

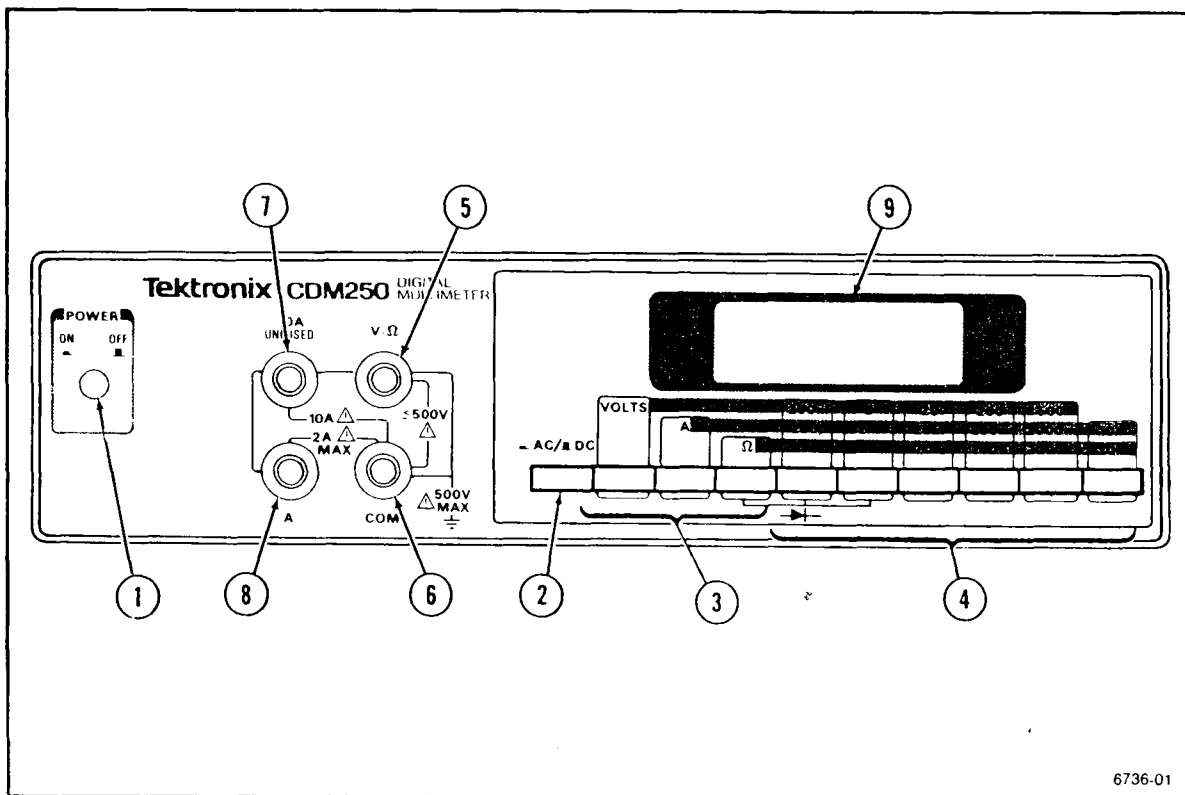
# ECET 107

## Lab #1

### Test Equipment

#### Digital Multimeter

The CDM 250 Multimeter front panel is shown below. You should become very familiar with this instrument as it is used in virtually every lab you will be doing.



The controls on the front panel are as follows:

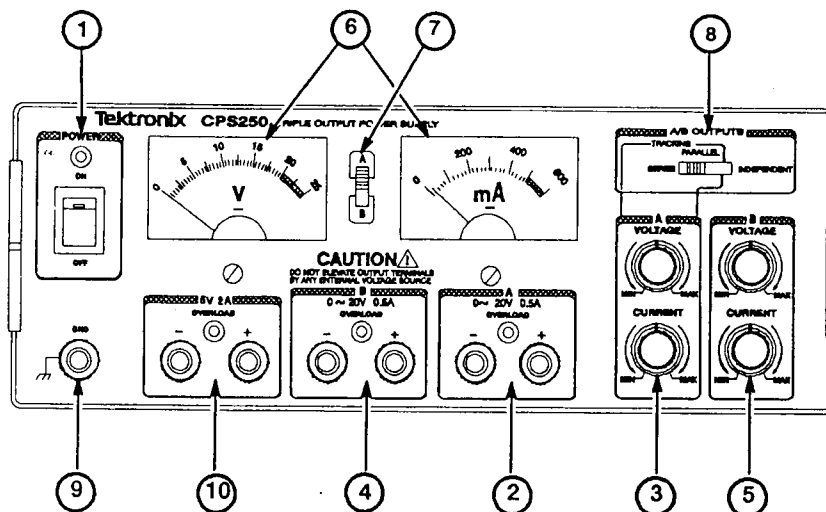
- #1 Power switch which turns the power ON and OFF. There is an LED indication above the switch to indicate ON.
- #2 AC/DC switch measures both alternating current (AC) and direct current (DC) values. For ECET 107 you will only be measuring DC

- #3 Function buttons—these are used to select Voltage (Volts), Current (Amperes), or Resistance (Ohms,  $\Omega$ ).
- #4 Range Button—Push to select the highest value of the Voltage, Current, or resistance to be measures.
- #5 V- $\Omega$ -Input connector for the positive (red) test lead for volts and Ohms.
- #6 Common Jack—the input connector for common (Black) test lead. Used for Voltage, Current and Ohms.
- #7 10A Unfused jack—Input connector for positive (red) lead for measuring current over 2A and less than 10A.
- #8 2A Jack—Input connector for positive (red) lead when the instrument is used to measure up to 2A of current.
- #9 LED Display—Indicates voltage, current or resistance value. Negative values are indicated automatically.

### **Power Supply**

The CPS 250 Power Supply front panel is shown below.

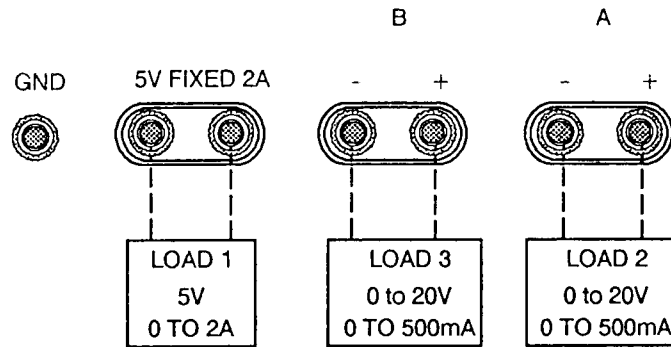
Explanations of each control or indication is explained also:



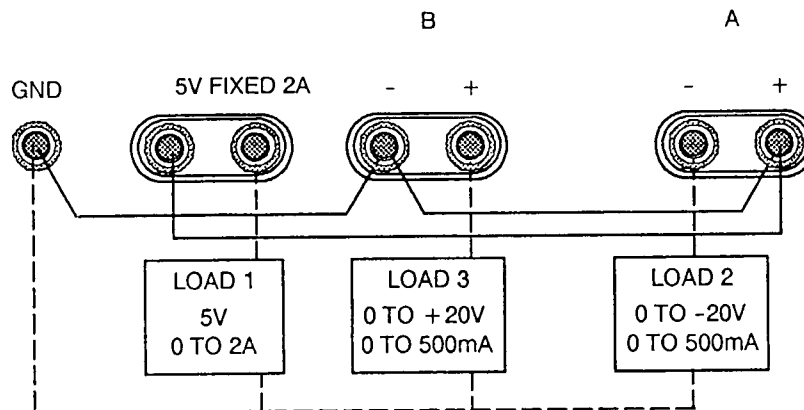
- #1 Power switch—Indicates if the power supply is ON or OFF. There is an LED illuminated when the supply is ON.
- #2 Output Terminals for the A Power Supply—Red lead is positive (+) and Black Lead is negative (-).
- #3 Control knobs for the A Power Supply—The top knob is to adjust the output voltage, the bottom knob is to adjust the output current. This is something that should be checked if you are unable to set the voltage high enough for your requirements.
- #4 Output Terminals for the B Power Supply—Once again, the Red Lead is positive (+) and the Black Lead is negative (-).
- #5 Control knobs for the B Power supply—The top knob is to adjust the output voltage and the bottom knob allows you to control the output current. Be sure to check the current knob before you attempt to run experiments.
- #6 Meters—The meter on the left indicates voltage and is labeled (v). This is the voltage for the selected voltage. The meter on the right indicates current and is labeled (mA). This is the current drawn from the selected voltage.
- #7 Selection Switch—This switch selects which power supply you have chosen. The meters will indicate voltage and current for the chosen supply.
- #8 A/B Outputs—There is a series and a parallel mode on this switch. In SERIES mode, the A power supply controls the voltage for both power supplies which ranges from 0-40 volts. In PARALLEL mode, the A power supply controls both the voltage and current for both power supplies. The current can range from 0-1A.
- #9 Ground reference terminal—This is a reference terminal that finds much usage when connecting (+) and (-) voltages from the power supply.
- #10 Output terminals for the fixed 5V supply—This is a power supply that can not be varied. It supplies a constant 5 Volts.

# Power Supply Connections

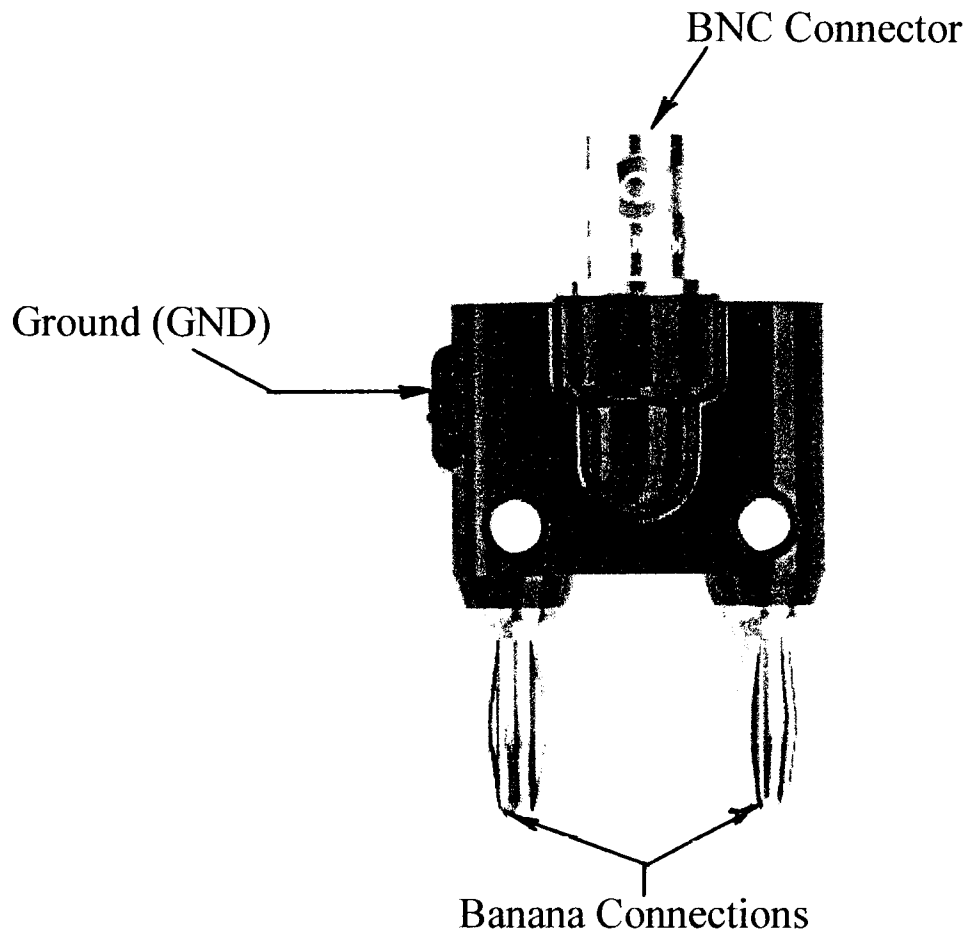
The independent supply connections are shown below. The “A” and “B” supplies are variable and the “Fixed” supply is a constant 5 Volts at 2 Amperes.



Connections for BOTH positive and negative supplies are shown below. Once again, the “A” and “B” supplies are variable and the “Fixed” supply is a constant 5V. All of these supplies can be either positive or negative supplies.



# BNC to Banana Adapter



**(Be sure to connect the GND connection to the Black, or ground, on the equipment!!)**

## **Measurements:**

1. Using the Multimeter, measure and record the voltage on a typical 9V battery.
2. Using the Multimeter, measure and record (2) AA Batteries placed in series with one another.
3. Using the Multimeter, measure and record (2) AA Batteries placed in parallel with one another.

4. Using the Multimeter, measure and record the voltage at the output of the 5V fixed supply.
5. Using the Multimeter, measure and record the voltages at the output of the variable supplies. Set the power supplies to +7V, +12V, +15V, -7V, -12V, and -15V
6. Set up the power supply for  $\pm 12\text{V}$ . Measure the voltages with the Multimeter and record them in the data section.

**When using a power supply, be sure that the current control is turned to its proper value to allow the supply to provide adequate current. If you exceed the set current limit, the voltage will decrease when attached to your circuit.**