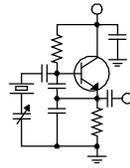


# The Local Oscillator



*The Newsletter of Crawford Broadcasting Company Corporate Engineering*

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## More Progress!

Work continues at the KBRT Oak Flat site in eastern Orange County, and at this writing we are getting really close to something approaching *done*.

Over the past month we have gotten commercial power at the site, completed the rigid transmission line work inside the building, pulled in the transmission lines to the towers, installed sample, control, power and fiber-optic lines, set the ATUs in place, installed power to the towers and much, much more.

The security/screening walls around the transmitter building, generator stall and tower bases are now complete with their stucco finish (and anti-graffiti coating), and the neutral color blends well with the surrounding area. In fact, the site has sort of an "Old Santa Fe" look to it — it's anything but an eyesore. So far there have been no complaints from recreational users of the adjacent Cleveland National Forest, which would be the only people to see the site other than workers at other ridge-top tower sites.

All our inspections have been wrapped up (yes, we passed!), and we are awaiting approval of the geotechnical report for closing of the permits and issuance of the occupancy permit. Hopefully we will have that within the next few days.

What remains is the installation of the ground radials, and that is slated to begin the first week in November. We have budgeted six weeks for

this work, but I very much hope it will take a lot less time. If we continue to have great weather, it probably will (the tower crew will be motivated to get it done and get out of there).



**The KBRT Oak Flat transmitter building enclosed by stuccoed concrete block walls. The area beside the building is a stall for a portable generator.**

We also have yet to install the microwave antenna on tower #1, and that is slated for the week of November 12. The tower crew still has to install the conduit up the tower for the power and fiber-optic feed. The installation of the Dragonwave transceiver, which mounts directly on the back of the dish, is somewhat complex, so I am working on getting a climber/engineer to the site to do that work. Hopefully by the end of that week we will have a good link to the studio.

Once the ground system and microwave link are completed, I will be ready to make the base impedance matrix measurements, produce and calibrate the models and derive the operating parameters. I have already calibrated and proofed the sample system, so once we have the operating parameters, we'll be ready to tune up the phasing and coupling system. I measured the electrical lengths of the installed transmission lines, and the design has been re-run to incorporate these minor changes. We'll have to tweak some of the networks, but I don't anticipate more than a day before we have the array adjusted (you've got to love moment-method proofs!). It will probably take more time to make the reference field strength measurements and prepare the application than the

actual tune-up.

Many thanks to Steve Minshall, who took a week and came to Southern California to supervise the installation of all the underground lines for this project last month. Without his able assistance, we would be way behind where we are right now.

This project has been all-consuming for me. I have been on the road more than at home lately, living out of a suitcase. Likewise, Bill Agresta has

been living on the mainland for the past weeks, visiting the island infrequently during the heart of the mainland construction (that's why Bill has not had a column in these pages for the past couple of months). We both very much look forward to being done with this project and having it on the air. I probably won't know what to do with myself once we reach that point.



**Cable entry to the transmitter building.**



**One of the tower bases with Austin transformer and feed tubing installed.**



**Interior transmission lines are all rigid, 3-1/8" and 1-5/8".**



**Getting commercial power to the site was an epic moment!**

### The Motown Update

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

This month I am going to talk about some of the things we have learned about ZIPONE installation at our afternoon talk show host Bob Dutko's home. In addition, I have been working on building an additional work area in our rack room so that we can have better facilities for performing equipment testing and repair.

#### Bob Dutko's Broadcast

Last month, we kicked off Bob Dutko's weekly broadcast from his home. At the time, I mentioned a high-pitched whine that was perceived at very low levels during the broadcast. After raising the average audio level with the DBX compressor, it seems that the tonal noise was not present. So we then decided to look at level settings of the system.

In order to obtain a workable level to the input of the ZIPONE, I had to turn up the microphone gain to +58dB. This control is now at maximum gain. Therefore, under certain conditions I believe we are introducing some low-level noise into the system.

After talking with Ted Alexander at Telos, the microphone preamplifier was designed with that intent. I am using an RE20, which has a lower output level when compared to an SM58, so with that microphone we are at a real disadvantage. Therefore, based on what we have found, we are going to go into a high quality microphone preamplifier first and then go into the ZIPONE with line level.

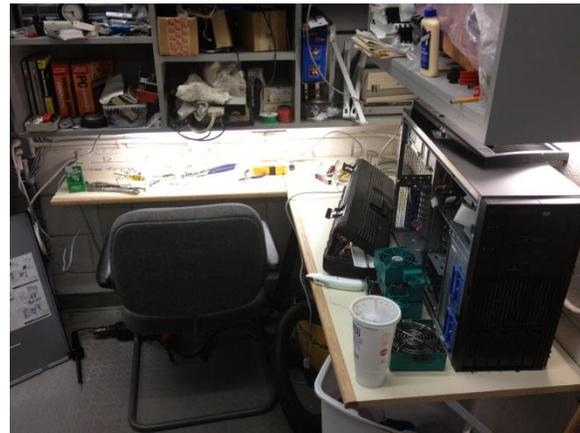
From a system signal to noise perspective this certainly will improve the audio quality. In addition, I will be able to lower the amount of compression so that the electronic noise or hiss will be eliminated. I will let you know how things work out next month.



#### Rack Room Work Area

In the interest of making our job easier and having consideration of our office neighbors, we have been working on making an additional work area for testing and repair. In the equipment rack room, we have, using existing studio furniture materials, built a small workbench. Features will be provided for testing ISDN codecs, computer servers, Zephyr codecs, and Comrex codec units.

One of the things that I wanted to achieve was to avoid using a brace where the chair and the occupant's legs would meet (ouch). So I used a ledger board and angle iron for additional bracing. I was able to get away with only using three L-bracket braces.



#### Rack room work area in progress

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

Of course, the big news as I write this (Monday the 29th of October) is Hurricane Sandy. That is one evermore *big old honkin' storm*. Growing up in NC and having been through several hurricanes myself, I naturally keep an eye on these things. In the Carolinas, you just learned to do that as part of growing up: you went to school, did your homework and watched the weather.

Sandy is humongous because of a confluence of once-in-a-century coincidences. The biggest are that there is a ridge of high pressure in the mid-Atlantic, and there is a trough of icy-cold low pressure headed directly toward it. The high pressure is blocking Sandy from heading out into the Atlantic, which is what most late-season storms want to do. Even worse, it's being pulled toward the trough and will head straight into New Jersey or Delaware. Finally, the temperature differential between the warm, moist air in Sandy and that arctic system are going to result in a serious, major storm event.

Knowing what these people will be going through not only causes me to keep them in my prayers, it brings back some memories. September 22, 1989 was a Friday; I had just finished some contract work at WLNC in Laurinburg, NC and was headed home for dinner. Hurricane Hugo was still well off shore, and yet, my little car was bounced all over the road. I was praying the whole time and I thanked God when I made it to my house, I assure you! The rest of that night was spent listening to callers with storm reports on WPTF in Raleigh, then trying to sleep with my entire house shaking from the gusts.

The center of Hugo came ashore near Charleston, SC, then curved up through the Columbia, SC area, and finally headed north into Charlotte, NC. At no time was I closer than 70 miles from the eye of that storm, but I can still remember the wind howling, the rain pounding on the roof and



my home rocking and rolling all night long. That was when I began to truly appreciate just how powerful these systems really are.

I know I've said this here before, but it bears repeating (repeatedly, too): the winds are what impress the media and they track the eye of the storm as though that's the most important spot. In fact, flooding is always the biggest killer in a tropical system and the storm's effects can be felt

many hundreds of miles from the center of circulation. The folks in New England are learning this the same way I did, and given that this storm system is much, much larger than Hugo (we're getting gusty winds here in Alabama as Sandy approaches New Jersey!), people from South Carolina to Maine are going to know that they've been through some bad weather.

I'm praying for all of my friends and coworkers at our stations up that-a-way. A special prayer is lifted for Mr. Crawford and the folks at our Corporate Offices in Blue Bell, which is going to experience strong tropical storm or even hurricane conditions for many, many hours.

#### Ventilation

WYDE-FM has been the only remaining facility here in our Alabama cluster with an unsealed building. The transmitter was vented to the outside and we had a 24" square make-up vent for intake. 10 tons of air conditioning kept the building cooled, but we were still bringing in moist and dusty outside air.

When we installed WDJC's new Thermobond building a few years ago, we ordered a sealed system: we have an emergency vent fan and intake, but normally the air conditioning takes care of removing the transmitter heat from the building. Since doing that, we have noticed a marked decrease in the number of problems with the transmitter. By contrast, WYDE-FM has had a number of failures,

including a catastrophic arc-over in the high voltage multiplier during a period of especially humid weather.

Calculations showed that 10 tons of cooling should be more than enough to allow us to seal that building and just let the transmitter blow into the room, but we needed some form of backup cooling. A 30 kW transmitter will heat a 12x30 building to beyond-oven stage in no time flat, should the air conditioning fail! To deal with that, we decided to mount a thermostatically-controlled, 24" exhaust fan on a thermostat in the existing intake vent hole. The vent holes for the main and auxiliary transmitters were then converted to simple gravity-operated exhaust vents for the system.

The fact that there were already holes in the walls of that building is what made us decide to do it ourselves. We had received quotes as high as \$2,000 from heating and air contractors; by using the existing cutouts, we were able to do it for less than half of that. If you ever have to do something like this, remember that if you sized your exhaust and intake make up air vents properly, you've already got the sizes you want. All you need is vents and a good, powerful fan.

I built a frame (see figure 1) and treated it with weatherproof stain, then mounted that over the existing intake vent hole. This is the 2nd tip, should you try to do this: it's much easier if you anchor wood to a concrete building, then attach your hood and fan to the wood. We purchased the fan, the exhaust vents and a weather hood from Grainger. The hood went onto the wood frame (figure 2); the fan was then mounted inside (figure 3).



**Figure 1 - Wooden frame, treated with weatherproof stain**



**Figure 2 - Jimmy Parker caulking the weather hood for the new vent system**



**Figure 3 - Work in progress: the fan mounted into the existing hole**

Mounting the fan, removing the old transmitter ductwork and installing the gravity-operated exhaust vents took time, but was relatively easy to do. The only snag came when I installed the Dayton thermostat. I've been buying Dayton stuff from Grainger for years; it's normally rugged, reliable and well worth it. In fact, I wasted several hours confirming that this thermostat was bad, because it was so hard to believe that Dayton would do that to me! It just didn't want to work properly; it would turn on the fan if the temperature was too high OR too low.

Once that was resolved, though, we had a sealed system and an emergency vent-and-fan backup that we could trust. I believe this will help prevent more failures like that massive burnout in the future.

### HD Woes

We have three of the FSi10 HD exciter/generators, one for each of our FMs; as I write this, only WDJC is in service. The one at WYDE-FM in Cullman failed several weeks ago, so we temporarily moved the one for WXJC-FM in Pumpkin Center into its place.

While Jimmy and I worked on the fan system at WYDE-FM, Todd was bulldogging that FSi10. Todd is indeed the original bulldog for computer problems; he just doesn't give up. He ordered a power supply; he swapped out the motherboard; he reinstalled the software. We suspect that one of the internal cards has failed, though, because nothing he did would help. We obtained an RA and shipped the unit to Broadcast Electronics in

Quincy, MA.

The very day after the first unit headed back to Quincy, the FSi10 that we had borrowed from WXJC-FM failed. Once again, we tried everything we could think of, but the unit kept timing out and rebooting. We obtained an RA and sent that one to Quincy as well. Now our only question is whether BE will be able to turn these around quickly, given that they have a hurricane up there!

Pray for the folks in New England who will doubtless be dealing with damage from Sandy for some time to come. Pray for Cris and Bill and Todd Stickler out in California, as they finish up that KBRT project. Last but not least, and until next time, pray for this nation!

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### The Chicago Chronicles

By

Art Reis, CPBE, CBNT, AMD  
Chief Engineer, CBC-Chicago

### Steve Church

A few weeks ago I approached my minister before Sunday church services and asked permission, as part of the reciting of the prayers of the people (read by the members of the congregation), to add Steve Church's name to the list of those being remembered. Rev. Kathryn asked if we knew anything about this person. I told her that every time she listened to the radio or watched TV news, and heard a voice on the air which was airing from over a telephone, any telephone, that it most likely came through a product which this man had conceived and invented. She got that immediately, and I was permitted to put Steve's name on the prayer list that week for those who had gone on to Greater Life.

Which many of us are sure that he has. Clark Novak, Marketing Manager for Telos, wrote in an email sent to me on September 28, the day after the news broke, "Steve was an inspiration to us, but I am especially glad to report that he became a brother in Christ in the weeks before his death. I and many others here look forward to seeing him again in the presence of our Lord one day. (And as usual, he'll have gotten a head start on figuring out how things work.)" Indeed.



Steve was what I can be occasionally but would like to be a lot more. Sadly, I did not know him better as a person than I did. We knew each other tangentially, of course, but more by reputation and through others close to each of us. I find it very interesting that both he and I worked for the same station in Lansing, Michigan, very early in our individual careers: WFMK. In fact, when I worked there as my first paying gig in this business, in December of 1968, it was still

known by its original call sign, WSWM. I do know that Steve was at once curious, hard-working, opportunistic, funny and, on at least one occasion, lucky. And although Steve himself never told me the story I am about to share with you, I remember it as both a great "gotcha" tale, and a great example of his style. My source for this tale is Dave Kerstin of Broadcasters General Store in Ocala, Florida, who related it to me almost 30 years ago. I won't share the names of the other players involved to protect the guilty, but after all this time I still remember this story, and their names, most vividly.

It happened back in the early 80s, not long before Telos was completely formed. In those days, Steve had one product, the Telos 10, and a very few trusted distributors for that product, mostly mom-

and-pop operations. One distributor which did not carry the Telos 10 was also, at the time, one of the biggest names in the business. Why? Steve simply wouldn't allow it. For some reason, he couldn't warm up to or even trust the place, or something. No matter how this outfit wooed him, he simply told them "No." This situation was apparently becoming an irritant to the general sales manager of said large company; he was not one to be denied what he wanted. Or, shall we say, coveted.

At the NAB show that year, Steve was showing the Telos 10 at the BGS booth, taking orders and generally being successful. The GSM at the other distributor came by and asked to carry the Telos 10. Steve again said no. After the convention, Steve boarded the plane to return to his home base of Cleveland. Settling into this seat, he was contemplating a restful flight, when suddenly he heard his name, then his company's name. Listening more intently, he recognized the voice of that GSM of that other equipment distributor, along with another voice, likely an assistant, coming from the seat directly behind him. He pulled out his notebook and began writing down what he heard.

What these two guys were discussing was a rather diabolical business plan to put Steve's company out of business. Intrigued, Steve continued to listen and write as these two blokes contemplated various scenarios on how to rid the world of Mr. Church and his entrepreneurial enterprise. I can only imagine that there must have been a bunch of scenarios bandied about, to fill the time between Vegas and Cleveland.

At last, the plane landed. Steve put his notebook away, stood up, did an exaggerated stretch and yawn, turned around and smiled down at the two conspirators, who must have looked like they'd seen a ghost. Steve said, "Well, hi, fellas! Fancy you being here. Hope you had as restful a flight as I did!" And with that, Steve Church stretched again, picked up his briefcase with his notebook in it, walked off the plane, and I'm sure had a good laugh all the way home. The looks on the faces of those two guys was all he needed to see to brighten his day. Not surprisingly, the plots to end his career, which might have hatched, never did.

Steve's career path from there makes for great history. Telos went on to thrive as it still does today. However, the company which employed the two perpetrators was itself to become history a few years later, absorbed by another Big Broadcast Equipment Supplier and Manufacturer. The GSM who had dreamed up the abortive plot saw his own career become history after the new company took

over; no one in my circle has seen or heard from him since, and I've asked. And now, Steve is a part of history, an enduring part, gone too soon of brain cancer, leaving behind a beautiful, grieving widow and an equally beautiful, grieving company which, I trust, will not become history in our lifetime, because it has Steve Church as an inspiration. Without even knowing the Telos name, more people in this world have heard Telos products in action than anything else on the air.

Think of that as having come out of the imagination of one very good man--and one with a great sense of humor.

### **Things they don't tell you in the book**

This subject may become a recurring series in future columns.

Instruction books seem to be becoming passé. There are manufacturers of equipment who don't even create instruction books anymore because the scope of the equipment is so vast and things change so much that keeping up documentation has become a considerable cost of doing business. Yes, there may often be an online knowledge base, but it is not often complete. Consider your typical super-sized automation system. They have large service boiler rooms to keep the customer service going (such as they are, in a number of cases). That creates, in my mind, a disincentive for many manufacturers to create any printed form of documentation at all, even on CD-ROM. Automation systems, such as Prophet, which we at the Crawford Radio Ranches use, are a perfect example. System problems? Just call the CSD. We pay handsomely for that sort of service with them, and we get what we pay for: great customer service, generally, but no written documentation.

This is why, from time to time, I will occasionally bring up things which are not, and likely would not, be in "the book." Here's an example. More will follow in future issues. On this one, I won't mention any names.

Consider the case of a piece of equipment which is in our transmitter audio chain. As with most equipment produced these days, it has Ethernet connectivity—great for monitor and control. The box worked great, too—as long as it wasn't connected to the Ethernet. When we connected that, and within minutes, it crashed, taking station audio off the air. The item was reset and the entire process repeated itself, not once but several times. Unplugging the RJ-45 would allow the thing to run all day. Clearly, the problem was coming in online.

We called the factory CSD. They were

incredulous. Nobody *else* was having any such problem with this software version. Heh, not for long. When other stations began to report the same issue, the factory got to the point and began to seriously work on it. But they had to have data from us victims. We said, "Yes."

Enter Wireshark. Regular readers will remember that Stephen Poole was glowing about this online data analysis program some time back. I see his point. Succinctly: We took a half-hour-long WireShark snapshot of the system, FTPed it over to the manufacturer's CSD, and within a day they had nailed it. The issue? Their product was trying to

process packets from another piece of equipment *at another transmitter site*, thus causing the crashes! The source? The WPWX Nautel NV-40 IBOC exporter, *which was just minding its own business!* Talk about the laws of unintended consequences!

As I write this, one of the members of the manufacturer's CSD, an IT guy, is here, looking things over. But everyone agrees, the problem is in *their* code. They get that! But how could we here in the field even begin to figure this one out?

I have another one to tell you about, and another one after that, but it's going to have to wait until next month or two. Until then, blessings!

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### The Portland Report

By

John White, CBRE

Chief Engineer, CBC-Portland

Today's modern digital audio world is a wonder. Analog audio signals can be converted to digital files, processed, routed, edited, and stored with just a keystroke.

Thirty years ago, a call-in talk radio program used an analog cart record/playback loop to generate a seven-second profanity delay. Airing a telephone call was via a direct tap with telephone quality host audio. Actual telephone hybrids were broadcaster dream.

In the digital world, all of those tasks are trivial. Digital hybrids become part of a telephone talk show PBX, and digital profanity delays with delays of 40 seconds are readily available. Consoles, talk show PBXes, profanity delays, editors and processors are all now small digital computers. Large scale computer networking can provide live-assist or automate programming.

Years ago, no one worried about power glitches. The major interest fell to long-term power reliability. Most stations used generators configured for auto start after 30 seconds of power loss. We simply ignored short power outages. In this, the Digital Age, that is no longer an acceptable solution.

Instantaneous power protection is now the watchword, a need generally met by UPS systems, battery backups that can be instantaneously and automatically switched on line with the loss of power

for less than a few cycles. With an auto-start generator, the UPS is only required to provide backup power of something like 30 seconds.

The number of UPS devices in a typical station today is surprisingly quite large. UPS maintenance has now become a major headache. How do we know a UPS is operational, and how do we perform maintenance without disruption the protected critical path digital systems?

The major reliability with today's UPS is the storage battery, typically a trapped electrolyte lead acid storage

battery. The life of these batteries is highly dependent on charge / discharge conditions. When I first started replacing UPS batteries I noted the date the new battery was installed on the UPS and battery.

The literature relating to trapped electrolyte lead acid storage batteries suggests a service life of 3 to 4 years, potentially as long as 5 years in some cases. My own experience suggests that 2 years is typical, in some cases less, with a very few cases of 4-year service life.

Most recent UPS equipment will be assembled to allow relative easy mechanical battery replacement. Labeling of battery age and typical service life will promote replacement on a regular schedule.

Access to an active on-line UPS is another



matter. Most battery replacement requires disconnecting power while batteries are replaced. In other words, the protected equipment must be disconnected from UPS protected power. My solution for this problem is a UPS bypass switch that transfers protected equipment to utility power during UPS maintenance.

In the last year or so I have found some commercial UPS power management switches are now available. Costing several hundred dollars I prefer to build a simple bypass device consisting of a relay, switch and some power cords and plugs. I can provide information for anyone interested.

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**Rocky Mountain Ramblings**  
**The Denver Report**  
by  
**Amanda Hopp, CBRE**  
Chief Engineer, CBC - Denver

**KLTT Issues**

The never-ending issues at KLTT keep on coming...well, the same *two* issues I should say. Near the beginning of October, KLTT lost audio, and when I looked at AutoPilot I found it not connected to the site. This is one of the symptoms that I have seen over the last few months when we have had this issue. The only way to get things back up and running is to just reset the breaker to the tower which supports the microwave antenna and related equipment for the link from the studio. This time, however, that did not work. I had no network access to the equipment on the tower at all. Even at the site.

I was able to get Derek Jackson of Today Works, LLC to climb the next morning. He found that the network cable had come loose in the radio. He was able to secure it and everything came back. Problem fixed! finally. Right? NO!

A few weeks later, I got a call that the station had lost audio again. I checked as always, and guess what? It wasn't connected to Burk. I ended up getting the station back up by resetting the power on the tower. We had to wait a couple weeks before getting Derek back to climb again. We decided to replace the PoE (Ethernet power injector) and had him check the other network cable going to the radio. We are running out of options. Only time will tell if the issue has been fixed. So far, so good!

Another issue has been occurring after switching to the night pattern, at random times, normally within the first hour after sunset. Something goes wrong and the station goes down. We have decided it is a microswitch on one of the RF contactors at one of the towers, but since I live 30



minutes from the site and the issue is so random, the chances of me catching it while being out there are slim (unless I leave the station off the air while I drive out there öörockingö the antenna system between day and night modes usually fixes it). So I decided to have Keith install a webcam at the site so when the issue happens again, I can log in and see the annunciator lights on

the antenna controller and identify which tower is having the issue. The problem is, the site knows I'm watching, so the issue has vanished for now. I am hoping the issue recurs sooner rather than later so I can fix it before the below-freezing nights get here.

**KLZ Exporter**

One day I got a call from Charlie, one of our long-time board ops for KLZ, and he asked me if I knew that KLZ's digital signal was not working. I had tuned in a couple days earlier and it was fine. So something happened. I went out and found the exporter was off. I tried turning it on and nothing. So I pulled it out of the rack and brought it to the studio to work on the issue. Nautel told me what to check for and I found the power supply was dead. They sent a replacement and that fixed the issue. I was able to put it back in the rack out at KLZ and back in digital.

**Omnia**

On one Sunday in October, I found KLTT was off the air! well, sort of. More like, there was no intelligible audio making it out on the air. After doing some troubleshooting at home, I had to make the drive out there. I found the Omnia5.EX was

unresponsive. We had a spare Omnia at KLZ, so I drove over there to get it, then installed it at KLTT. Of course, I thought I had all the settings from all the Omnias saved to my computer, but I was wrong. I ended up copying the settings from the KLZ Omnia to transfer it over to the spare. Thankfully it worked, and after a little more tweaking we were on air and sounding good. I spoke to the support people over at

Telos-Omnia and they decided to first send me out a new PCMCIA card. That didn't work, so they decided I had better ship it in for repair. Which is where it currently is. I am hoping to have it back soon so we have a spare processor.

That about covers it for this edition. So until next time! That's all folks!!!

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## Digital Diary

by

Larry Foltran

Corporate Website & Information Technology Coordinator

### Solid State Drives - Revisited

In last month's article, I described a recent computer upgrade that involved installing a Solid State Drive along with a Hard Disk Drive into a single computer. Saying that I've since then completed some related further research would be an understatement. So I thought I'd share some of the information I've come across on the topic.

As a brief recap, the hardware configuration I described in the previous article consisted of a Solid State Drive (SSD) with the OS alone installed on it (W7-64) and a 1 TB Hard Disk Drive (HDD) used for the user data and applications. This scenario worked well with a significant improvement in overall performance. But just like most things in the computer realm, there are other options that may better serve some users. In this case, I discovered two other hybrid storage options that

computer rather than a storage drive or series of drives connected via SATA cable. OCZ's RevoDrive Hybrid SE features a 1 TB HDD and 100 GB SSD



utilized for caching. Although the hardware is pretty impressive, the real magic appears to be in the bundled software which provides intelligent caching to manage the storage unit's usage. The hot data or data more frequently used is cached onto the SSD for faster access. The cold data or data less frequently used remains on

the primary storage partition as we are accustomed to. Based on my research, the BIOS will initially recognize the HDD and SSD within this unit as two separate storage drives. After the included software (Dataplex) is launched, both will be merged into a single, bootable C:\ drive.

What I found even more interesting is the apparent ease in which an existing system can be upgraded to this type of storage configuration from a traditional single HDD and without the need for reinstalling the OS and other programs. Because the data remains exclusively on the HDD until the software performs the hot data caching, the existing drive in the computer can simply be cloned onto the Revodrive's 1 TB HDD. Keep in mind that this would most likely need to be done prior to installing the Dataplex software. Once that has been completed, run the Dataplex software, remove the old HDD, and you're done.

Although OCZ makes the set-up simple and easy (based on what I saw within the documentation), this is definitely not a toy for the casual user. The RevoDrive retails for about \$400 and quite honestly has been tough to find due to limited stock on many



could be viable in a variety of scenarios.

One such option is provided by a single PCI Express expansion card to handle the storage for your

retailer sites. I must warn that a number of the user reviews I read pointed out that the integrated HDD proved less than desirable in terms of quality. In my opinion, the fact that the HDD is integrated makes this option less attractive overall. Similar to my thoughts on external storage drives, I always prefer to purchase the drive separately so I get exactly what I want.

This brings me to the next option and one that I would most certainly prefer to try. Also from OCZ, the OCZ Synapse Cache SATA III 2.5" SSD is a stand-alone SSD in either 64 GB or 128 GB capacities. Unlike the RevoDrive, this option allows you to select the HDD of your choice to work in conjunction with this SSD. Although this may not sound different at all from simply installing a SSD and a HDD as I described previously, the primary difference is in the adaptive caching feature of the accompanying software. According to OCZ, users will experience SSD level performance across the



entire capacity of the linked HDD.

The 64 GB version can be found for roughly \$75 (I did find one retailer selling it for as low as \$59) and the 128 GB version runs about \$120. If

you're the type of person who accesses a small number of applications or data on a regular basis, you may be able to suffice with the 64 GB version. If not, the 128 GB version is the one for you. One thing I must also note is that only half of the total drive space is used or available for caching. This is related to over-provisioning which is a concept specifically related to Solid State Drives. Some additional research on my part lead to an afternoon of reading about over-provisioning and something called Write Amplification related to flash memory in which the actual amount of physical information written is a multiple of the logical amount intended to be written. In this instance, I opted to not enroll in a tech class to learn about every detail related to Write Amplification and decided to leave my understanding on the topic at that.

Now for the important question: does it actually speed up the computer? Again based on user claims, some of the fastest boot-up times were reported to be in the 20-second range. Because of the Intelligent Caching functionality, all users reported a decrease in boot times and application launching during subsequent attempts. For example, one specific user reported his benchmark boot time using a HDD at 78 seconds. Once the SSD was installed, that boot time dropped to just under a minute. Subsequent boots cut that time in half with similar results while launching resource heavy applications such as Adobe Premiere, Photoshop, and World of Warcraft.

With such a relatively low price for the OCZ OCZ Synapse Cache SSD, I certainly hope to provide a first-hand account and benchmarking in the near future. Aside from my personal machines, I can see the production computers at the station and perhaps even the audio servers as perfect candidates for this option. Solid State Drives that provide us with the amount of data we've grown accustomed to are most certainly out of the price range for most of us. But for those who would like to enjoy some of the performance benefits of this type of storage, a hybrid solution could be the best option for now.

í until next month!

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The Local Oscillator  
November 2012

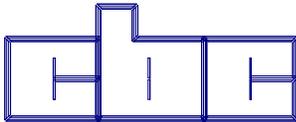
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**KBRT • Avalon - Los Angeles, CA**  
*740 kHz, 10 kW-D, DA*  
**KCBC • Manteca - San Francisco, CA**  
*770 kHz, 50 kW-D/1 kW-N, DA-1*  
**KJSL • St. Louis, MO**  
*630 kHz, 5 kW-U, DA-2*  
**KKPZ • Portland, OR**  
*1330 kHz, 5 kW-U, DA-1*  
**KLZ • 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, 3.8 kW/126m 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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