

# Lab Intro / Soldering

LCC 4730 / LCC 6318 / LCC 8803  
Spring 2007

## Variable Power Supply

Output connections in Volts DC  
(direct current)

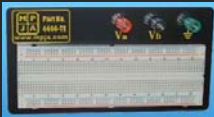


Red: power  
Black: ground

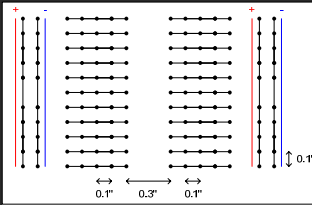
Specifications:

- 1.5 to 30V DC output
- 0 to 1A output current
- 100 to 240V AC input
- Over-voltage/current protection
- Short circuit protection

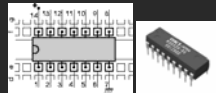
## Solderless Breadboards



Solderless breadboard with binding posts for power and ground connections



Breadboard diagram with power and ground tracks, sizing standard for DIP (dual inline package) chips



## Multimeter Usage



Mastech MY68  
Autoranging

Connections:

- Black - COM / Ground
- Red - 10A, 300mA, V/Ohms

Continuity Test, Diode Test, Resistance, Voltage, Current

Specs:

- DC voltage range: 326mV - 1000V
- AC voltage range: 3.26V - 750V
- DC/AC current range: 326µA - 10A
- Resistance range: 326ohm - 32.6Mohm

## Multimeter Usage

Continuity Test



To check if two points are electrically connected, audible beep sounds if they are

Diode Test

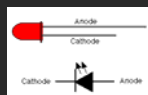


Diodes only allow current to flow in one direction only, they have a positive (+) lead (i.e. anode) and a negative (-) lead (i.e. cathode)

LEDs are diodes that emit light

You can test the polarity of a diode using a multimeter set to "diode test" mode

Connect the black lead to (-) and the red lead to (+) and the diode will conduct. Connected backwards it will not.



## Multimeter Usage

Note: in manual range mode, always make sure to select the correct range before connecting the multimeter leads!!

Resistance measurement (in Ohms)



To check the resistance of a component, like a resistor Component should not be in circuit (this will result in false readings and possibly break the multimeter)

Voltage measurement



To test the voltage at a point in the circuit (i.e. voltage difference from ground), connect the black lead to ground (0V)



DC

AC

E.g. Test the power supply voltage

## Multimeter Usage

### Current measurement



DC



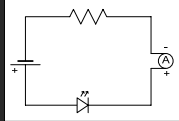
AC

Use the 10A jack until you're sure that the current is less than 300mA, and set the range before connecting the leads!

Current is measured in series with the circuit:

- Turn off the power
- Break the circuit
- Put the meter in series
- Turn the power on

Example circuit:



## Soldering

### Soldering Tips:

#### Begin by tinning the tip of the iron

When it's hot, wipe the tip on the sponge and melt some solder onto it so that it is smoothly coated

#### Use a helping-hands to hold all parts

#### Heat the joint, not the solder!

Heat travels through the components to melt the solder, ensures a strong joint

#### Clean the tip frequently on the sponge

#### Turn off the soldering iron when you're done!!

### Soldering Exercise:

1. Solder red and black wire pieces to a header receptacle for use with your wiring board
2. Solder colored wire pieces to another header receptacle for data connections on the wiring board