can remove most tar or paint and the smelting process will generally take care of everything else. On the other hand, if you use that tar to make the copper very difficult to remove, well, that's a different story. This is why we paved over the critical ground system at each tower base in Tarrant. Unless the thief is willing to do a lot of nasty work, the most we'd lose now is a few straps and a feedline, easily replaced. The way we did the paving provides another benefit: the tar seals the bottom of the fence fabric. The thief can't easily take a car jack and crank the fabric up so that he can crawl under it.

WXJC Tower 3 - note that the fence fabric is sealed in the asphalt

We've been asked: what if we need to repair the ground system in the future? It's simple: we'll just run new strap, screen and radials atop the asphalt, then add another layer of tar when we're finished. The benefits outweigh the disadvantages by far. In fact, I've reported in previous issues that we've always had problems at Tarrant with seasonal changes in the antenna monitor readings. In the past, when a rainy spell would hit, we'd have to adjust the array; when the weather dried back out, we'd have to re-tweak. It's too early to say for sure, but the new copper screen and asphalt appear to have made a difference here, too. Todd, Jimmy and I spent over a week methodically brazing all of that new copper at no more than one-foot intervals – we even tacked it to the fence fabric at regular intervals using good Sil-Fos brazing rod. Thus far, the antenna monitor doesn't seem to change nearly as much between wet and dry periods, so we may be on to something here.

The second type of thief, the Methodical Guy, is after real money (our trailer thief from last month fits into this category). He wants to take as much metal as he can, which takes time and planning. He's more wary of alarms and cameras, but no one single approach will stop him. You can't just rely on gate switches, for example; he'll just cut through the fence fabric, or straddle the fence with a tall stepladder. Motion detectors, we've found to our sorrow, are horribly prone to false alarms outdoors, so you'll probably have to set the sensitivity way down and add a pet-type electric fence to keep small animals out of the compound. We did both, and mounted the gate switches inside armored boxes.

Gate security system switch and lower electric fence wire

Incidentally, we've recently discovered that some of these Methodical Guys are familiar with radio facilities – two of them that I know of are former tower climbers. I was chatting with Jim Coleman of Southern Broadcast Services just this morning, and he told me that one of his former employees had been caught stealing copper a few months back. So... I wonder if we should take names and pictures anytime a tower crew comes to the site? And the rule that I mentioned last month about not discussing the details of your security system with just anyone, unfortunately, would have to apply here as well. For example, don't tell the tower crew how to disable your alarm system, do it for them.

We've made a lot of progress, but there's still more to do. When an intruder intrudes, you want a siren that will curl his hair and flashing lights that will disorient him. You want him to panic and run. The problem is, the siren that we currently have is a piddly little 5-inch thing that you can barely hear at some of the tower bases. We're going to add additional units that are loud enough to turn the grass brown. As for flashing lights, Cris made a great suggestion that we're going to implement if at all possible. We've got some old tower strobes up in Cullman. I'm thinking about making those flash (in full, mega-candela day mode, too!) if the siren goes off. THAT should get their attention!

If it works, I'm gonna send Cris a NASCAR hat and declare him an Honorary Redneck!

Life Goes On

That's it from me for this time, but I'll make another (obvious) observation. When you're working

on a major project like this, everyday life goes on at the stations. The people back at the studios don't really understand why you're gone for days at a time; all they know is that their Shortcut editor has stopped recording, or that they're having trouble with a satellite feed, or any of a dozen other things.

I have two of the best assistants in radio. Todd Dixon and Jimmy Parker are both a tremendous help here in Birmingham, and I don't know what I would have done during this time without them. After we got the heavy copper work done at Tarrant, I basically sent Todd back to the studios to put out daily fires while Jimmy and I continued to work on security at the transmitter site.

Todd, having a fertile mind, addressed another problem that we're running across nowadays. Internet access has become a fact of life in radio. Show hosts use it to do prep and to get weather and news, everyone uses it for critical email, and you name it. We much prefer Linux to Windows simply because it's far more reliable and resistant to viruses, but it's not for the faint of heart. However, Todd found a way to use a "thin client" server for control room Internet access that not only gets new life out of old machines (saving the company a ton of money), but is more secure to boot. The Internet machines in the control rooms are basically just "smart terminals" without hard drives; the server stores all of the needed software. Having seen it in operation, the really amazing thing is how FAST it is! Those old Pentium II-era Compaq workstations fly like birds again. Way to go, Todd!

I'll let him finish up this month with a report on that. Until next time!

Computer Jurassic Park
Todd Dixon, CBNT
CBC-Alabama

Moore's Law is pretty hard on the radio industry. Just about the time that we get acquainted with the speed at which the fastest hardware moves, it'll be dwarfed by the newest piece of hardware in both speed and capability. Such was the case in Birmingham on the weekend that Hurricane Ivan came blowing through and a NexGen installer was replacing our two old HP file servers with two new Dell PowerEdge File servers. Sure, the HPs were boat anchors (each weighed about 75 lbs), but they had served a valuable purpose (and had almost 400 gigabytes of SCSI hard drive space, for crying out loud!). The servers made the move with us to the new studio complex, and when I would see them in storage, I had to admit that I would get moist-eyed and enter a self-imposed technical funk. I would often lament to Stephen about those servers and would vow to restore them to pre-PowerEdge glory someday.

At the same time, trickle-down computing had found a home for our Compaq Prosignia-era desktop units with Intel Pentium II Celerons and Windows 98 installed in our air studios and production rooms. Since the Internet has become a mainstay for talent use in on-air and production facilities, I was spending time tending to viruses (Windows 98 is a secure OS isn't it?), trying to find software that would be usable *and* would load before Christmas, and accumulating a bone yard of computers that was filling precious limited storage space. Not to mention that there was simply no room in our budget to justify new computers that would be used almost exclusively for Internet activities.

A couple of months ago, I was trying to get to the end of the Internet and stumbled upon the Linux Terminal Server Project website (www.ltsp.org). LTSP was the answer to my problems. It had all of the components needed for success: the HP servers could contain Internet, office, graphic, audio applications and user documents and serve them out in a speedy manner to any number of the Compaq Prosignias sans hard drives (i.e., as "thin clients") over a network. The basic arrangement is such that a thin client boots a ROM image off of a floppy disk or uses a PXE ROM enabled network card. It then receives an IP address from the terminal server and, once the connection is established, the terminal server can send any amount of data traffic between itself and the thin client and back. I settled on a complete package called K12LTSP (http://k12ltsp.org/) that is based on Fedora Core 6. Fedora is a free, open source distribution of Linux.

As the name implies, K12LTSP has a strong emphasis toward creating school computer labs with Internet, word processing, graphic and audio programs and kindergarten through 12th grade curriculum. Schools can save money by not going out to purchase the fastest computers — they use their older hardware (Pentium II class w/128 MB ram) for their thin clients. Also, software licensing in

Linux is not much of an issue as you can change it, use it, or distribute it in any way that you please.

The real strength is in customization. For radio, there are several advantages to having a thin client in the studio. The power usage on these machines is low, the CPU is not number crunching the hard drive because there isn't one, and most processors of that era are heat-sinked with no fan. The result? Quiet. The other result ... fast. The CPU now only processes mouse clicks, keyboard strokes and video information given to it by the server over the LAN. We plan on connecting about eight of these thin clients to one terminal server, but we could connect more. By the way, any devices (sound cards, CD-ROM's and USB) on the thin clients will work as they did before! Overall, less maintenance and expense.

The terminal server saves time as well. You need only to upgrade the software on the server for all of the clients to enjoy the update. One of the common complaints against Linux is the lack of so called "non-free" software (i.e. Acrobat reader, Java, flash player, and media codecs). While it is easy to add these things to any Linux system, I was surprised to see that K12LTSP included self installing links for everything except the media codecs. One of your must-haves will be a second network card for the terminal server. The first is hooked up to your regular LAN (Internet /office) and the other is connected to the LAN that all of your thin clients will live on.

I'm not going to lie to you. There is a learning curve to feeling comfortable with Linux. But even if you're a Windows guru who is not setting up an LTSP server with thin clients, smart engineers and Google are your best friends. Most of the problems that you'll encounter have already been handled by others and detailed instructions have been left behind. Setting LTSP up is no exception. Now you'll have to excuse me while I blow my nose, wipe my tears away and allow my self-imposed technical funk to leave the building!

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

In last month's column, I shared how close we were to getting the Canopy project done but how we ran into a problem with the tower crew losing parts. Because of that, less than 24 hours after the installation of the four-foot dish on the KSTL tower, the antenna had turned about 90 degrees off target. Of course this caused the whole system not to work. I was waiting for the replacement parts to arrive and had scheduled the tower crew to come back on the first Saturday in March. However, when I received the parts on the Thursday before that, I realized that they had sent us the wrong size part!

Not wanting this to stretch out any further than it had been already, I got up on the roof of the KJSL transmitter building and raided that easily accessible dish for the parts I needed, and put some temporary bolts in place there to hold it while the tower crew replaced the missing parts on the dish on the KSTL tower and re-aimed it. The tower crew got the parts replaced and re-aimed the dish without any issues this time. Once again, I wanted to wait to switch our STL link over from the telco T1 to the Canopy system. I just wanted to make sure it was stable.

Once again, less than 24 hours after the installation, we had another storm come through with high winds. Thankfully the dish did not turn in the winds this time, but we did have some data loss. My guess is that it was coming from the dish on the KJSL transmitter building.

I had used what we hams call a "home-brew" chimney mount made from unistrut and half-inch all-thread. This held an eight-foot, two-inch rigid pipe where the dish was mounted. I had mounted the dish about five feet above the last mount on the

chimney.

With a four-foot solid dish and 40 mph winds, although nothing would move, there certainly was some vibration. This is where I guessed the data loss was occurring. I definitely didn't want to move to system until I stabilized this situation. I also had some doubts about the connection of the subscriber module inside the KSTL transmitter building to the access point radio on the KSTL tower. The signal was not strong there and I believed it was due to the fact that the signal had to penetrate two roof lines that is a unique feature of this building. It worked, but I was concerned about what happened when it had snow to penetrate as well.

So before I would officially switch over to the system I wanted to at least straighten out the vibration of the dish on the KJSL building. Since the storms had brought some snow and ice, getting onto the KJSL building's roof was a bit precarious and would have to wait to until the ice thawed to make the changes. Well, the weather warmed and just as the thaw started, our "friends" decided to hit the KJSL T1 one more time for old times' sake. You knew it had to happen… just as I was about to get us off that problematic T1, the copper thieves came out again with the warmer weather.

As soon as I saw that the phone company was not going to make a permanent fix of the line but leave the temporary patch running across the ground for awhile, I decided that vibrating dish or not, I needed to move us to the new Canopy system. Additionally, I saw that there were no high winds in the forecast for more than a week, so I knew if we went ahead and moved to this system, I would have some time to solve the vibration issue. That weekend, when I didn't have any satellite feeds to worry about interrupting, I changed over to Canopy system.

This involved changing the KJSL Intraplex equipment from a T1 configuration to an E1 configuration and then sending it down the data channel of the KSTL Intraplex, over its T1 line and then through newly installed Canopy system to the KJSL transmitter site. For the most part this went okay but I did have a problem with the configuration of my audio cards in the Intraplex. I had forgotten to change a setting on the cards that should have been changed when moving from a T1 to an E1 configuration. Ed Dulaney from our Denver operation helped me discover this and get it corrected. We were in business on the new system.

Later that week, I installed guy wires using 3/16" wire rope on the mounting of the pole that held the dish on the KJSL transmitter building. I secured this on the pole right below where the dish is mounted and once everything was tightened, the vibration seemed to disappear. We have had some fairly strong winds since that time and have not experienced the data loss like that first day.

However, we weren't quite through with every bug that was left in this system. The one weak point that I worried about was the link between the subscriber module and the access point, but I didn't think it would be a problem unless we had six inches of snow up on the building.

I was wrong. The rain that hit the Midwest during the middle of March that caused all that flooding also caused issues with this connection. We had problems with rain and the combination of those two roof lines. The signal began to go in and out and eventually went below the threshold that would make the system work. I had to take KJSL to the backup ISDN audio.

When things dried up, I decided that we had to move that subscriber module outside so the roof lines were no longer an issue. I mounted it up on the roof of the KSTL transmitter building so that it would at least be somewhat secure from theft there. Once I got it on the roof and restarted the connection, there the signal level between the subscriber module and the access point increased to three times what it had been inside the building. This was no longer the weak point in the system and we have had no problems with this system since.

We still have one major vulnerability, and that is the KSTL T1 line. If the copper thieves ever start hitting this line, we have *two* stations that will be affected. At this time there really is not a practical way to replace this T1 line, so we are looking for a way to have a backup system for our audio through wireless Internet. Hopefully we can get this resolved before they decide to hit this line. In my thinking, it's not an "if" but a "when" situation.

By the way, at this writing it's been three weeks since the last copper theft of the phone line, and the phone company still has a temporary line running across the ground.

Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! Another month has passed and we are still dealing with the satellite Internet provider who continues to throw one wrench after another into the gears of this project. Although they have been paid to do the entire installation, I have become so tired of waiting and frustrated that I went ahead and installed the dish and ran the coax into the building, but all it has done since is sit. The "service" of most of the service companies I have dealt with lately seem to be lacking pretty badly. I know some of this is because of our logistics here on the island, but I have lots of friends on the mainland who have been experiencing the same thing and are growing frustrated. It seems you are doing very well if you can get what you ordered after several attempts and lots of time on the phone. Many I talk to say they never get anything close to what they were promised. This is just one more reason we need to be ready to do it ourselves whenever we possibly can.

We participated in Earth Hour by turning off our lights here at the KBRT transmitter plant, and again we stood above the talkers who promote all the green earth stuff here on the island. We turned out our lights, all of them, not for only the hour from 8:00 until 9:00 like the event had planned, but we left them out until 12:00 and used LED lanterns that were charged with solar power the prior day.

Now don't worry… I'm not going to get all "new-age" or anything, but I do think most Christians can do more for the environment than they do. I am certainly not to saying we should worship the earth as many of these "green" people seem to do, but we do need to be responsible and leave things in as good of shape as possible for the next generation.

I know all the "new-age" madness leaves a bad taste in most of our mouths, but if we step up to the plate here and lead by example, we can bring balance to this issue. Turning out the lights for a few hours won't make much of an environmental impact I know, but I was amazed as I drove through town to see lights on at the Conservancy building as well as in the homes and businesses of many of the people who promote all the crazy over-the-edge stuff like carbon credits and such.

While I don't believe in all the global warming hype being pushed like some new religion these days, as Christians we need to make a statement that we are willing to go the extra mile to be responsible, global warming or not. It was really no big deal for my kids and me to go without lights for a few hours. After all, we lived without commercial power for quite a few months after the fire! This was a good reminder of our blessings.

We have done quite a bit here at the KBRT transmitter plant to be environmentally responsible, from our very efficient Nautel XL-12 transmitter to the full spectrum florescent and LED lighting we have installed. Even our new electric gate opener and our generator battery charger are solar powered. The next step will be a sight to see, as I will soon begin riding a moped up and down the hill to get the mail. This will not only save us quite a bit on fuel, but will reduce the extreme wear and tear that has continued to beat on our truck as we drive the awful deteriorating roads here in the island's interior. As most of these "sacrifices" go, they seem to create wins in more than one area. Not only will the moped create fewer emissions, use less fuel and need less maintenance, I will probably have to pedal my fat self part way up the hill, so it will do my health some good as well! Plus, think of all the hilarious pictures the tourists will get as the busses fly past me peddling up the hill!

My friend Joel Saxburg and I installed the new B-exciter into our Nautel XL-12 to give us an analog back-up to the HD-R A-exciter. The physical installation of the boards was a no brainier, but after contacting Nautel's customer service department before firing it up, things got a bit weird. The exciter did not come with any documentation, and we were told everything was in the transmitter's manual. Well,

I have never seen eye to eye with Nautel's manual, and I came to find that Joel likes them as much as I do. So, Nautel being on the east coast of Canada (in the Atlantic time zone) and us on the U.S. "left coast," we have to either work late night into early morning (which is not a good situation for Joel), or we deal with after-hours tech support.

We made the call, and in about an hour we got a call back from a tech. I explained our setup, letting him know we had the A-exciter running HD-R and this new B-exciter would be set up as an analog backup. He then gave Joel a list of what needed to be done to complete the installation of the new exciter. Not long into the process, another tech called and began adding to the list. As Joel passed the directions along to me, we soon found ourselves tearing into one of the PA modules to access the gate test-point and then reinstalling it.

Joel had a 7:30 boat off the island, and time was running short as we began to question what the tech had told us to do. The list had us testing the A-exciter and then calibrating the B-exciter to it. I knew that could not be right since the A-exciter is seeing the HD-R signals while the B-exciter would be running analog only. We stopped the procedure and cleaned up just in time to get Joel back to the boat.

I have always loved Nautel transmitters, but I've got to say, since our HD-R installation, their tech support has not been as organized as it should be. Granted, our HD-R installation was done while Nautel was still figuring out the whole procedure, but that was a pretty rough deal. I think the fact that we are running HD-R was lost on them on this exciter installation. It seems like HD-R is still the strange stepchild in the family when it comes to any type of installation or calibration in one of their transmitters. We will be back on the phone with them next week and go over these steps and reiterating the fact that we are operating an HD-R exciter in the A position.

With all the daily weirdness this island brings, our transmitter plant has been operating extremely well since the fire that took us off the air a year ago. My children and I have also been doing very well. They are both back to being "A" students and have come through a lot of growing pains over the last year. Though most of our experiences have been pretty brutal ones, the results are promising as we have all become much stronger and wiser though the struggles. With all the issues this little island seems to have, God just keeps telling me to take one step forward at a time and lead by example. With everything we do here, we think "redundancy" and "plan-B," and I thank God each morning the transmitter goes on the air and every evening we say good-bye to another successful day because we never quite know what is around the corner.

Until next month, the Lord bless you and keep you; the Lord make his face shine upon you and be gracious to you; the Lord turn his face toward you and give you peace.

The Chicago Chronicles

By
Art Reis, CPBE, CBNT, AMD
Chief Engineer, CBC–Chicago

As I write this, it is Good Friday, March 21, 2008. The last time Easter came *this* early, the world hadn't even gone through *one* World War yet. To answer the next question, that was 1913 – 95 years ago! To answer the next question: Easter falls on the first Sunday after the first full moon after the equinox. The equinox was on March 21 this year, today as I write this. The full moon was on Saturday, and Easter was thus the next day. So much for the trivia department, although what we have celebrated for every Easter since the first one is not trivial. Kind of puts all the other folderol surrounding the greatest holiday in Christendom to shame, be it Easter egg hunts or the Easter bunny, don't you think? And, lest I forget, this is the latest that winter has hung around in years, don't you know? Hey, how're y'all likin' this here global warming, huh? (I love being politically incorrect….)

Things are humming right along here in Chicago. We've just finished getting a replacement T-1 line installed between Lansing and Kirkland. We're in the midst of establishing a new studio/sales office site in Rockford. We're trying to get a backup antenna project off the ground (pun intended) at Kirkland. We're in the middle of a rack replacement in Beecher. We've just started to get a security camera project up and running in Burnham. Lots to do, but not much to make a reader truly interested. I mean, how many times can you go over the machinations of an on-going fight with the phone company over line installation deadlines and rates? I mean, this is nothing compared to the stuff going on out at Catalina Island or with the great Birmingham copper capers, right? I'm getting sleepy already!

So, with all that out of the way, let's do a little future talk. Stop me if you've heard any of this before, but I think that there are some changes coming up in the radio world that I've heard little talk about. For instance, what about the impact of HD Radio? And believe me, the public is starting to get the message about that. I know, it's taken, what, five years? But it took the public nearly 30 years to get the message about FM, so count your blessings. The future is coming up faster than it ever has. Now, what does this mean for broadcasting?

Well, for one thing, as I've said before, the future of the likes of Sirius and XM are rather cloudy. The longer the government drags its feet on the process of approving the merger, the worse it looks for them. It appears that the right people are starting to pay attention to the questions that the broadcasters are asking, and more importantly, it appears that the public is starting to see HD Radio as a free alternative to the monthly fees that the Gruesome Twosome are charging, especially in this time of serious economic stress. Costs of HD radios are coming down, and the quality is starting to improve, especially now, since the original Ibiquity Radio design is being replaced by newer chipsets and technology. Don't get me wrong. Ibiquity's design was a *starting point* for the genre, but as with all starting points, nothing but improvements can follow from there. And that is now happening.

Coupled with that, as Cris mentioned in his column last month, there is a possibility of a power increase looming for the FM side of HD Radio. How much increase there is has to do with 1) what the government decides what the maximum will be, and 2) what individual broadcasters will do to keep interference to first and second adjacent channels to a minimum. That latter thought came from Cris, by the way.

Over all, the limiting factor in deciding HD's effectiveness will ultimately be the consumer-grade receivers, and not the purity of the emissions of the transmitters. To my mind, and this is an old ham radio operator talking, the individual radios are and always have been the limiting factor in virtually every issue regarding interference, other than co-channel. To my mind, there is no excuse for an HD radio receiving interference on either AM or FM from a station on a second adjacent channel. The radios are,

flat out, not selective enough. Nor are they sensitive enough, for that matter. This is a particularly thorny issue on AM, where the HD technology is pretty well maxed-out at the transmit side, and where all improvements in both HD reception and interference control are going to have to happen within the receiver. I believe that a really good HD radio can be made which will allow for HD reception out to maybe half-again, or even twice the coverage radius it can receive now, at least in the daytime. The general experience with HD reception at night isn't all that great, but again, the design of the radio can be an important factor in improving reception, even in *that* interference-laden environment. Something tells me that the redundancy of the two sides of the HD signal could be used to even better advantage with improved algorithms within the radio's software, ultimately to offer improved HD nighttime coverage, even when serious interference situations arise.

But it's on FM where HD will really come into its own by replacing marginal AM signals. How would you like to take your little AM, with the reduced power and critical DA at night, and fill in the coverage of the pattern's nulls, with a *digital* signal piggy-backed on your FM, or somebody else's FM nearby? It's being done on three stations here in Chicago, including two of the big 50 kW blowtorches, WLS and WBBM, and on suburban WJOL, Class C on 1340 in Joliet. In the case of WJOL, they're utilizing the co-owned FM's HD-*3* channel to put WJOL where that station has never gone before, namely east of town, where coverage is horrible for them. In the case of the Big 89 and NewsRadio 780, their goal is to get into the high-rise office buildings in downtown Chicago, where their suburban-located transmitters can't effectively reach. In both cases, HD-2 signals are used. And remember, ultimately, FM-HD can have up to *eight* HD programs within it. Think of the possibilities!

Once the penetration of HD radios gets to a certain level, questions will inevitably arise among some station owners as to whether their more marginal AM signals are worth keeping around. From an economic standpoint, it will make more sense for such a marginal signal to migrate permanently to FM-HD-2 or above, even if only an LMA or a buy-in of the FM facility is involved. This will inevitably cause FM station values to rise as the number of programs they can carry per signal increases (can you say, "More sales inventory?"); conversely, AM station values will probably fall, but I suggest only to a point. Once many of the smaller, marginal AM stations leave the scene, other stations, which have been held back because of interference issues with the departed signals, can increase their facilities to cover more area, increasing their value. And that is precisely why and how HD radio will find its way into the smaller markets. It strikes me that those station owners out in the sticks seem to be just too stubborn or maybe too stupid to figure that out. The ones who do figure it out soonest will succeed fastest.

"But," I hear some ask, "what about the impact of the Internet on this scenario?" My response is that the Internet as a stand-alone entity has already been compromised to a greater or lesser extent by the legal and financial restrictions being placed on it by a lot of rather greedy folks, who demand the ultimate sacrifice by those operating within cyberspace for the use of whatever they create that's put on cyberspace. It is a lot less expensive, at the present state of affairs, to keep the radio station on the air *and* feeding the Internet, rather than to turn off the station and feed the Internet exclusively. Turning the station off kinds of blows your local impact, too. And (this is the miracle), the latest research shows that the greater listenership is with the audio website that has a radio station attached to it, rather than one which does not. Radio listenership is still quite a draw, no matter how it is the station is being heard. Go figure, and then rejoice that this is so.

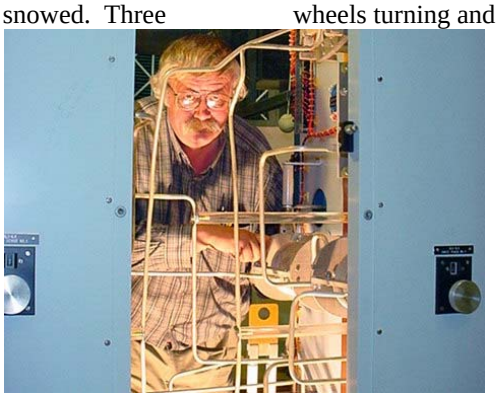
Now, having said all that, it's time to sit back and see if I am right. I for one will be fascinated to find out.

Next month: It's time to change some of the FM rules regarding grandfathering. Until then, blessings!

The Portland Report

By
John White, CBRE
Chief Engineer, CBC–Portland

Well, I thought when the NexGen training session ended in late March I would have a few days to relax and catch up. That was probably silly of me, but it is what I thought. And then it snowed. Three days' worth. It's spring, you say. It's western Oregon, you say. Doesn't matter, I just got back from Mt. Scott and dealing with the snow.



In the past, I have talked about the local connection between broadcast radio and their local audience, specifically the local station providing local programming content that meets the needs of it audience. It costs money to provide that kind of programming. Staff time adds up. It's cheap to turn on the satellite receiver and computer and walk away.

Portland is a competitive radio market with many stations taking the mechanized national programming route. In contrast, KKPZ has taken the route of working hard to bring local programming supplemented with quality national programming to our audience. The days of the old technology, DAT and MiniDisk to mention two, are over. Those are old technologies that KKPZ until recently has relied upon.

So this year Cris suggested the solution was to install NexGen with the goal to lever the technology to make KKPZ even better.

I have to be honest about that: it made me nervous. In the past, I have installed these kinds of systems ("OldGen" and Audio Vault) and found it a difficult transition. And it was usually not so much the hardware issues as it was staff issues.

I don't want to minimize the hardware issues. A system like NexGen brings lots of changes. I felt well behind the install curve as the date for the training session approached. So as that day approached, I asked the station manager to call a staff meeting so we could look at an overview of the system. Originally scheduled for a half hour, I began by providing an overview of each part of the system – what it is, what it does, and how it fits with the other parts of the system. That meeting ran nearly two hours with the staff asking many operational questions I wasn't able to answer. I could see the wheels turning and thoughts about how the system can be used to do one thing or another. Lots of questions were written down to ask when the training session started.

Now that the training is over I am very happy.

My biggest concern was the impact on work procedures for all the staff, NexGen is a lot for everyone to get their hands around. Just one example is logs. James, our station manager, and traffic both realized from the start that the tracking of the various programming elements would have to change. On day one, both James and Andrea jumped on the issue and worked out a tracking and numbering system.

From my observations, we did very well. The proof, of course, will come in the next few weeks as we transition more of the system on line.

Hardware-wise, I was quite pleased. We had some significant issues with the network, Internet connection and email. Our Internet / email was provided through a switch and none of the office computers were networked. At first, only some computers could talk to others. And the then the Internet connection was going up and down. Then email went down, and when we got it back, we could receive but not send messages. All those issues have been resolved and I will be doing a physical cleanup of the cables shortly.

The Linksys firewall that Ed recommended worked out very well. Along with the firewall, it provided the additional ports I needed to get all the appropriate computers talking to the NexGen network. I retained the old email switch downstream of the Linksys to provide email-only service to the reception and sales computers.

As we load program elements and music over the next weeks, I will be taking out some of the Instant Replays. As things move around, I will be

working over the final mounting of the gear in the control room. In the interim, I want to keep it positioned so we can fall back to the old way if we have problems.

That last comment, I think, is key to installing a system such as NexGen. Never plan to turn off one system and turn on another unless there is no other choice. It's best to plan for an orderly transition.

I have to say I am very impressed by our station staff. Only two of our regulars had some exposure to computerized systems. Just the same, everyone stepped up, took on the task and is making the system work to fit KKPZ's needs. I have to say that KKPZ has the best radio staff in Portland.

Snowy Mt. Scott

Recently, we have had two intrusions and thefts at Mt. Scott. As a result, I want to repeat some comments I made earlier on the CBC Engineering Forum.

Four incidents in the local news here recently shed some light on the problem of copper and other metal thefts. Thieves stole approximately 40,000 pounds of rolled stainless steel from a local industrial warehouse. After hot-wiring a forklift, they loaded five coils onto a large flatbed truck. Numerous reports have been in the news of telephone pole wire stripping in southeast Portland. At least one person was arrested while climbing a power pole. Port security has been increased due to multiple indigents of metal theft at the Port of Portland. Police were recently called to terminal 4 at about 1:30 a.m. When they arrived, officers found the unarmed port guard with a wound to the leg. The security guard was on patrol and walking near a pier when the shot was fired. A Special Emergency Response Team used night vision to search the area the following morning. Meanwhile, the Coast Guard and Multnomah County Sheriff's Office River Patrol secured the shoreline to the terminal. No apprehensions were made. The cast bronze statue of Sacagawea and her baby, Jean Baptiste Charbonneau, was stolen from National Historical Fort Clatsop Park. The statue was broken into small pieces and sold in Bend, OR, some 300 miles away. Even though the statue was broken into small pieces, the scrap dealer recognized the statue and called police. Two were arrested.

I suspect that each of these incidents has something different to teach us about the current problem. I picked these four from a long list of incidents for specific reasons. The common thread is the theft of materials that were until recent years safe at construction sites, storage yards and transmitter facilities.

Forty thousand pounds of stainless taken from a warehouse is not a small theft. Incidents of this size and nature suggest this problem is growing with no end in sight. Apparently the attempts to control the salvage / recycle component of this problem had no deterrent effect.

I first saw the problem of telephone cable being stripped from poles in *The Local Oscillator*. At the time, I thought that particular problem was far away. Now I understand that a target of opportunity in one place can be a target everywhere. Just the same, I have noticed that the word seems to spread quickly from place to place. I am wondering if there isn't some significant level of communication between those committing this particular type of crime.

The incident here at terminal 4 with armed perpetrators highlights something I first saw when Chris commented in December about the armed theft incident in Birmingham. After the terminal 4 incident here in Portland, security officers are now negotiating with the Port to be armed when on duty.

At KKPZ, I am working to install a perimeter entry detection system. Due to the potential of false alarms, my original thinking was to investigate perimeter alarms prior to police notification. Given the incidents of armed thieves, I am now rethinking that. At a minimum, I now think that on-call professional security should be considered, at least during the initial turn-on phase of a new perimeter security system

The last incident I mentioned, the destruction of the statue of Sacagawea, is most disappointing and I suspect it illustrates why we have this problem. Scrap and salvage dealers have been addressing this problem. In this case, the dealer in Bend identified the material and contacted law enforcement. That report resulted in the arrest of two responsible for the distraction of a statue worth thousands of dollars. The two have now been sentenced to a term of only 50 days.

Rocky Mountain "Hi"
The Denver Report
by
Ed Dulaney, CSRE, CBNT, AMD
Chief Engineer, CBC - Denver

A Pain in the Foot

By the time you read this I'll likely be "under the knife."

For the past year or so I've had some problems with severe pain in my right foot. I kept putting off the visit to the doctor's office, as I *hate* having to see the doctor! If I can tolerate the pain, then I'll just keep up my routine as usual. Unfortunately, the pain has managed to escalate to the point where it keeps me up all night. So it's time to deal with it.

I don't know exactly how long I'll be out of commission, though. I could be back at work within a week or so, or I might be out for a couple of months. They have to remove two marble-sized tumors from different spots on my foot, and do a little reconstruction of some of the nerves. I'm not looking forward to that at all! I will covet your prayers for a speedy recovery.

Spam!

Lately the level of spam into the CBC mail server has been increasing. And it's not just the usual "fantastic opportunity" stock tip, or the promise of... well, I can't say what exactly, as this is still considered a family publication.

More and more I am seeing advertising that some would consider legitimate that is getting past the Barracuda firewall. Some of these are from media related companies that would normally not even raise an eyebrow. But I still treat companies like that with the same heavy hand that I treat the snake oil salesmen that have deluged our servers.

Here's an example of something that's happened lately. A record company sent out an email to quite a few people in CBC to brag about their latest artist. That in itself isn't a bad thing, as record companies have a right to send mail to whoever they wish. And it wasn't that this artist is someone that isn't played on any of our stations. It's a name that most people would easily recognize.

The problem was that the email was sent out to dozens of CBC addresses, including engineers, managers, and corporate users. So I do with them what I do to anyone that sends out message like that... they are instantly blacklisted on our servers! And I won't just blacklist the sender; I'll blacklist the entire domain! So if frankie@valleyrecords.com (a fictional address) sends one of those emails, I'll block email to our server from everyone at valleyrecords.com!

Yes, it's a heavy-handed approach to the problem, but it's also highly effective! Further, I'll report that domain to the blacklist servers around the 'net. If enough administrators do that, then they will not only be banned from sending email to us, they'll be effectively blocked from sending email anywhere! Nothing gets the attention of a company quicker than when they are added to a global blacklist! I know, because in the past we were accidentally added to one of those blacklist servers! I got it cleared up pretty quickly, but for a few hours we couldn't send email anywhere!

So what's my criteria for deciding when someone should be blacklisted? There are only three tests I perform. First, is the email completely irrelevant to the people that were the recipients? In other words, if I receive an email about a great opportunity to interview an author about their new book... ZAP! Into the blacklist they go! Or if a producer gets an email about the latest computer technology that will benefit engineers... PFFFFT! Away into the blacklist it sails!

My second test is based on how many people in the company that receives the message. If it is generic enough that it would normally be missed by using the first test, then I'll look at how many

people within the company received the same email. There are a number of times that I've researched an email I received that seems innocuous but has been sent to nearly every email address in the company, including some that are "private" addresses (such as the email address where I receive security alerts!).

If a message passes both of those tests, then there is still one more that will get a domain blacklisted. If an email message is sent to me, and I see that it was also sent to a number of "invalid" addresses, then their domain will be blacklisted. Invalid addresses are those that have been inactive for many years, or are addresses that have never existed at the company. A good example of this was an email I received last month that was addressed to me, and to manager@crawfordbroadcasting.com! Off to blacklist-land with them!

What I would encourage you to do is make use of the ability to blacklist people as well. If you've never logged into you personal Barracuda homepage, then you should do so. From there you can blacklist and whitelist email users. Whitelisting is basically granting permission to the server to permit someone to email you directly regardless of the domain or email address of the sender. So if you want to be sure to always get messages from very@important.com, you should put that address in your personal whitelist. Please note, however, that there is never any need to whitelist anyone in the crawfordbroadcasting.com domain! You'll always receive those messages, whether you want them or not!

Of course if you have any questions about the way we handle the email system, you can always write to me directly. Trust me, I won't blacklist you!

The Sky is Still Falling!

As I was contemplating some of the things I wanted to write about this month, the March 26th edition of *Radio World* newspaper arrived. As usual, one of the first sections I read is the "Readers Forum." Call me a glutton for punishment, but I always love to see what the latest Chicken Little has to say about HD Radio.

And I wasn't disappointed at all! Bernard Wise of Energy-Onyx is the latest HD Radio naysayer that has written to RW. As I was reading his completely inaccurate rants, I had to keep looking at the calendar to make sure the year was 2008 and not 1908!

How do people like this manage to stay in business? The one quote that I laughed the hardest at was, "Energy-Onyx shipped 255 broadcast transmitters in the year 2007. None of these customers had an interest in HD Radio." Of course they didn't! And I wouldn't expect that people that went to a Yugo dealership in the 1980s had any interest in a high-performance automobile, either!

One other quote that was just as moronic was, "HD Radio has an audio frequency response of only 5,000 Hz." Talk about someone that doesn't have a clue about HD Radio broadcasting! And this man is the *president* of Energy-Onyx. No wonder they are a small-potatoes company. That sort of horse-and-buggy thinking will keep their company in the dark ages for many years to come.

This is why I have always applauded companies like Nautel and BE. They stay near the edge of the technology curve and are always looking for ways to provide what the customer needs. I'd have never bought an Energy-Onyx transmitter in the past, simply because they always seemed rather rickety, but a letter like that one in a major broadcast publication insures that Energy-Onyx will be little more than an asterisk in the appendix of broadcast history.

Speaking of HD Radio...

Last month, Amanda and I had one of the APT Oslo digital STL units here in Denver. We did quite a few experiments during the month of March, and what I heard – or, more apropos, didn't hear – impressed me!

One of the biggest problems that we face for AM HD Radio broadcasts is the limited bit rate that it offers. Anytime you send a piece of audio through multiple layers of coding, you introduce artifacts known as "transcoding" into the chain. Well, when Kevin Campbell from APT was here for our SBE meeting in January, I asked if he would be willing to send an Oslo to us so that we could make some side-by-side comparisons in an AM HD-R air chain of the difference between the APT-x algorithm and the MPEG algorithm that our Harris Intraplex units use.

I was very impressed at the results! The Enhanced APT-x algorithm was much smoother and "played" better with the HDC AM coder. A lot of the artifacts that were obvious in the vocal range on the MPEG codec vanished when we switched in the Oslo. I kept the bit rates on the stream the same, 384 kbps, just to make things fair. But I also experimented with higher bit rates and even linear audio through the Oslo.

That became another test for us. You see, the Intraplex has always had audio dropouts and chirps due to the very noisy 5.7GHz STL path. The Oslo, on the other hand, had only a couple of dropouts, and these were due to problems in the network switches and not necessarily a problem with

our Motorola Canopy link. However, the Oslo functioned perfectly, even when I switched the audio over to linear! We're talking a 1.2 Mbps audio stream instead of a 384 kbps stream. The Oslo showed a few errors, but the error correction in the unit kept them from being noticeable on the air.

Needless to say, I was extremely impressed with the Oslo. When it comes time to rotate the Intraplex units out, my goal will be to replace them with whatever APT is manufacturing at the time. It's obvious that these guys know what they're doing!

CBC-Denver's Massey Ferguson Tractor

Green Acres is the Place to Be!

Last month we bought a Massey Ferguson 180 tractor for use at our transmitter sites. It's an older tractor, but it still runs great. We'll use it for mowing the weeds at the sites, leveling the roads and clearing the snow in the winter.

One issue that came up, though, was the trailer that we use for hauling things around. It is supposed to be rated at 7,000 pounds. The tractor weighs around 6,200 pounds, so it should have been right at the limit for the trailer. Unfortunately that wasn't the case. When we loaded the tractor on it for the first time it caused the loading ramp to buckle and compressed the springs to within a half inch of bottoming out. So I've had to request a little larger trailer.

Until next month... Press On!

Digital Diary
by
Larry Foltran
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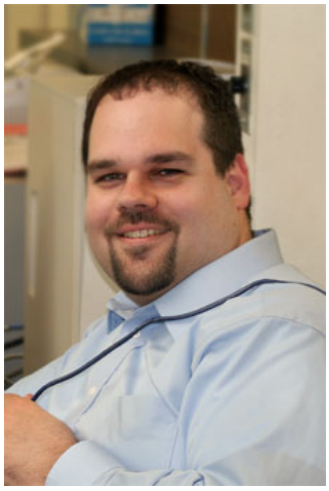
With a newborn in the house, I again find myself searching for creative ways to soothe a crying baby. During one recent rendition of, "Let's see how goofy your dad will get to make you calm down," I began singing the theme song from the original Mickey Mouse Club show which resulted in very perplexed looks from my two other kids. After a few moments of watching the gears in their heads turn at blurring speed, my daughter asked, "I don't remember that song from the Mickey DVD we have." I realized that they had never seen or even heard of the Mickey Mouse Club before this moment and we had officially opened the doors to another opportunity for making me feel old.



With the baby finally quiet and seemingly listening intently, I spent the next several minutes trying to explain the Mickey Mouse Club to some very curious children. The bewildered looks on their faces were a clear indication that they still didn't get it. Having been brought up with the philosophy that it's better to show than simply tell, I decided to boot up the computer and see what I could find on YouTube. What started off as a simple discussion turned into a 45-minute journey through my childhood memories. I had the opportunity to give my kids a taste of the programs I watched as a child. From cartoons to toy ads, I felt as if it was Saturday morning and I was again sitting in front of the TV in my PJs as I did many years back. Later that evening, I realized that my kids

have been born into a high-tech world of on-demand media, drastically different from when I was their age. The Internet now provides access to video, audio, or photos relating to just about anything imaginable. I remember my parents telling me about some of their favorite programs from before I was born. My dad would try to include the smallest of details in hopes that his description would bring me as close as possible to actually have experienced it first hand. In vast contrast, my children are now able to experience the shows I watched first hand as I did years back. I've even been able to find some snippets of programming my dad described many years back as well, although at times his descriptions were much more vibrant and exciting than the actual show.

On-demand media has also proven itself as a valuable teaching tool. During another recent evening discussion with my kids, I was trying to describe the space shuttle and how it launches into space. Rather than pulling out a book of shuttle pictures, I was able to show them videos of several different shuttle launches, videos of the crew while in orbit, and shuttle landings.

So what can we expect in the future? The quest for instant information seems to be expanding every day. It wasn't too long ago when you'd have to drive to a video rental store to select from a multitude of movies on wall racks that seemingly stretched on for miles. We can now quickly order movies online from a vastly greater pool of titles and have them delivered to our home within days. Not fast enough? Some services now offer you instant movie downloads allowing you to watch the movie of your choice within minutes of your selection.

What about books? In the near future, can we expect to see cyber-libraries replacing their brick and mortar counterparts? Digital books have recently become available to the public, allowing users to purchase and download numerous books to their specific reader hardware. I certainly wish I could have carried an entire encyclopedia collection with me to school each day.

Downloadable on-demand audio is something we've already grown accustomed to ("that is so 2004"). From an artist's latest release to Presidential addresses, we can seek out and download audio mere minutes after it has aired for the first time.

Instant information at any time, day or night. That seems to be the path we're on, and in many cases, we've already reached the destination. Even beyond media distribution, we've become accustomed to near instant gratification. My kids have never had to wait for an audio cassette to rewind to a specific song. They've never had to wait 40 minutes for a TV dinner to cook (TV dinner? What's that?). They sometimes act as if waiting two minutes while heating something in the microwave is cruel and unusual punishment for them. Advances in technology seem to propel us faster and faster and, in the process, it makes many of us less and less patient at each step. Kids seem to be moving from one thing to the next at a faster rate each day and I'm sure parents probably thought the same thing when I was growing up. Perhaps there are some things that haven't changed.

…until next month!

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KKPZ • Portland, OR
1330 kHz, 5 kW-U, DA-1
KLZ • Denver, CO
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KLDC • Brighton - Denver, CO
1220 kHz, 660 W-D/11 W-N, ND
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WYDE-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT
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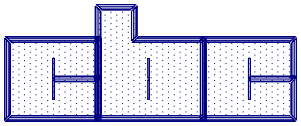

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