

## THE COMPUTER CORNER

### **No. 304 Time To Do Maintenance!**

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This article is a favor to you. If you follow it, you will extend the life of whatever laptop or desktop you apply it to. I reminded you to do maintenance way back in April 2007 with Cc137 on Physical Maintenance, and again in October 2019 with Cc259. Those articles still apply, for a desktop, laptop or even an Ipad. Clean your unit to the best of your ability, even if you are a beginner. You will need a vacuum cleaner with a hose (a Shop Vac is perfect, but your household vacuum will do the job, too, so long as it has a plastic “sucky” hose). Use a soft-bristle brush (a basting brush from the kitchen will do nicely, and you can replace it later or put it in the dishwasher for a cleaning). You will also need a can of compressed air. You can get one at your hardware store. The aim is to remove the dust and dust bunnies. Why? Dust prevents air circulation inside a computer. If air circulation is impeded, the temperature will go up. High temperature is the most destructive factor in electronic devices in general, including computers of all kinds.

Here are the steps to take. Unplug all the external cables and move the box or laptop to your workbench. If it is a laptop, find the vent area (the tiny grill, usually near a back corner). Put the vacuum hose up to it for a full minute and suck out what you can by moving the hose end around over the grill. Now use the air can to blow into that grill to dislodge whatever possible, and follow with another vacuum treatment. You might want to also clean up the screen – use an old t-shirt moistened with plain water. A well-worn cotton t-shirt is as good as microscope lens paper for non-scratch cleaning of soft microscope lens glass, so it will also do for a computer screen. Now clean the case as best you can, and blow the hair and dust out of the keyboard. You are done with the laptop.

If the computer is a tower or mini-tower, pop the removable cover (most often on the left side of the machine; your left as you face the front of the machine). Lay the machine flat on the covered side. Make sure your lighting is good, and examine the inside of the case. You will see a myriad of cables. Move them gently to the side as you examine each component. Identify the motherboard, the memory stick(s), the power cables that plug into the motherboard, the little twisted cables that fit on header pins for the speaker, power switch, power LED, hard drive LED, and so on. The connectors at the end of twisted cables usually have a printed label on the black plastic of the connector, and the motherboard usually has a (hard to see!) label by each set of pins that the connectors attach to. Right now! Make a sketch of the motherboard and, especially, those connectors and pins. If you inadvertently disconnect anything, that sketch will save you from grief. If you are lucky enough to have a manual for the motherboard, examine it for a nicely made road map of all these connectors.

Continue to examine. Note what is plugged in to any of the slots, and write it down or sketch it. You cannot record too much, though you certainly can write down too little! Document, document, document. Find the DVD connectors (if present) and hard drive connectors. Follow them up to the device they control. When you have a pretty good idea of what goes where, it is time to clean.

Turn on the vacuum and carefully put the hose end inside the case. Use the paintbrush to dislodge any dust bunnies, and keep the vacuum hose end close to the paintbrush to suck up the dirt you free up. Pay particular attention to the interior air slots in the power supply case, to the spaces between memory sticks, and to the fan on top of the CPU heat sink. If you have a can of compressed air, blow between the slots of that heat sink to get the dust out, but use care not to spin any fan blades too fast (you can burn out the fan motor that way because driving the fan with air will actually generate current in the fan motor). Also give a blast or two of air in the slots of the power supply. Keep the vacuum going all the while, to suck up the dirt. Now, set the machine on its bottom, and use the brush to clean up the inside bottom of the case. Suck it up, suck it up, and suck it up. Turn the case around so you can see the power supply fan blades on the back. Blow them clean from the back. This will likely blow dust into the case through the interior slots in the power supply, so go back inside and vacuum it all again. See if you can use the brush to dislodge dust from the fan blades of the power supply from the outside, keeping the vacuum hose nearby to suck the dirt up. Blow air into the corners of the inside of the case to release dust bunnies you may have missed. Suck everything up. When you are satisfied that the dirt is gone, it is time to renew contacts.

The easiest and safest way to renew the electrical contacts in a computer is to partially disconnect them, then re-seat them. This renews the contacts at the molecular level, when the metal contacts slide over each other. Start with the DVD cable. At the motherboard end, slightly raise the connector on the mating pins, then push it right back down until it is completely seated. Do the same with the hard drive connector. Now do the other ends of each cable, where the cable connects to the device. No need to completely remove the connectors. Just partially raise them, then re-seat them. This will significantly reduce the resistance of the metal-to-metal contacts. Now do the same for the power cable going to each device (one yellow, one red and two black wires, each). If you wish, you can completely remove these power connectors and then plug them back in. You cannot plug them in incorrectly, since they will only go in one way. Plus, they are interchangeable.

Now apply the same procedure for the power supply connector on the motherboard. Use care here – modern systems have a little latch on this connector that you must depress to get it loose. Plug it back in, and make sure the latch is latched (you will likely hear an audible click when it seats properly). Use care not to flex the motherboard much. Motherboards can crack, especially old ones exposed to years of baking by heat, in which case, they may well be rendered useless.

Now, move on to any video or other cards that may be present. PCI cards typically plug into those whitish slots on your motherboard, while AGP (video) cards plug into a dark-colored slot. Remove the retaining screws from any cards plugged in and raise them a bit (one at a time). Blow any dust out of the slot, then re-seat the card and replace the retaining screw. Use care not to touch any of the gold contacts on the card bottom. Oils in the fingerprints you leave will increase the resistance of the contact with its slot. Follow the same procedure for the memory stick(s). Be sure to keep fingers off those gold contacts! Do memory sticks one at a time to be sure you get them in the same slot.

Now, renew the metal-to-metal contacts at the end of those twisted wires for the speaker, power-on cable and the like. Raise them just a tiny bit, then re-seat them. If your computer could talk, you would hear it say “ooh, that feels good!”

Now, give a blast or two of air to the top surface of the hard drive, and any DVDs. Dust bunnies like to hang out up there. Next, pay some attention to the front panel. Blast out any dust or dirt there, typically lurking in slots or vents. Sometimes, there is a big vent at the bottom of the front panel. Tip the computer up on its back to get to that one.

All done? Typically your workbench will be covered with dust and debris, including some bits of paper. Hopefully there will be no paper clips or other such conductive bits of flotsam and jetsam. Vacuum this detritus up right now.

One more thing. Desktops have a coin cell battery, shiny discs about the size of a quarter. You might want to change it. Get a replacement – make it a Mallory brand because those are the best. Get one at Walgreens or your favorite electronics source, one whose battery stock is quite fresh because of lots of customers. When you have it in hand, pop the old one out and the new one in, making sure that you follow the correct + and – polarity. Be aware, though, if you change the battery you may need to reset the date, time and other data in the CMOS setup screens after the machine is up and running again. On the other hand, if your machine was not used for a long time and will not start, a replacement of the motherboard's coin cell battery may well be the answer to that problem. Now, save your notes and sketches and tape them securely inside the case bottom! Put back the side panel and mount the computer in its proper place. Plug in all the cables, but before you power up, take a moment to clean your keyboard and mouse. Q-tips are great for both. Moisten the Q-tips with Sparkle (my favorite) or Windex to clean the dirt off of keys and in between. A blast of canned air will help, too. Power up! Maintenance is done!

On the other hand, if you don't want to do maintenance, buy a new machine. Don't put the old one in the closet! Pass it on to me (along with any others that are in the closet right now) for data-destructive wiping and refurbishing for another life as an amazingly useful Linux-based machine, for use by you or other hams. More on that in the next article. Happy computing!