The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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A Proper Orientation

Editorially speaking, the first of December is an odd time. As we are putting this issue of *The Local Oscillator* together, we're all preparing for the Thanksgiving holiday and celebration, and yet this is the last issue before Christmas and indeed the last issue for the year. As a result, some of our columnists write about thankfulness, and some write about the birth of our Savior. As far as I am concerned, either is okay as they go hand in hand.

It seems that all we hear is bad news anymore. There is the economy, there is the deepening economic mess and national crisis perpetuated by congress and the administration, there are troops dying in Afghanistan, troops stuck in Iraq. People you know are out of work. Our local governments are struggling to keep up in a time of flagging tax revenues while we all struggle under an unprecedented tax burden with nothing but the promise of more and higher taxes on the way. Health care is expensive and we do need real reform, especially tort reform, but instead, disastrous and socialistic health care reform legislation that does anything but really reform health care **is** being pushed through without regard for public opinion. And I fear it's only going to get worse. Indeed we have a lot to be concerned about these days.

But think about this: You have a job. You have food on the table, clothes in the closet, a roof over your head, wheels in the driveway. You have family. You have friends. You have freedom to choose your own path in life, your vocation, your hobbies. While it's harder than it was in years past, in this nation you can still go as far as you want, as far as your education, motivation, drive and efforts will take you. You can worship at the church of your choice, and while there is clearly a growing persecution of Christians from even the highest levels of our government, it's nothing compared to the Muslim world and many third world countries. Those of us who work for Crawford Broadcasting Company are blessed with a truly Christian workplace with all that entails. We are blessed to work for a Kingdom company that does not answer to shareholders or banks, that is not constantly maneuvering to find a way to either stave off or make debt service payments for another month or quarter.

We have a lot to be thankful for, no matter what goes on in the world around us. If anything, all the *stuff* happening out there should heighten our appreciation for all we have been blessed with. This time of year, those of us who are in Christ should be especially thankful for our Savior, Jesus Christ, whose birth we celebrate. The Scriptures say that God lives in inapproachable light. He is the self-existent Creator of the universe, a consuming fire, and yet Jesus, in whom all the fullness of the godhead dwells, left all that behind to become fully man and walk in our shoes, eventually giving up his life for us so that we might live.

Don't lose sight of that in this chaotic world. In everything give thanks. Doing so will keep you properly oriented, and while you still have to live in this world, you don't have to be overwhelmed by it.

Projects, Projects, Projects

Those of you who really know me know that I tend to be a little obsessive about neatness and organization – a place for everything and everything in its place. So it would likely be with some surprise that you might view my office right now. There are folders, drawing sets and scribble-covered legal pads all over the place – on my desk, on the floor, on chairs, the drafting table, even the sofa. So why all the mess? Simple: we have a lot of projects going on right now.

Every folder contains a project or part of a project. Despite the chaotic appearance, it's all very organized (but I still have trouble finding stuff from time to time). Some of the projects are:

- Building project in Portland – we are converting excess space in our large Mt. Scott transmitter building to studio and office space and will this month consolidate our entire Portland operation there.
- Tower project in Portland – two insulators on one of the large free-standing towers have cracked and will shortly be replaced.
- Nighttime upgrade project at KCBC – as soon as the FCC grants the application, we will upgrade from 1 kW night to 4.1 kW with a different directional pattern.
- New transmitter site for KBRT – we are in the early stages of developing a 27-acre piece of land in the Santa Ana Mountains of Orange County, dealing with electrical power, NEPA, NPA, FAA, FCC, Forest Service, Orange County Zoning, O.C. Planning and many other agencies and jurisdictions.
- Studio project in Denver – in March, we will begin building out new studio and office space in a high-rise in the southeast part of Denver metro, including three new licensed 18 GHz microwave links.
- Moment method models – we hope to get a number of our eligible AM directionals modeled and licensed pursuant to the new rules in the coming year.
- DA project in Birmingham – in connection with the above, we are planning to upgrade the sample system at WXJC with tower-mounted loops and isocoils.
- Multicast projects in Chicago, Detroit and Birmingham – we are using our multicast capabilities to extend the coverage of some of our "weaker sister" AM stations in the same markets.
- HD-R projects at several of our AM stations – first-generation HD Radio generation equipment is being replaced with the latest and greatest equipment that does not employ hard drives and operating systems.

All that is in addition to all the regular stuff – maintenance, repairs, administrative, budget, payables and all that.

All our engineers are busy, too, many with their parts of the above-mentioned projects while still keeping up with the day-to-day regular tasks (which were enough to keep them plenty busy without the additional load).

No one will dispute that the radio business is down these days, but our part of it – engineering – is booming. We are having to be more efficient, do more with less, economize and be ever vigilant for ways to save money, and this has increased our workload considerably. But that's what we do, and for the most part we do it well.

There is no light at the end of the tunnel just yet, and there likely won't be for some time to come. But we'll press on, undeterred, content with whatever daily gains we can make and doing everything as unto the Lord, thankful every day.

While we're usually winding down this time of year, this time is different – we're "winding up." And it's clear we'll hit the ground running in 2010.

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

Hello to All from Western New York! In the November 4 edition of *Radio World,* there was an interesting article on the viability of AM radio in today's economy. The article, written by Randy Stine, pointed to the fact that not all AM stations are on the brink of financial or listenership failure. There are AM stations in

our country that are as financially sound as they have ever been, even in today's troubled times.

But how can this be? We are living in a technological world, where the listener has come to expect near live quality sound from the broadcast station. Until HD Radio was entered into the equation, AM radio had

virtually nothing to offer these audiophiles, but yet some AM stations were topping the Arbitron ratings in their markets, even over higher powered FM stations in the same market. You wonder why, when we have so many different listening choices, would anyone *want* to listen to AM?

The answer has been in front of us all along. Some see it, but most don't. The answer is *content* – providing the listening audience what they want to hear! There is very little individuality in today's radio. Stations in Podunk, Arkansas are trying to sound like Los Angeles stations, who try to sound like New York City stations, who broadcast to a specific audience in their locale. We're talking cookie-cutter formats here. What works in L.A. doesn't necessarily work in Chicago.

When I began my radio career in the late 60s I worked at a little 1kW ND daytimer in western Kentucky. Our AM coverage area was about 50 miles any direction from the transmitter site, and the 10kW FM station covered about the same territory. We couldn't give away advertising time on the FM station; nobody wanted to spend their advertising dollars on a station nobody listened to. The AM supported the entire operation, and was what today we call "block programming" oriented. At that time, each jock (or personality, as they are referred to today) was responsible for the content of his show. At sign-on, usually at 6:00 AM, you would hear news, farm reports, updated weather forecasts, more news and farm reports, and if time allowed, maybe a country tune or two. This went on until 10:00 AM when the next show started, which would be top forty music.

Our station was located in one of Kentucky's largest farming counties in the state. Our listeners depended on hearing specific news related to the farming industry, such as commodity prices or new ideas on how to operate farms at a profitable level. Radio was the quickest medium in which to disseminate the information the farmers needed, and they could listen while on the go. Either in their trucks or on the tractor, that information was there for them. Advertisers would line up to get their ads on our station; in most cases they were associated in some way with farming or marketing farm products.

Programming that appeals to the listening audience, content that they want and need to hear – that is what AM radio has been missing for some time now.

Is AM radio dead? I don't think so, but as long as station owners and programmers snub the idea that money can be made with an AM station, it will never grow. I remember back in the 1980s at the station where I worked, no one wanted the responsibility of programming the station. I accepted the challenge and after much research into the listening trends of that time, decided that country music would be the main focal point of the format. While it got off to a slow start, over time it began to materialize into a moneymaking operation, matching almost dollar-for-dollar with its sister FM station.

We were entirely local, focusing on news and events which affected the lives of the people within our listening area. We did sports remotes for the local high school teams, which proved to be a big winner in the sales department. Whenever a new business opened in our area, on opening day, our van showed up and we did a free remote broadcast promoting the event. There was never a time that this did not result in that business signing advertising contract with us. We made our presence known within the community, showing up at nearly all public events, talking with listeners and listening to what *they* had to say about the station. Their needs and ideas were important to us, and we listened. This philosophy helped us to grow and mature into a medium that far surpassed our expectations, not only in the marketplace, but financially.

Is AM Radio dead? With the technological advances we have today, AM radio should be booming, if only there were someone who would listen to the public to see what their listening preference is.

WDCX-FM – Buffalo, WDCX(AM) / WLGZ-FM – Rochester

As last month's column went to press, at WDCX-FM, we were experiencing a failure with our FSi-10 HD signal generator. Joseph Huk in Detroit loaned us his spare unit, and it was reprogrammed and put into service, but I still could not get the HD up and running. Hiding behind the FSi-10 problem was a problem with our FXi-250 exciter, which did not show up until I got a working signal generator in place. Joe again came to our rescue and shipped his spare exciter to me so I could get our HD-1 and -2 stations back on the air. I have since received the repaired FSi-10 back from Broadcast Electronics, but we're still waiting on the exciter to come back. BE found that the processor on the motherboard of the FSi-10 had sustained significant damage due to a failure of the cooling fan located directly on top of the processor. As far as the exciter is concerned, it was having trouble communicating with the FSi-10, although there were no fault indications noted on the unit.

At WDCX(AM), I had attempted to install

our new Nautel IBOC exporter plus and exciter on Sunday, November 1, but I was unable to obtain a lock on the HD signal. After many hours of adjusting the phase delay with no lock indicating on the modulation monitor, I gave up and decided to try again the following Sunday.

After discussing the alignment procedure with Cris during the week, we decided that I should start from the very beginning with the IBOC alignment procedure. I found that the adjustments on the IBOC exciter were off from the initial settings that were obtained when the unit was first installed. I set the operating voltage on TP8 of the PDM driver to 1.96 volts DC, which was off by +0.16 volts, and I also found that the duty cycle on the slicer bias was about 10 percent higher than the recommended setting. Once I went through the initial setup completely, I was able to obtain lock on the HD mod monitor within a matter of minutes. The out-of-band emissions were a little off, so slight adjustments were made to the mag/phase delay and mag DC offset to obtain the proper output spectrum on the spectrum analyzer.

While driving around checking the HD signal, I immediately noticed a big improvement in signal strength, especially while driving under bridges and under high voltage lines across the road where I would normally lose the HD signal. To switch between presets (day and night) I simply installed two 24 volt KHU-style relays in parallel with the switching channels of the remote control that automatically switch between day and night modes. The KHU relays supply the necessary closure to switch between presets on the AM-IBOC.

Operations have been running smoothly on WLGZ-FM, with no major malfunctions to report on. Last month, our transmitter site manager, Joe Fleming, had an exterminator come by and spray around the buildings at the site, as we were being invaded with Box elder bugs. They look similar to a lightning bug, and get into everything and everyplace there is warmth. We get these every year when the weather starts to turn cold, and this year is the first time that American Tower has had the site sprayed to kill these pests. In past years, I have tried to get the transmitter building sealed up as much as possible to keep them out, but they always seemed to find a way in. This year, cleanup after the invasion was a snap, just a wet/dry vac to suck up all the dead ones from the floor and transmitter filters.

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 have a very Merry Christmas!

The Motown Update

By
Joseph M. Huk, Jr.,
P.E., CPBE, CBNT
Chief Engineer, CBC–Detroit

Engineering Status and Life in Detroit

Last month, we had been researching using the local cable company for Internet service. This month, we tried an experiment of using a cellular-based EDVO card and service from a local cellular provider.

I have been using an EDVO card and service from a local cellular provider to provide Internet service to my home. Until recently, in my rural area, DSL was not available from my local phone company. I have just recently obtained DSL service at my home and no longer need the wireless Internet service. So, before cancelling the service, I figured our IT manager Larry Foltran and I could try an experiment to see if splitting the office LAN from our audio streaming and using the wireless router for Internet would help our network performance.

In general, we both agree that the use of the EDVO wireless service only slightly improved the speed of surfing the web. However, we seemed not to have the momentary outages like we had under the old configuration. The service is approximately $60.00 a month and does not support reliable Voice over IP (VOIP) services. So it would not completely solve our needs or issue. However, it was good to know that a little more bandwidth seemed to make the system work more smoothly. We are going to continue to investigate DSL

providers for service and see if we can find a happy medium between performance and cost.

I teach broadcast operations, on a part time basis, for Adrian College in Michigan. This is my first experience teaching. My mother was a teacher in Detroit, for Detroit Public Schools, for 30 years. She taught 2nd grade most of her career. Her typical class size was about 30 kids. I have no idea how she was able to remember all the names of her students. I only have eight in each class, and only now, towards the latter half of the course, know their names. My mom was truly gifted in that way. I really think the teaching goes both ways. I find my self having to read material I have not reviewed in years. So it helps me reinforce helpful concepts. In turn, I hope to share this wisdom with my students. I find myself being teacher, researcher, diplomat, and councilor all wrapped up into one package. There are so many things that I would have liked to do better this term but always seem to run short of time. The professors I work with say that every term is a learning experience.

Being in this academic environment, I think, helps me with my full time job here at Crawford Broadcasting. I find that the same concepts and issues the students face also apply to our station's personnel. And the reverse is also true. It is truly a very synergistic set of worlds.

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

News from The South

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

Rain... As Usual

In the past, I've mentioned that Alabama has four seasons: Almost Summer, Summer, Still Summer, and February. This year, though, we've actually turned a little cooler than normal. We've had highs in the 60s and lows at night in the 40s. We've even had a frosty morn or two, making some of us wonder (hope?) (dare to believe?) that we might eventually get some of the white stuff that Cris and Amanda enjoy out in Denver.

We did manage to make it through the year without a single full-blown tropical storm. Ida came through a few weeks back, causing a good bit of flooding and a few scattered power outages, but nothing like we experienced with Ivan and Katrina a few years ago. I'll take it. Of course, as I've related (whined about) in these pages for the past few months, we've certainly had more than our fair share of rain. This is the wettest I can remember it being since I moved to Alabama in late 1998. That's probably good for the lake levels, but it has gotten old at times.

As a result of the endless rain, we're way behind on some routine maintenance at our transmitter sites. The Inimitable Danny Dalton™, he of New Tractor and Various Farm Implement Sciences, has been delayed repeatedly on doing maintenance both at 850 AM in Tarrant and 101.1 FM in Cullman. He says that he'll get to us this week – with Thanksgiving coming up as I write this – but, with no offense intended to Sir Dalton, I'll believe it when I see it.

The Inimitable Ms. Scotti

Many of you have met Laura Scotti. For those who haven't had the pleasure, she is a whirlwind of energy and encouragement who has managed to turn things around here in Birmingham. It's a welcome and pleasant change. I know I'm "just an engineer," but I like it when my stations are doing well. I get a sense of pride and accomplishment out of it, even though my job is just to keep everything on air so that Laura and Company will have something to sell.

My hat is off to her. Laura, you're a pleasure to work with and I ain't ashamed to let anyone know it! Heartfelt thanks go to Mr. Crawford as well for sending her to Birmingham! In an economy in which many station groups are losing money, with management that has been reduced to muttering, "Whatta we do now?" she's a true blessing.

But Beware The Nickels And Dimes...

Having said that, the economy is a concern. What we have to watch out for, as an industry, is everyone and his/her brother trying (in some cases, desperately) to replace lost revenue as sales decline and budgets tighten in general. For years, radio has paid a tithe to BMI for every song aired; I've said many times (as have you!) that the way that it's calculated is patently unfair. Whether you're playing Top 40 or Southern Gospel, you basically pay the same. Whether you have 1,000 listeners or 10,000,000, you're going to pay a rate that's based on your market and coverage. But beware: now the RIAA is pushing for royalties to performing artists as well. Everyone is looking for an extra nickel or two in these slender times.

As engineering managers, we have to keep an eye on costs as well. I've trained Todd and Jimmy to pull a defective part and to do a Web search on it to obtain as much information as possible. Even just entering the part number, if that's all you have, can eventually lead you to a data sheet that will help you come up with an acceptable replacement (a substitute, if need be). For example, the LCD display in one of our Adtran TSUs died, and all we had on it was a single part number. A web search gave us the manufacturer, the data sheet, and eventually, a compatible $20.00 replacement available from Jameco.

Digikey, Mouser and Jameco all have online data. You can save a lot of money by browsing these data sheets (I've built up a library of said data here on a central server where we can all share it), looking for replacements, even finding ways to tweak and tinker to get more out of the equipment.

But there are cases where we're locked in with no choice. One great example is strobe tower lighting. Thanks to an FAA ruling that you must use "approved" replacement parts (which is just another way of saying, "you must order from the original manufacturer"), we have no choice but to pay whatever the manufacturer chooses to charge. We recently ordered the lamps for all 12 stations on the 1300' tower at WYDE-FM in Cullman, and at $750 per lamp (plus shipping!), it adds up to a pretty penny in short order. This galls me because I know that I could sub a different lamp for a fraction of that cost ($250 each, when I checked last year), but the FAA says, "No." We have no choice.

Vendor lock-in is another big problem. I've ranted and railed here in the past about how equipment manufacturers are slowly but surely moving away from field-repairable equipment, instead preferring expensive module replacement. If it's a unique module, with unique, difficult-to-sub parts, and with little or no service information, what are going to do? Once again, you have no choice but to pay the piper.

Then there's HD-R and PSD... but I'll let Todd cover that in a moment.

A New Firewall for Amanda

The Linux distribution that we were running on the firewall machine out in Denver, OpenSuSE 10.3, was nearing end of life. We knew that we'd at least need to upgrade the operating system. But after looking at the age of the machine, Cris and Amanda decided to just replace it. A new Dell PowerEdge was sent to us here in Birmingham in early October, but thanks to all the problems we were having with WYDE-FM at the time, Todd and I were unable to devote much time to it. A few weeks back, after a few pointed hints from Cris (ahem), we finally finished it up and shipped it out there.

Once it arrived in Denver, Amanda connected it in place of the old machine and it appeared to work – at least in part. Some of the NAT assignments (the port mappings that allow us to access different servers on the internal network from the Internet) weren't working properly. Todd and I were able to go into the machine remotely to see what was going on, and after a good bit of head scratching, I discovered that there was a bug in the YAST firewall tool. It seems that once the list of port mappings becomes longer than a certain number of characters, it just snips off the remainder and tries to make sense of what's left. The result is a firewall that essentially screams, "You want me to do *what*?" and then runs screaming into the shrubbery.

While we were working on the firewall, in one of those evil coincidences that seem to plague broadcast engineering, Amanda had a wireless access point go bad, which caused additional problems. She bought one replacement, found out that it was incompatible with some of the laptops out there, took it back and bought another. That one has problems, too, maybe something at the site. But that's her story and I'll let her tell it; the important thing is that we eventually got the firewall working and that life is good. For now.

Next on the list to be upgraded are the corporate FTP server, the corporate Web server and one other PC out in Denver. It's always something... but now, I'll turn the remainder of this month's column over to Todd. I hope all of you had a great Thanksgiving and have an even better Christmas. Until 2010, God Bless you and God Bless America!

Komputers is Software Stupid
by
Todd Dixon, CBNT

We've all heard of the popular "KISS" principle: Keep It Simple Stupid. But I was reintroduced this past month to its buck-toothed cousin in the computer world, Komputers Is Software Stupid. We are surrounded by computer processors in our business that are ho-humming their way through existence, and we may be missing an opportunity to harness more of that power and make ourselves sound better in the process.

The incident (still continuing) that brought me face to face with this alternate principle has been the reinstatement of our HD-2 multicast channel and adding an HD-3 into the mix at WDJC-FM. We had allowed our importer license to lapse in 2007 because we were simply rebroadcasting WDJC's primary HD signal on the HD-2 and it was an unnecessary expense to the company. Earlier this month, we were given the green light to add not only an HD-2, but also an HD-3 back on WDJC's digital signal. After conferring with Stephen and getting a license key from Ibiquity, we upgraded the software from BE to their current importer version (3.0.5). We were coming from version 1.1.0. Pending a couple of issues with the upgrade and some calls to BE, we were up and running with audio on both multicast channels. "Wow," is all I can say. My recollection of setting up version 1.1.0 was that it exhausted all five of my functioning brain cells. Importer version 3.0.5 was quite the opposite. Not only was it simple to install and understand – the time investment was greatly reduced and we are doing more with the same pieces of hardware.

I have found that to be true in so many areas of broadcast. We have equipment all over our physical plants that do specific jobs. The unit's overall function doesn't change much, but manufacturers are continually upgrading their firmware for the units so that they might be more complete. I've had personal experience with upgrading Telos Zephyr and 2x12 units. Also, I have updated Comrex Matrix units to more functional firmware. The result in each case has been improved audio performance. What about our industry standard Audio Science sound cards? Audio Science is always improving their drivers and enhancing what the hardware is capable of doing. The result is almost always improved reliability and superior audio.

Of course, everything near the cutting edge does not always turn up roses. Sometimes there is a Ginsu knife among the pretty flowers. It is always a good thing to overprepare yourself for firmware upgrades to hardware. Be aware of each step in the upgrade process. Know what the upgrade promises to deliver and if there is a way to "regress" back to the previous version (and how to do that). Also, you need to know that some upgrades can inadvertently cause you great pain. One example of this is that NexGen doesn't support the "bleeding edge" version of the Audio Science sound card drivers. Finally, changing for the sake of change can have detrimental consequences. With regard to firmware, you may end up with a proverbial "brick" – a piece of hardware that will never perform what it was intended to do ever again.

This is certainly the case among computer operating systems as well. The programming world does not sit idly by and allow the world to soak in their last "bits" of genius. Software programmers are continually bettering their products to make our computing experiences better. In the world of Open Source software, about every 6 to 8 months, most of the major distributions are releasing new versions of their operating systems. It is amazing to see the innovation that each distribution pours into these new software bundles. Yet, some of those versions are not worth the bytes they are encoded on, and don't get me started on the closed source Microsoft Windows Vista operating system – although, from what I understand about the new Microsoft offering (Windows 7), it is chock full of new features that run better than its predecessor. In fact, I have heard that it is supposed to be what Windows Vista was promised to be.

To complete the "continuing" HD story from above as a warning to all, the audio was performing beautifully. We had expanded our digital bit stream to 120 kbps (HD-1 got 48k, HD-2 got 48k and HD-3 got 24k) and all the levels were good. We have never had an issue with MPS data on our primary digital channel, NexGen has always simply worked, but getting SPS data on our multicast channels from NexGen was another story. Enter the new BE "Dashboard" software and an upgrade to NexGen we had done earlier in the year for our AM HD data (Ibiquity PSD), simple setup and all we had to do was

forward NexGen data to ports 4442 (HD-1), 4444 (HD-2), and 4446 (HD-3) on the importer, right? Some of the more experienced engineers already know the answer; the problem is still not resolved. Using port sniffing software (Wireshark) and Hyperterminal, we know that the data is getting there and it is human readable when it gets there. So where is the issue? Apparently the issue is a matter of only a few thousand dollars to make NexGen and the BE importer talk to each other! Of course, our only choice is whether to give it to BE for their TRE software or to RCS for their Importer software. All I could say once again was, "Wow." It makes very little sense and has left me in complete SPS data frustration.

No matter where you are at, software and firmware offer a brave new world to those of us looking to get the most mileage out of our hardware. The information to look like a true propeller head or a dunce is available at your local Internet search engine.

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

We have had a problem that has cropped up over the last year that caused us a major off air incident on Labor Day just a few months ago. The problem is with the Harris Intraplex multiplexer system that we use to connect the studio to the KJSL transmitter site. The problem occurs on the main bi-directional audio card that we use to send the station program audio and a satellite feed on the return.

Occasionally the card will "lock up" and the output will be a loud continuous buzzing sound. Most of the time this would occur on the backhaul feed of the satellite programming. This would be bad enough because it would show up when going to a live satellite program. But we had an alternate feed of this on another card, so we could go to that once we discovered it.

Worse yet would be when it would happen on the opposite feed and it would affect the on-air program no matter what the source. This would not trip the silence alarm since the transmitter was still being modulated rather loudly. We had an alternate feed that we could quickly switch to through the remote control. However, figuring out that it has occurred is the biggest problem. It would always seem to occur overnight when no one was on duty, so we wouldn't find out about it until the morning.

The problem was only on the one card of the multiplexer, and therefore it would not trip the alarm relay on the multiplexer. The only way to detect when this would happen would be for someone to actually hear it on air coming from the transmitter. Since we don't have the operations staff that we once had and most of the monitoring is done from our pre-delay feed, the way this often is discovered is by listener telephone calls. Not the way you usually want to find out about on-air problems.

I suspected that the problem was with the one of the two audio cards in either of the matching multiplexers. Since I had spare audio cards, I experimented with replacing the cards one at a time to see if that would solve the problem. Even though it could be months between incidents, the reality is that this didn't solve the problem.

It all hit a head this Labor Day. With the station on complete walk-away mode, there was no staff on duty. It once again locked up in the direction of the programming to the transmitter site. Unfortunately, with no one on duty, it was not discovered until the next morning.

This was very embarrassing to explain to a client whose program got totally annihilated. I was trying to find out a way to fix it so it wouldn't happen anymore, but until the problem was resolved I needed a way to detect when it did occur without having to wait on a listener to call. If I could find out quickly when it was happening, I could switch to the alternate feed to minimize the off air time.

I scoured the Internet looking for equipment that would detect unusual audio on the air. No such luck. I really had to put on the proverbial thinking cap to solve this one and to do it cheaply as well.

Examining what would take place when the "locked up" audio was on the air, there were two

characteristics: one, the audio was considerably louder than the normal program audio, probably somewhere between 10 to 20 db louder, and two, it

was continuous. It was a loud "buzzer" type sound on the air.

Borrowing on and modifying an idea from Stephen Poole, who had a similar problem that he was able to resolve with a silence alarm, I came up with a plan that I believe would detect the occurrence within a couple of minutes of it happening.

I would use a silence alarm in reverse. I purchased an RDL ST-ACR2 audio sensor and then added an additional potentiometer to the setup. I connected this to the analog output of the multiplexer audio card that was having the problem.

Using the trim pot on the ST-ACR2 and the additional potentiometer, I set the audio level going into the sensor so that the "audio on" LED would turn on just a couple a times per minute. I tied the normally closed side of the built in relay to a status channel of the remote control. I set this status channel to go to alarm state, thus causing the remote control to call out with the alarm. I set the alarm delay to the full two minutes.

The theory behind this setup would be that since the locked-up audio was considerably louder and continuous, the locked-up audio would be the only thing that would cause the audio sensor alarm to close its relay for the two minutes necessary to put the remote control into alarm state. If the audio level was set properly, normal program audio would trip the relay on loud peaks but not long enough to trip the alarm at two minutes.

I installed the device a couple months ago. Fortunately, there have been no "lockups" since then. I have had some false alarms causing me to adjust the audio in to the sensor to a lower level. However, I don't want to adjust the level so low that it won't detect when an actual event occurs, so I am putting up with the occasional false alarm.

I believe that when an actual even occurs, I will be able to then set the level on the trim pot properly so that I will not have any false alarms. While I don't want the "lock up" to occur, it would help me to get the level set properly.

For less than a $100, I was able to come up with a way to detect the problem quickly. I am fairly positive this solution will work, even though I don't have proof at this time. I will update you on whether this works or not in the future.

Catalina Tales

By
Bill Agresta
Chief Engineer, KBRT

Greetings from Santa Catalina Island! This has been a productive but relatively quiet month here at the KBRT transmitter plant. Things have geared down for the winter, and amazingly, it is already time to look forward to a new year!

I have continued my move forward with the usual ongoing cleaning, weeding and so forth, and the entire property continues to look and function well, despite still not having reliable Internet, phone or T1. AT&T is still playing with the old broken node and continues to drag its feet on replacing it. Much of the time I am forced to go up on the hill above our building, bring my laptop and use my Verizon wireless modem to gain Internet access. The same must be done from time to time to make a phone call using my cellphone. Sadly, we do not have cell coverage of any kind here at the building because we are blocked by a hill

that sits between us and the Black Jack communications tower where the wireless companies have their sites. I have tried and tried to bring that coverage down here to our building using passive repeaters, antennas with long coax leads and so forth, but nothing has worked thus far.

The Conservancy is at it again, this time giving contraceptive drugs to the local buffalo. This has stirred quite a bit of anger among the locals here on the island, and most of the major mainland newspapers have chimed in now. They continue to play with Airport Road, covering it with layer after layer of their crazy concoctions, yet it is still just an old dusty dirt road. Even the local buffalo got tired of all the road blocks and hassles. Maybe that's why they are now getting injected with contraceptive drugs. As the show goes on here, it continues to get more bizarre by the day.

The weather here continues to tease, threatening rain, but so far, nothing more than a few sprinkles. I have prepared this year better than most, as I was expecting a very wet winter, yet here we are, almost Christmas and nothing more than a few sprinkles.

Despite all the improvements we have made around here, our fire department was more stringent than ever before during our last fire inspection. We always keep our site in top shape and not only comply with all fire codes but ask for advice and go the extra mile to keep the threat of fire to a minimum. The crazy thing is, some of that advice we received from our fire department is now being said to be non-compliant, and we are working to resolve these things again after following through to make sure they were done right the first time. Not only do we have to deal with the *island factor* here, but good 'ol Los Angeles County can be quite the challenge as well, not to mention the State of California. We are certainly not

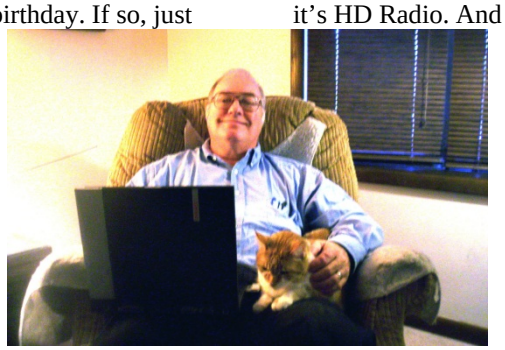
doing business in a business friendly place by any means!

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

First off, let's not forget to mention Whose Birthday we celebrate on the 25th of this month. Unless, of course, that's also your birthday. If so, just keep that one in the family. You all know what I'm talking about. So, cut the "Happy Holidays" or "Wonderful WinterFest" gorp. It's Merry Christmas – got it? And don't let anyone else get away with any of that other "PC" *stuff*, either. It's time to make a stand. We're not Sheeple anymore, folks.



Anyway..... I'm feeling blessed on a number of fronts this time out. We already know about my announcement last month, but I'm also feeling blessed about this column. It seems that whenever I begin to wonder what I'm going to write about (and we all have months like that, don't we, gang?) another something comes along to get the live juices going. And this month, it's HD Radio. And another rant about *another* phone company. Again.

Project Sheherazade

In our last issue, the question was, "What is the secret to preventing interaction between the two sets of antenna elements [in the ERI dual FM/HD antenna system]?"

That answer: The antenna elements are *inverted* with respect to each other. In other words, the two antennas are mounted 180 degrees out of phase with each other. This one move alone reduces interaction by more than 20 dB. There are a few other tricks involved in stifling interaction while allowing the

station to transmit the two modes independent, but that is the main trick.

We'll resume our question series next month. Let's take a month off for the holidays.

HD Revisited

Again? Well, why not? I actually haven't talked about that in a few months, although others have. But here in Chicago (and in Detroit and Birmingham), we have just gotten the green light to get our multicasting going again. Here, we're simulcasting WYCA, our religious outlet, on WPWX HD-2. Hmmmm, simulcasting on our multicast, eh? Nice ring to that.

This has served to energize our staff here into promoting HD again. Again? Yeah, soon as I got my staff to get the connections made, the audio right, and the new IDs for 'YCA into NexGen, the efforts turned to getting the word out, promoting it. First stop, the station web sites. My, is WPWX's web site *busy*. Wow! But, where's the stuff on HD Radio? Can't find it. Hmmm, let's check the WSRB site. Nothing. Web site is down for maintenance as I write this. Uh-oh. Over to WYCA. Decidedly, *un*busy. HD logo is there, but no link. Quick memo to staff responsible. *Get the HD Radio info back on all the sites.* Reply comes back: Got it. Now, what do we put in there? Well, WMUZ's site is really hot on the HD topic, so go there for now and see how they do it. When I check back, it's good, at least on Power 92's site. Click the logo, the link works. Great. Now let's see what's happening with the links.

Power 92's link follows WMUZ's right down the line, except that it's localized for us. Nice. I find the hdradio.com link at the bottom of the page and get on that web site. The layout at that website is superb in that, what the HD Radio customer is really looking for is right at the top of the page. A list of all the retailers handling HD Radio equipment is right there. Quite a list to pick from, too: Wal-Mart, Radio Shack, Crutchfield, Best Buy, Target, Sony Style, and Amazon.com.

Sony Style, Amazon and Crutchfield are, of course, web-based retailers. Surprisingly, so are Wal-Mart and Target, where HD radios are concerned. I find it incredible that you can't just walk into a Wal-Mart *store* and get an HD Radio. Let's start with them.

Wal-Mart carries 10 different models of HD radios, two for car, a tuner for use with analog radios which are set up to interconnect to it for HD, and seven for home use. The least expensive item on their list is the JVC KTHDPK1 Transportable HD Radio Tuner with Car Kit, which sells for $97.00. Add all of ninety-seven cents for shipping. Nice rig. I have a similar model in my car. But you still can't walk into a Wal-Mart and get one. And they don't install them, either.

Crutchfield (www.crutchfield.com) has been web-based since before HD Radio's Day One, which means that it is the only way you can get their products, unless you live near Charlottesville, VA, their home base. But honestly, Crutchfield has been the leader in HD radio sales since it first came out. The first three HD radio buys I made came from Crutchfield. I installed the first one in my car, using Crutchfield's instructions, which are so easy that even a non-geek could do the job. Crutchfield has since branched out into home radios as well, but with a few exceptions, they are pricey. And you still have to get on the web to buy them. As more brick and mortar stores get on the HD bandwagon, it *shouldn't* leave Crutchfield out in the cold, though it might. But Crutchfield still has an "in." With car stereo installation costs ranging around $100.00, going with Crutchfield is a mighty nice way to "roll your own" and save a bundle of cash.

Radio Shack is now known as "The Shack," and it's absolutely true---they're a lot more Shack than Radio anymore. And Radio Shack's lack of commitment to the HD Radio market is embarrassingly apparent, especially on their website. They don't back up their HD radios in their stores by even putting an antenna on any of them, so you often can't get even a station on them, let alone an HD signal. Their sycophantic devotion to satellite radio is going to come back to bite them in the butt, and they won't have to wait too long for that, either. Tell me when Sirius/XM has ever made money. That isn't going to last much longer, not in this President's economy.

But, I digress. About that web site embarrassment: When I checked their HD web page, on November 19, they still had listed there both the Boston Acoustic Receptor, and the Accurian Tabletop radio. Now, when you click on the "Learn More About This Product" links for either of them, you are taken to the following notice: "We have 0 [zero] matches for [product number]." Really! And *no wonder! Neither one of those products have been made in months!* What are they *thinking* down there in Foat Wuth?!?. Worse, they do have a single new HD Radio product out there, another table radio, which isn't even mentioned on their web site at all! (Okay, guys and gals, let's cut the giggling about this. This is *serious!* Who is running that outfit, anyway?)

Target Stores are new in the HD Radio

business, at least to me. Further, I was astounded to find that both books on HD Radio are available through them, the Tom Ray "HD Radio Implementation," and the David Maxson "IBOC Handbook." A bit pricey, but still a resource. I checked with a few of their stores and they stock no HD radios there. It's all on-line. And, they have only the in-house types---no car radios or portables. But the table models they have are good. I for one am interested in picking up the little $100 Sony XDR-F1HD tuner for my stereo system. That, I am told, is a nice unit.

Which is a good segue into the SonyStyle.com web site. There are only two HD Radio products made by Sony, the aforementioned XDR-S10HDiP, which is a combination HD Radio and iPod/iPhone dock at about $160, and a straight tuner for component stereo systems, the XDR-F1HD. Does anyone besides me even have a component stereo system anymore? Anyway, Target.com and Amazon.com both carry them. Wal-Mart carries the XDR-S10HDiP. Prices are the same all around except Wal-Mart's, which is inexplicably higher!

Amazon.com has a small number of automotive HD radios and most of the table-top radios/tuners that you can find at many of the other stores, both on-line and brick-and-mortar. As to portable HD, they feature the two Zune HD-Radio-equipped models. The prices are $220 and $290 for the 16 GB and 32 GB models, respectively. Amazon also features the Kenwood KDC-MP342U HD car radio, which requires the separate HD tuner box, and the JVC KD-HDR50 car radio, which does not. Prices are pretty competitive, at around $125 for the JVC and $101 for the base Kenwood (but the Kenwood HD tuner option is apparently not offered at all at Amazon!)

Which leaves us with Best Buy. Of all the purveyors of HD Radio, The Shack is the only other retailer which actually has any HD Radio presence in their stores, and Best Buy does it so much better. They have more HD car radios that you can take home than any others, and they will actually *install* them, for a price, which varies depending on the model. Depending on your locale, Best Buy might even have a couple of models of HD table radios and tuners. You'll have to check. But the big HD radio draw for Best Buy is the new Insignia NS-HD01 radio. Insignia is their "house brand." This is a little "walkman" type cutie, complete with rechargeable battery, USB charging cord (charge it off your computer's SB port) and ear buds headset. At $50 for all of that, it's a winner.

Well, almost. Its FM only (sorry, AM!) but that will be changing in the not-too-distant future. I talked with Doug Selle at Best Buy, and there's lots of news revolving around this little box. First, as I said, the dual band model is coming sometime in the future. Second, Best Buy just can't keep these things on the shelves. Their initial stockings to their stores is almost gone. They have 28,000 on back order and they're ordering (or back-ordering) more on top of that each month. Finally, Best Buy has offered to radio stations the opportunity to buy at a discount bunches of these radios (in quantities of 5-500) for use in promotions and giveaways. Many of the big name companies in broadcasting are snapping them up. We are. I've put in to order more than 25 of them for just such giveaways. What with the addition of WYCA to Power 92's HD-2, we'd be nuts not to!

In a few months the FCC will likely grant, on a case by case basis, HD Radio power increases to FM stations across the land. Two of our CBC-Chicago stations will be able to make the jump. Two will have to wait some time to do it. That increase in coverage will cement HD as a much more viable medium, and just in time. I don't see satellite radio holding out for much longer. We now have the capability to make HD truly portable, and it works. I'm listening to my Insignia radio as I'm writing this. Only one thing is left to do, and that is for the programmers to get the moxie to program niche formats to specialized audiences. There is more niche programming coming on out here in Chicago, for instance: The LDS Church is actually in operation on one station's HD-2, and radio for the East Indian community in Chicago is on the air. HD-3s are now sprouting up around the dial. I've heard Vietnamese community programming on one station's HD-3. Keep it up, guys and gals, we need some more creativity in formats in this business if we are to keep Radio healthy. We here in Engineering have done our part. Now it's your turn.

Contract Construction as a Way to Bilk the Consumer

The longer I live, the more I truly believe that lawyers see the rest of us as prey. For proof, I give you that party whose name starts with D, in Congress. Most of them are lawyers. The R Party is mostly anything but.

Well, that goes for utility companies, too. This time, I'm so ticked off I'm naming names, and only Cris can hold me back. Here goes:

Paetec is a phone service supplier that we at Crawford have used for awhile. They took over a company called McLeod a year or two ago. McLeod was a good company. We and they did great

business together, not just here, but elsewhere. However, when Paetec took over, some weird things began happening. Service began to slip. One of Crawford Broadcasting's closest business partners, which had been a happy McLeod customer for years, left within four months after Paetec took over. Why? We weren't sure back then. We have a much better idea now.

Last year, as part of a special set of broadcasts we were doing prior to the 2008 elections, we leased several phone lines from Paetec on a one-year contract. We used the lines for political season, then one of us left a notice to terminate service at the end of the contract. This was before our debacle with AT&T, chronicled in an earlier *Local Oscillator* article, so we didn't document as well. In any event, we *know* that we had ordered the lines cut off, but we didn't keep the disconnect order number. Sure enough, they didn't terminate the contract as we'd asked them to do at the termination date.

Furthermore, there's the infamous "evergreen clause" in the contract, which states that if service isn't ordered cut off *in writing* before 30 days prior to the end of the contract term, the contract is *assumed* by the phone company to be renewed for another year. Yeah, I know that AT&T does that as well, but let's get real, folks: Isn't there something to be considered blatantly dishonest about that? Isn't putting the onus on the customer, rather than reminding the customer of an approaching contract termination, simply a case of "dissing" the customer by being lazy *and* being dishonest?

Oh, but it gets worse, and this is where some new *state* laws are needed. I saw the Paetec contract. My boss Cris' signature is on it. The contract is under a page long. In it, there are two clauses which state that Paetec's Standard Terms and Conditions of Service are part of the contract, but are only extant (that is, viewable) *on-line!* The next sentence is telling..... and chilling: "Such tariffs and terms may be modified from time to time and all of which are hereby expressly incorporated for reference." Unless I miss the full meaning of this, what they're tell me is that, once a contract is signed, its terms can be modified, almost at will, by the vendor, without the knowledge and consent of the customer.

Whatever became of "a deal is a deal?" Are these folks to sit here and tell me that, even though I sign my name and submit my company to the liability entailed in that contract, that the vendor has the absolute *right* to change those conditions to something I may not have agreed to at the outset, and then get away with that in a court of law??? It occurs to me that, on a state-by-state basis, contract law needs to be modified to prohibit this sort of potential "bait and switch" practice in the writing of business contracts. Or, is it simply that I'm too legally stupid to see that this way of doing business is simply the norm, and that we all are sheep to be led to the slaughter?

Here's what you can do: If it's in office, and it's a lawyer, vote it out of office. It's the only way in which we are going to get our country back and stop the kind of white collar crime which is being encouraged here.

What does this have to do with engineering? Well, aren't engineering types assumed by station owners and managers to be able to deal with any and all situations? Just ask them. Well, from our standpoint, the more we know, the more valuable we are. (Terms and conditions only available on the Internet, *indeed!)*

Finally...

Best wishes to my best friend Len, owner of a few radio stations around the country, and his lovely bride Nancy. Recently diagnosed with breast cancer, she's just undergone surgery to get rid of the cancer and to put her completely back together again as a whole woman. Len is tickled pink that this happened before the government got its moldy meat-hooks into total control over our health care and our bodies, and he's hoping that Nancy's success story won't be among the last of its type that we'll ever see. If the present Congress and the administration has its way, though, it will be. Enough said.

Until next year, blessings, at least as good as I've had them in the last few months...

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

Thankfulness

The holiday season is upon us once again. I still can't believe another year has almost passed already. It's been a year since I was given the chance to be chief engineer here in Denver. I am very grateful for the chance I was given. It has been a definite learning experience, and still continues to be.

Firewall and Wireless Problems

The month was a fairly quiet one until about two weeks ago, when around the 15th, I found no one had wireless Internet. I did my usual troubleshooting, which included rebooting the wireless access point. Nothing changed. I ended up rebooting the firewall to see if that would fix the issue, which it sometimes does. This time, our entire Internet went down. After hours of troubleshooting with the help of Stephen Poole, he concluded that the firewall got hacked. He worked on that thing for an entire day; finally he got it so that all the wired connections could have Internet access. The wireless was a different story.

We had an older D-Link DWL-1000AP. We ended up buying another D-Link wireless router. After setting it up, a few people could still not access the wireless Internet. Sometimes, the computers would show the different wireless networks throughout the building in their list of detected networks, and other times they would not. Even when they did show the networks, they would not connect to ours. After working with D-Link for nearly three hours, they decided the unit was defective. I decided to go with the Linksys brand because D-Link customer service turned me off. The way they handled the whole situation was uncalled for. I've had better customer service with Dell, Verizon and Blackberry.

I installed the new Linksys, set it up and was able to get it working properly. My laptop, along with almost everyone else's, could gain access to the Internet wirelessly now. My dad, however, could not. Neither could Leon Owens, Jr. I have worked with Stephen and asked for help from some friends who are smart in this area and they are giving me the same ideas I've already tried. I have reset the router and reprogrammed it. I have even moved the router into my dad's office and his laptop (a brand new HP ProBook) still could not see it. The weird thing about all of this is that at home and on the road, he can connect with no problem. Also, before the old access point died, he could connect with no problem. I have tried several different channels, thinking maybe a channel is getting bogged down; no luck there. I am at a loss as to how to fix this problem. Thankfully, Dad has a hard-wired connection he can use if need be. As for Leon, I'm going to have to run a wired connection to him as well If anyone has any other ideas, I'm all ears.

Communication

We work in the communications industry, right? Sometimes I wonder if we do. I have noticed more and more lately the lack of communication within our stations here in Denver. When there are problems with equipment, I have told board ops and managers to fill out a discrepancy report and leave it in the engineering mail slot outside my office. I also have informed people that if it's an emergency and they call and I don't answer, leave a message. It seems as though my words fall on deaf ears because none of this happens much anymore.

Many other things have happened in which there has been no communication beyond a certain point. I try to communicate everything to the parties that need to know. When a station goes off the air, I will let the station manager as well as the general manager know what happened. I have noticed that board ops will wait weeks before telling me a piece of equipment is not working, and then they expect me to drop everything to fix it right away. I will admit, I do take more time fixing these problems because if they waited that long to begin with – what's another

day, right? I have also noticed that when a station goes off the air, some don't ask me if it was off the air. They take someone else's word for it, saying we weren't off the air when in fact we were.

I don't get how we can work in a communication industry and yet internally have no communication. This baffles me. "Communications is our business, not our policy!" If we all communicated properly, things would be so much easier. Equipment would be fixed much more quickly, logs could be checked to make sure things played properly, and things would get done, period. I think a good New Year's resolution for 2010 could be better communication – that we all communicate with each other properly. Make sure things get told to the needed parties. That is definitely something I'll work on.

Vacation

As I am writing this, I am slightly stressed out because this is a two-day week for me. Thanksgiving is just three days away. I leave on Wednesday for Texas until the 30th. I have so many things that I need to do to prepare for this. I need to get documents together for the people who will be caring for the stations while I am gone. I need to show certain people how to do certain things in case of an emergency. I have station logs that need to be checked. I am looking forward to my first Thanksgiving in eleven years in my home state of Texas with family. It will be a nice vacation from work and what I hope to be a great time with old friends and family.

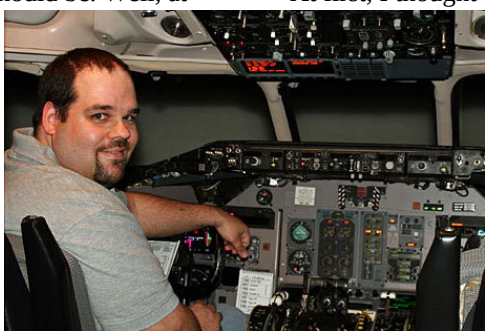
I pray everyone has (had) a great Thanksgiving and a blessed Christmas. Remember the important things to be thankful for. Most of all, be thankful to the One who sent His Son to die for us, an undeserving people. That is what we all need to be most thankful for.

Until next time, that's all folks!

Digital Diary
by
Larry Foltran
Corporate Website & Information Technology Coordinator

Google Re-invents the Wheel

After announcing their march into the operating system arena a short time ago, Google has finally unveiled their new toy and it's causing quite a stir. Set to be available to the general public by the 3rd quarter of 2010, Google seems to be shaking up our ideas of what an operating system should be. Well, at least they're trying.



Although Google Chrome OS is Linux-based, it's a significant departure from today's operating systems because it will be more reliant on the web. Based on the information available, all of the applications on the computer running Google Chrome OS will be web-based. Further, you can say goodbye to your traditional platter-equipped hard drive that you've grown to love or hate depending on the day. The system will instead be equipped with a flash memory storage option with, most likely, very little storage capacity.

Unfortunately, Google Chrome OS (GCOS from here on out) will not be available for installation on existing systems. In fact, you'll need to buy a specific, pre-loaded Google Chrome computer to use this OS. HP, Acer, and Texas Instruments are only some of the companies reportedly linking up with Google to produce Chrome OS equipped equipment. At first, I thought Google would strictly target the explosive netbook market, but reports show the contrary. GCOS may also find its way onto full size laptops, provided they are equipped with solid state drives. Quite in interesting move, in my opinion.

The first thing that came to my mind when I heard their requirement for minimal local storage is where in the world will I be storing my files? You guessed it…on the web using Google Cloud. Would you like a side of Google fries with that and perhaps a Google frappe?

I have chatted with some folks who already use Google Cloud web file storage and they seem to

love it. Call me a traditionalist in the world of computers, but I prefer to have my personal files stored right in front of me or on a local server. The nice thing about using a web-based data storage option is that they are responsible for backing up your data. Plus any sensitive data should be safe in the event your laptop or netbook is stolen. My concern is that Cloud presents a plump target and a potential Mt. Everest for hackers. I'm sure there's some fine print in the user agreement that prevents any lawsuits in the event someone breaks into the data.

Despite being miniscule, the ongoing cost for web data storage may be the other turnoff. Folks with a lot of data will be dishing out $5 every year for 20GB of storage. Not a lot at all unless you really have tons of data and could use 16TB. If that's the case, you can expect to pay somewhere in the ballpark of $4,000 every year.

So what's the benefit of moving to GCOS? The word that appears in every related report is speed. A GCOS machine will boot up in less than 8 seconds. There are a number of videos on YouTube that show these machines booting up and it really is something else. Similar to their approach to search engines, Google's OS is also very clean

Google Chrome computers should also be a bit cheaper than those OEM machines running Windows simply because this operating system will be free. Prices may be a bit steeper initially simply because of the pricier solid state storage. I'm quite confident that this will drop as time goes on and as solid state drives become more common.

I'm sure there are probably more benefits, but I see some shortcomings as well. For one, Google expects everyone to have dependable Internet access at all times during the day, which I think is extremely optimistic. If your Internet connection fails, you may be done working until you find a new connection. Even for the frequent traveler, this could pose more a problem than it's worth.

I also don't believe their approach of keeping all of the applications on the web as being very efficient. I run some pretty system intense work applications on a regular basis, and I'm curious about how well these will run via a web based delivery system. There is also the issue of multitasking. Will a user be able to send emails, upload files to a web server and still work on his article for *The Local Oscillator*… hypothetically speaking, of course.

Don't let my view of this change skew any your desire to check it out once it becomes available. There are plenty of developers and users who are extremely excited by this move, especially given the fact that it is completely open source. I do applaud Google for its efforts, but I don't believe today's computer professional, much less the average consumer, is ready for such a move. Wi-Fi seems to be available in most places, including some commercial airliners, but a dependable connection is sometimes difficult to find. This is a lesson I recently discovered while on vacation.

I honestly feel that it will take quite a bit of marketing genius for Google to convince a large chunk of the computer using population to make the move to GCOS. Although it's still early, I think Google Chrome OS will simply be a pellet gun in a battle already being fought by two tanks labeled Windows and Mac. Perhaps Google's approach will become more desirable as broadband accessibility becomes as common as drinking fountains. For now, I intend to stick with local file storage, locally run applications, and a computer that can sometimes take up to a minute to boot. It may be slow out of the gate, but everything will work as it should in the long run. Well… maybe not everything.

…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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