

MAINTENANCE: TEAR IT DOWN AND BUILD IT UP

Perhaps you have an old XT or AT which has been doing yeoman service for some time, and you are thinking of upgrading the modem, the video board, or another board inside the case. Why not do it right, and perform major maintenance while you are at it? It is not a hard job, and it can add years of life to a computer. Here is how to proceed.

Make sure you know the CMOS settings for your hard drive, if your computer is a 286 or above. You need to know the number of cylinders, number of heads, number of tracks, write precompensation if any, and landing zone. Write all this down.

Gather your tools: vacuum cleaner and hose, flat and Phillips head screwdrivers, nut drivers and a pad of paper for notes. The latter is just as important (or more so) than the other tools. Also locate some masking tape and a sharp marking pen to make sticky labels. Make sure everything is unplugged from the wall power socket.

Open the case and spend 10 or 15 minutes examining the inside. Use the chart below to identify each and every board inside.

BOARD IDENTIFICATION

MOTHERBOARD	Typically the largest board inside the case. Lies flat and horizontal in the bottom of a desktop case, vertical in a tower style case. All other board plug into slots soldered to it.
VIDEO CONTROLLER	Monitor plugs into it on the back of the computer.
FLOPPY CONTROLLER	Has a wide ribbon cable leading from it to the back of the floppy drive(s).
HARD DRIVE CONTROLLER	Has a wide ribbon cable leading from it to the back of the hard drive(s). There may be both a 34 wire and a 20-wire cable to each drive, or just a single 40-wire cable.
PRINTER PORT	Has a wide ribbon cable leading from it to a 25-pin female shell connector on the back of the computer.
SERIAL PORT	Has a wide ribbon cable leading from it to a 25-pin male plug, or a 9-pin plug, or both, on the back of the computer.

Note that some boards may serve several functions. For example, a monochrome video controller board typically also has a printer port. Some multifunction boards control just about everything - the floppies, one or two hard drives, one or two serial ports and a parallel (printer) port. Thus, your computer may have only two boards plugged into the motherboard. Further, if the motherboard has a built-in video controller, there may only be one board plugged into the motherboard.

Next, make a sketch of the slots on the motherboard, and number them, starting from the one closest to the power supply. Note the number of each slot containing a board, and the board type. Note on the sketch the slots that are empty. The aim is to put everything back, exactly as it was, later.

Now prepare two tape labels for EACH cable plugging into a board, including the motherboard. The label on the board can be a simple number, like "1". Also label the cable that plugs in there with a "1". Of course, no other pair of connectors (cable and pins that it plugs into) should be labeled with the same number! Be sure the labels are stuck on the same side of the cable/pin pair; if the cable has a red stripe, put the label near that edge of the cable AND that side of the

connector on the board. The purpose is to make sure the cable is not plugged back in later upside down. The red stripe on a cable should always denote pin 1 on the board.

Label the other end of each cable and the pins it connects to. The pins may be on a hard or floppy drive, or on a slot connector on the back of the computer. Label, label, label! You can't label too much, but you surely can label too little. The only things you don't need to label are the power cables that go to the hard or floppy drives. They are all the same and can readily be switched between devices, and they cannot be inserted upside down. However, you DO need to label the two power cables that plug into the motherboard (from the power supply). Note especially which pin on the motherboard takes the orange cable. Plug these in later the wrong way, and you will definitely let out the smoke!

Label all wires that plug into gold pins on the motherboard. Pay particular attention to the orientation of colored wires - make liberal sketches. Especially note the orientation of the black and red wires coming from the battery pack, if your computer has one. Many don't; instead, they have a blue NiCad battery soldered directly to the motherboard near the keyboard socket.

Unhook all the cables that will unplug at both ends and set them aside. Remove the retaining screws from each board that plugs into the motherboard, and take out the boards. Do not touch the golden fingers that plug into the motherboard. For one thing, oils on your hands can corrode them and cause intermittent connections later. Set the boards aside on a static free, non-conductive surface like a piece of wood. Now, unplug all power connectors and make sure all the wires are free and clear. Finally, unplug any other connectors from the motherboard.

Take out the four machine screws that hold the power supply in place, and remove it. Remove its cover and vacuum out any dust or dirt; use a small paintbrush to dislodge any dust from individual components. Pay special attention to the fan blades. Brush the heavy dirt off, then wash the blades with a rubbing alcohol moistened Q-tip.

Vacuum off the motherboard, using your brush to dislodge the dust. If you are willing to try it, remove the motherboard first. Remove the two screws holding it in place, and then slide it away from the power supply side of the case to disengage the plastic spacers (desktop style case). In a tower type case, you can watch the spacers disengage from the other side of the case. Thoroughly vacuum the interior of the case. Make sure any socketed chips on the motherboard are well seated in their sockets.

Now, put it all back! Start with the motherboard, then the power supply, and then plug in the available cables. Next, add the other boards and cables. Plug in the keyboard and monitor, then hold your breath and turn on the power. No smoke? You are home free. Happy computing!