Lab 7 Troubleshooting Ideas for the Buffer PCB

Purposes of the PCB and soldering:

* Make good intended electrical connections between the mother board and the components on the buffer PCB.
* The PCB provides mechanical structure to hold the components in place, traces to rout the electrical connections, pads to solder to, and a solder mask to help prevent solder from flowing where it should not go.
* The solder makes robust electrical connections between the pads on the PCB and the components.

Problems that can arise:

* The traces on the PCB rout electrical connections to the wrong places.
* The components are placed in the wrong orientation (applies to the op amp IC) or in the wrong spot (applies to the resistors).
* Problems with soldered connection:
  + Does not make the connection (open)
  + Makes an intermittent connection (typically from a cold soldered joint – the pins were not hot enough, solder was melted on the iron rather than on the pin and pads, and/or flux was not used.)
  + Make unintended connections (shorts from solder bridges)

# Procedures to following if the buffer PCB is not working:

With components soldered on the PCB and the buffer PCB is placed on the bench (i.e., it is not inserted in the motherboard)

**Check Op Amp orientation:**

Is the beveled side of the op amp on the same side as R1 and R2? If it is in backward and you have applied power to the board, the Op Amp is ruined and needs to be replaced.

**Check Continuity using a DMM:**

This will find opens in the nets. When probing a pin on the LF347 for continuity, also, prob adjacent pins to make sure there is not a solder bridge to either one (i.e., a short).

For header pins, touch the pin on the bottom side of the PCB (don't touch the solder or the pad)

For LF347 pins, touch the top of the pin (not the solder or pad)

* Between Header GND Pin and LF347 Pin 3
* Between Header GND Pin and LF347 Pin 12
* Between Header V+ Pin and LF347 Pin 4
* Between Header V- Pin and LF347 Pin 11
* Between Header Lout Pin and LF347 Pin 1
* Between Header Rout Pin and LF347 Pin 14
* Between LF347 Pin 2 and one side of R1
* Between LF347 Pin 2 and one side of R2
* Between LF347 Pin 13 and one side of R3
* Between LF347 Pin 13 and one side of R4

**Check Resistance using a DMM:**

* Between Header Lin and Header Lout should be
* Between Header Rin and Rout should be
* Between Header Lin and LF347 Pin 2 should be
* Between Header Lout and LF347 Pin 2 should be
* Between Header Rin and LF347 Pin 13 should be
* Between Header Rout and LF347 Pin 13 should be

Set up the function generator and Oscilloscope using a known good Buffer PCB. You can borrow one from the Lab Assistant. This ensures that you have the connections correct.

Do not "hot swap" your PCB into the motherboard. That is, make sure the power to the motherboard is turned off and the charge on the capacitors drained off. The power LEDs will be off when the capacitors are drained.









