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ECE 401

Section 5

9/14

## **Laboratory #1 (Pre-Lab)**






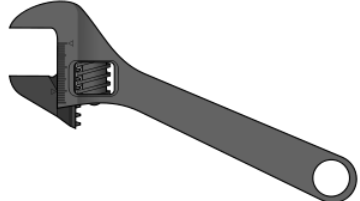
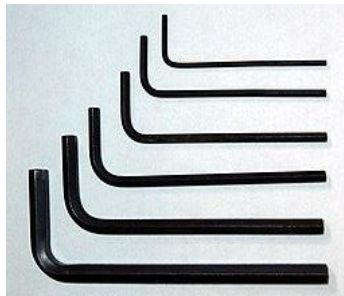



### **Objective:**

To learn to identify and use some of the tools that are typically necessary in order to assemble and disassemble electronic equipment. As well as to identify and describe the different components of a personal computer.

### **Basic Tools:** (brief desc. and proper use) + pics

- Flat head Screwdriver
  - Flat-edged shaft attached to a handle. Primarily used to screw flat head screws. Sometimes can be used for other applications
- Phillips Head Screwdriver
  - Cross-edged shaft attached to a handle. Used for screw other Philips head screws
- Needle Nose Pliers
  - Opposing long and narrow with a pointed tip attached to hinge and handle. Used to hold small objects or reach hard to reach places
- Diagonal Cutters
  - Snub-nosed scissors-like tool used to cut thick wires
- Nut Drivers
  - Socket attached to a shaft with a handle. Used to tighten/loosen low-torque bolts
- Adjustable Wrench
  - Open-ended wrench with adjustable jaw to fit many bolt sizes
- Allen Wrenches
  - L-Shaped, hexagonal steel rod used to tighten/loosen bolts and screws
- Torx Wrenches
  - Shaft attached to handle with edge of a six-pointed star. Used to tighten/loosen bolts and screws found in both automotive and computers
- Tweezers
  - 2 small, third-class levers connected at one end. Used for picking up small screws and computer components.
- Soldering Iron
  - Metal tip attached to and insulated handle with power connection. Used to join wires and electronic components using the practice of soldering

**Basic Tools (continued):**

 <p>A flat head screwdriver with a red and blue handle and a flat metal tip.</p>	 <p>A Phillips head screwdriver with a red handle and a cross-shaped metal tip.</p>	 <p>Needle nose pliers with yellow handles and long, pointed jaws.</p>
<p>Flat Head Screwdriver</p>	<p>Phillips Head Screwdriver</p>	<p>Needle Nose Pliers</p>
 <p>A pair of diagonal cutters with orange handles and sharp, angled jaws.</p>	 <p>A nut driver with a red handle and a hexagonal metal shaft.</p>	 <p>An adjustable wrench with a black handle and an adjustable head.</p>
<p>Diagonal Cutter</p>	<p>Nut Driver</p>	<p>Adjustable Wrench</p>
 <p>A set of Allen wrenches of various sizes, showing the L-shaped design.</p>	 <p>A Torx wrench with a black handle and a star-shaped metal tip.</p>	 <p>A pair of tweezers with long, thin, pointed jaws.</p>
<p>Allen Wrench</p>	<p>Torx Wrench</p>	<p>Tweezers</p>
 <p>A soldering iron with a yellow handle, a metal tip, and a power cord.</p>		
<p>Soldering Iron</p>		

## Computer Components:

- Hard Drive
  - Rectangular metal box with spinning, metal disks inside. Is used for storing computer files and applications
- CPU
  - Abbreviation of central processing unit. Small, square computer chip found under a large heatsink and fan. Handles the majority of computer's tasks
- GPU
  - Small, square computer chip. Can be found mounted to the motherboard or part of large graphics card, attached to a PCI slot. Designed to quickly process images
- DVD Drive
  - Rectangular box where CDs and DVDs enter the computer. Has a laser diode that measures wavelength of spinning CDs and DVDs
- Northbridge
  - Small, square computer chip. Like CPU. Handles all fast memory and is connected to the CPU by the front side bus. Sometimes seen with heatsink
- Southbridge
  - Similar shape to CPU and northbridge. Directly connected to northbridge and handles slower I/O devices. Rarely seen with heatsink
- RAM sticks
  - Abbreviation of Random-Access Memory. Thin and rectangular set of memory chips that allow very quick read and write times of data
- Memory Slots
  - Long and thin slots placed close together close to CPU. Holds RAM sticks
- PCI Slots
  - Long and thin slots aligned in rows on the motherboard. Used for attaching additional hardware to motherboard
- I/O Panel
  - Group of I/O connectors at the back of a computer. Connects external devices like a mouse and keyboard to the motherboard
- CPU Heatsink/Fan
  - Metal block with fins. Usually has a fan attached to the top to aid CPU cooling. A heatsink passively cools the CPU and the fan helps cool the heatsink
- CMOS Battery
  - Silver, circular battery found on a motherboard. Essential for correct BIOS bootup
- 24-Pin Power Connector
  - 2 rows of 12 pins usually located at the edge of the motherboard. Connects motherboard to power supply

**Procedure:**

1. Gather tools and computer
2. Lay computer on its side. Make sure you can take the side panel is facing up
3. Take side panel off. Disconnect any fans mounted to the side panel
4. Remove any cards present in the PCI slots
5. Remove any memory sticks in the memory slots
6. Unscrew and remove fan and/or heatsink on CPU
7. Disconnect all wires attached to the motherboard
8. Unscrew all screws holding the motherboard against the case
9. Carefully lift out the motherboard from case. Avoid catching any wires on the board as remove the motherboard
10. Remove hard drive from case
11. Separate CPU from motherboard

**Expected Results:**

There will be no calculations over the course of this lab

**Questions:**

- Does this computer have any cards in the PCI slots?
- How many RAM sticks does the computer have?