

THE COMPUTER CORNER

No. 216: How to Recycle a Desktop Computer and Monitor

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One hundred and sixty one Computer Corner articles ago (#55, Jun 98), I wrote on this subject, and also again in Nov 11 (#165, over 5 years ago). The process continues to be important, as computers become cheaper and easier to replace, and today many are being replaced by smart phones, iPads and the like. It is a bad thing (and illegal, too) to just put an old computer in the trash. So, here is how to approach it today, including recycling of flat screen monitors.

So you have an old desktop you want to get rid of. Start by taking off the covers by removing every screw you can find on the outside of the case. Look inside at the motherboard and find the button cell battery (about the size of a quarter), and use a small screwdriver or knife to pop it out of its holder. Wrap it with masking or clear tape – both sides – and put it into the trash (there is currently no operational recycling program for these batteries). You can put them into your hardware store's battery recycling box (there is no charge for this), but the recycling company will probably trash them. The tape will prevent accidental shorting of the battery and a potential fire. This cell kept in memory any alterations to the CMOS made when the computer was set up, including the BIOS (Basic Input Output System) settings.

Now, remove all the cables going to the hard drive, CD-ROM drive and floppy drive, if present. Put them in the trash, or if you want to save them for some future building project, neatly coil them up and wrap with a piece of tape. Disconnect every plug you can find on the motherboard – speaker, power connectors, connectors going to the front panel, and so on.

Next, remove every screw you can find inside the case. Remove those holding the video and other adapter cards, the CD-ROM, floppy and hard drives. Don't forget the screws holding the motherboard. Now pull out all those components, including the motherboard and power supply. Put the plastic front panel in your household recycling after removing all the metal components. Set the disemboweled case and covers aside. If your community has a steel recycling program, drop them off when you have a chance. I take mine to a nearby recycling company – they are more than happy to have clean steel to add to their tonnage. Actually, they will take the circuit boards, too since there is gold and other valuable metals on them. Alternatively, you might take the circuit boards to the next swapfest and put them on a table with a FREE sign attached. Or, maybe a science teacher in a nearby school could use them with a unit on electronics.

If you are handy, the power supply can be made into a fine supply for an HT, QRP rig or other small radio. Search the Internet for guides on converting PC supplies – there are a ton of them. Hint: the yellow wires are +12 VDC, regulated. Just be sure to use care, and remember that there are lethal voltages in there! If you don't want to use the power supply, open it and get the fuse (for your junk box) and fan. The fan is a 12 VDC unit and is virtually identical to the fans used to cool many modern ham rigs. If you come across a fan that works on 110 VAC (the computer is REALLY old if you do), hang it from the rafters in your basement to keep the air circulating (I have four doing just that right now). They pull very little current. If you are a builder, you might want to unsolder and save any transistors or 3-terminal regulators that you find in the power supply. And, there is some nice wire for other projects in there, too.

Disassemble the CD-ROM, floppy and hard drive, for a lesson in how these devices work. You may well need some small Torxx bits for the hard drive, but the effort is worth it. Hard drives are the most complex mass-produced electromechanical devices on the planet, and it is really interesting to see how these precision devices are assembled. Also, they have one or two extremely powerful permanent magnets in them, which are handy to use around the shop. Watch yourself, though!. Don't get a finger between one of these magnets and a piece of steel! When you have cleaned everything out of the hard drive case, put the case in with your aluminum cans ... it is a machined, solid chunk of aluminum. Check it out with a magnet. Turn it into soda cans. Oh yes, hang those shiny aluminum platters on your trees to keep the deer from eating the branches. Aren't they beautiful?

Monitors: If they are the old CRT type (the tube is made of heavy, leaded glass), don't even think about opening the case. They are dangerous, owing to the high vacuum in the tube (the front of the tube is the screen), and high voltage that can persist for many months after the unit is unplugged. You definitely cannot put these in the trash, either, since they are considered hazardous materials (the leaded glass will etch and leak lead into the water table below the landfill). Take it to a place that recycles these old beasts. It may cost you a fee. Start by calling Best Buy to see if they will take it.

On the other hand, newer flat screens can be opened and their components can be reused by you or recycled. Find and remove the screws that hold them together, and carefully pry off the halves that comprise the case. Sometimes those screws are hidden under little adhesive circles, so you may have to study the case a bit. After removing all metal from the case halves, put the halves into your household recycling bin along with other plastics. Yes, the recyclers will take them. What is left is a "sandwich" of a number of interesting pieces of plastic, and one bonded sheet of glass. You will have to remove some very small Phillips head screws to get all this apart, but again, it is worth it. For example, you will find one very thick piece of acrylic plastic that might serve you in an upcoming project. There are also some interesting thin sheets of plastic – some bone white and opaque, some transparent and some translucent showing Moiré patterns when held to the light. I suspect these are used to polarize the light generated by the screen. All these sheets and layers, including the thick acrylic one, are as large as the screen, and the thin ones can be cut with scissors for a project. Put that bonded glass sandwich in the trash, and wonder at the fact that you are throwing out several million transistors when you do it.

All done! But what have you gained? Lots of screws and wire and other stuff for your junk box, plus some goodies to be recycled and kept out of a landfill. And I hope you have taken the time to study each device you removed during disassembly. If so, you have probably learned quite a bit about how each works. The hard drives are especially amazing. While their mechanical assembly is merely akin to a very high precision phonograph record machine, the electronic control of reading and writing the magnetically recorded bits on those shiny platters is very, very complex. All that control is centered on the small circuit board on the bottom of the hard drive!

Happy Computing!