16 Step Analog Sequencer
Assembly Instructions
& "Cheat Sheets"

Original: 12/1/10

When you first un-box your kit you will find a printed circuit board (ECB) and a bag of components. While we take care to ensure your kit is shipped to you properly packaged some damage can occur so please start by checking the ECB for damage.


Once you have checked the ECB it is time to unpack the components, carefully. Sort out the resistors (there is a cheat sheet in the back for this), capacitors (there are only three values of cap and each are a different size) and separate the LEDs. Most of the other components are individually packed or packed as groups so they are easily separated.


Now that you have the components separated you can begin assembling your 16 Step Sequencer. For ease of assembly I recommend using a tape such as scotch tape, masking tape, blue painters tape or any other tape that will stick well but will come off the board easily (duct tape is right out). The tape is used to hold the components in place on the board so you can flip the board over for soldering. Order of assembly is somewhat important and it is best to start with the resistors and Schotkey diodes. By starting with the smallest components first you aren't trying to get your soldering iron into a tight spot between components.

In the assembly shots that follow I started with the resistors since they come loosely packaged and since they were sorted once I didn't want to have to deal with them again. There is an additional cheat sheet on the next page that graphically shows the locations for all of the resistors, by value, and for the schotkey diodes.
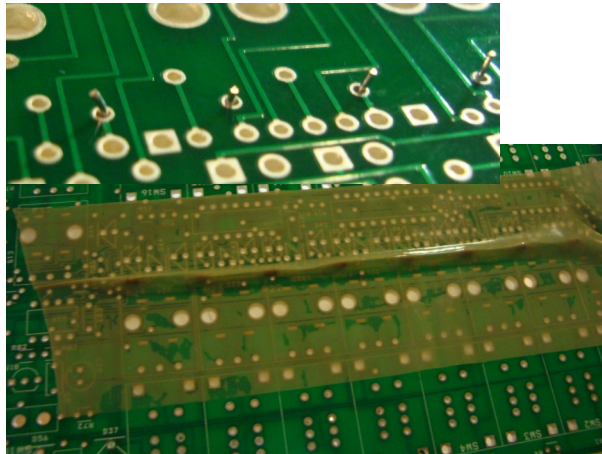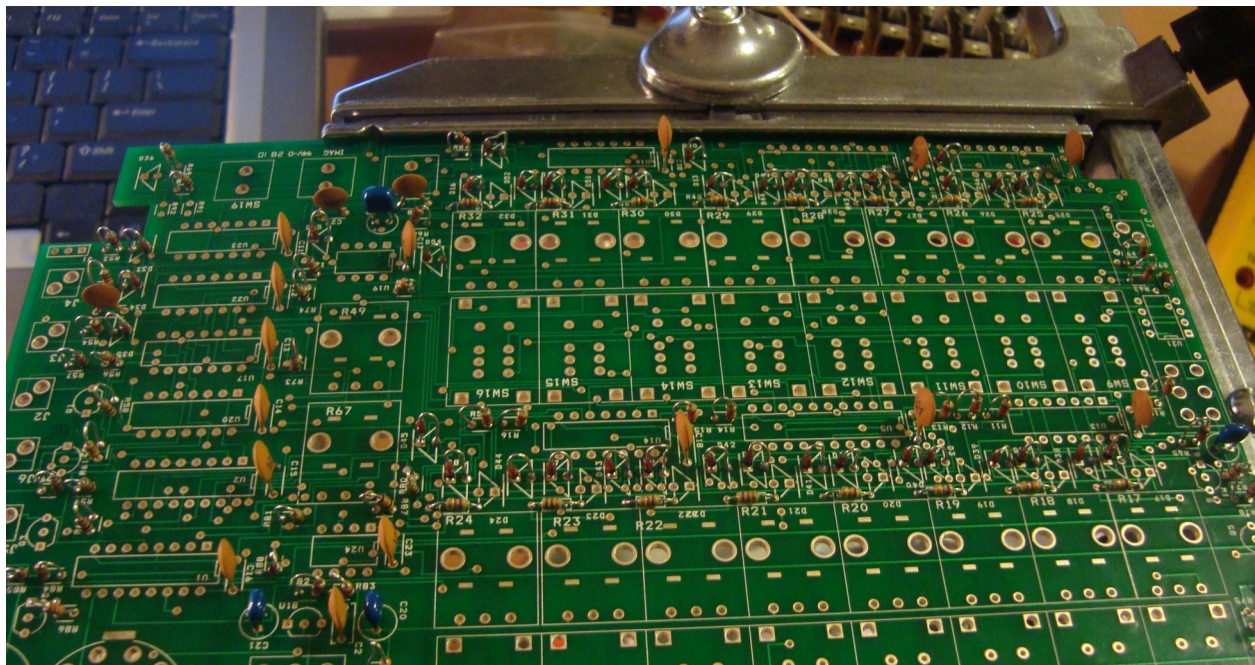
Lead clinching and taping
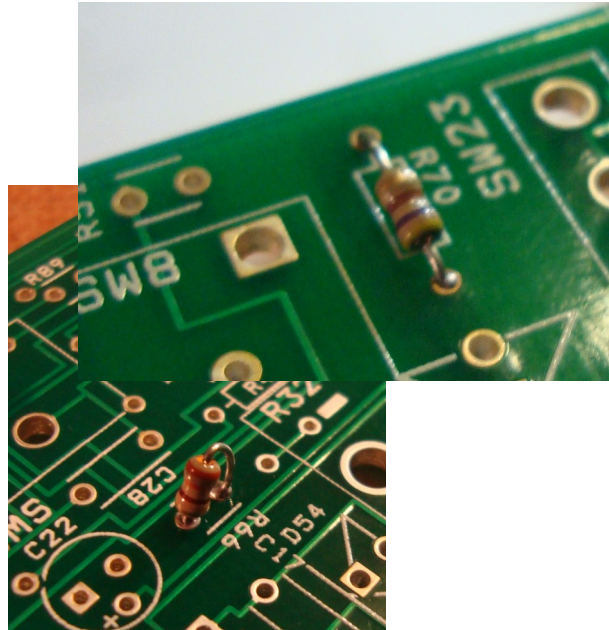
Resistor mounting styles.

Once the fixed value resistors and diodes are installed it is time to move on to the capacitors. There are three values of capacitors and, conveniently they are three different sizes so sorting and installing them is quite easy. For installation see the cheat sheet on page 5.
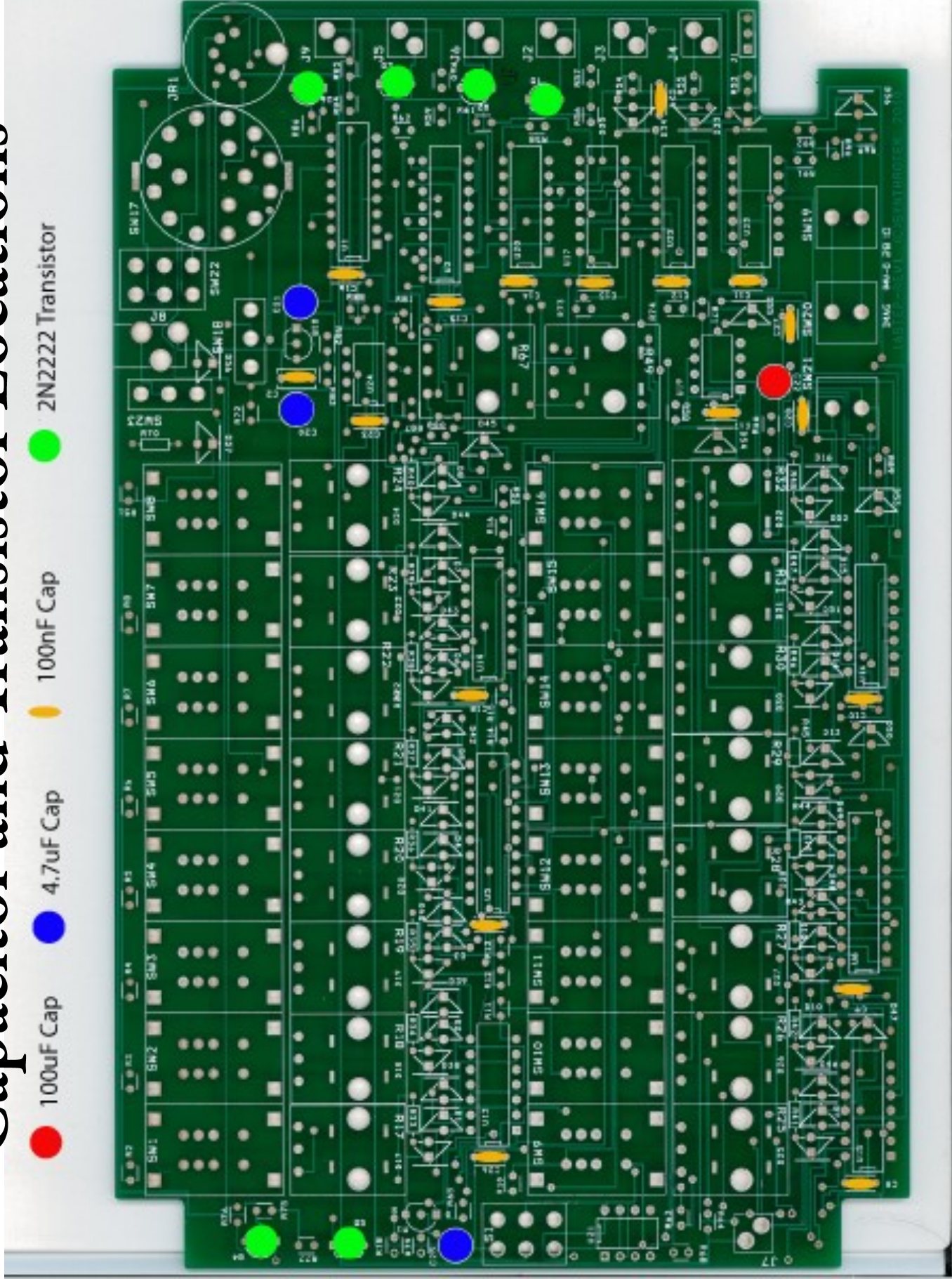
Resistor and Diode Locations

Legend:
- 100 Ohm
- 470 Ohm
- 1Meg Ohm
- 10K Ohm
- Schotkey Diodes
- 330 Ohm
- 1K Ohm
- 22K Ohm
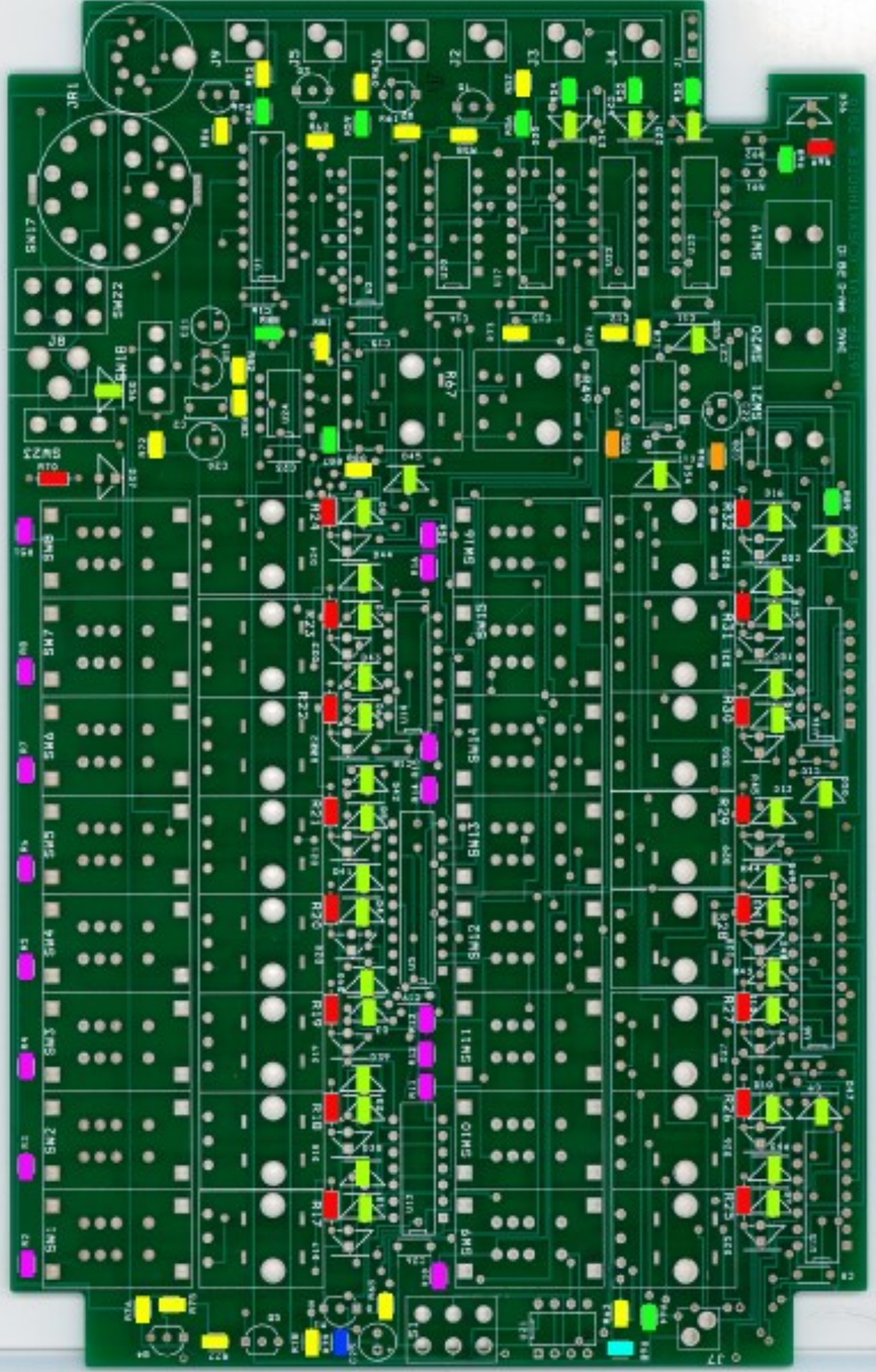
Capacitor and Transistor Locations

- 🟢 2N2222 Transistor
- 🟡 100nF Cap
- 🔵 4.7uF Cap
- 🔴 100uF Cap

Once the capacitors are soldered in move on to the IC's. An important installation trick with ICs is to use a flat surface, like a desk, to roll the leads straight enough to properly insert them through the board.

When installing the ICs a good trick is to lightly tack two corner pins to hold the chip in place while the rest of the pins are soldered. Once the remainder of the pins are soldered then go back and finish up the pins that you tacked to begin with.

A location map with the IC types is shown on page 7.
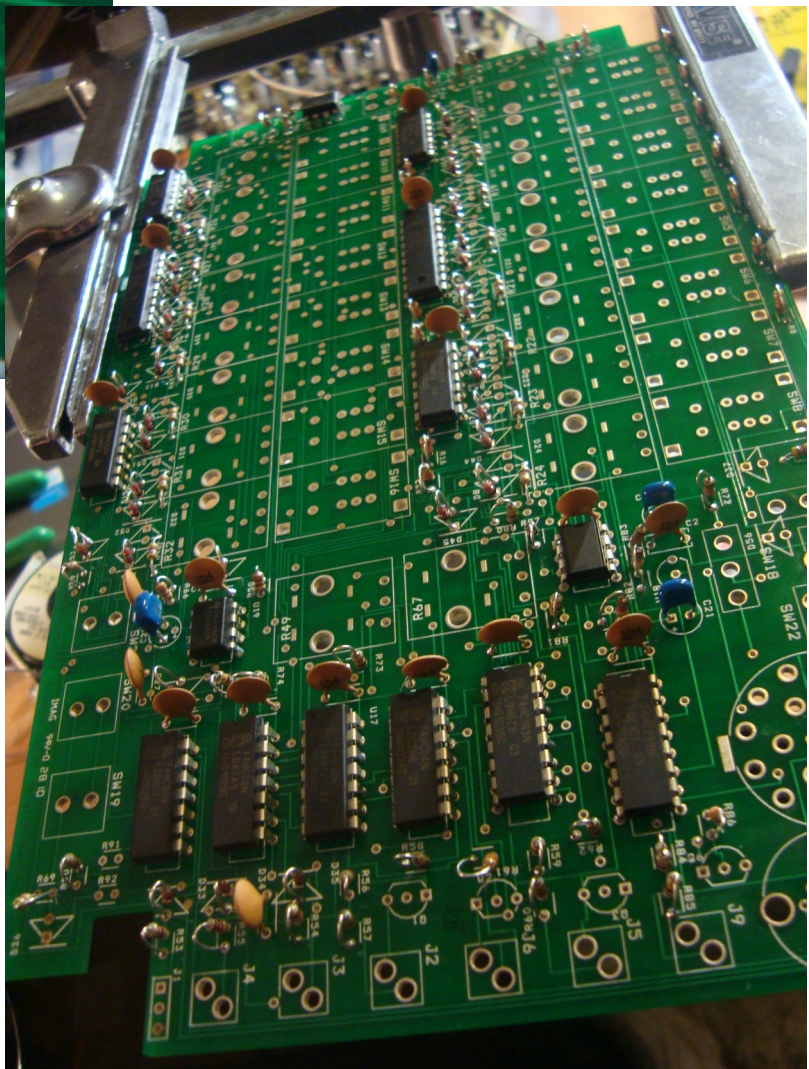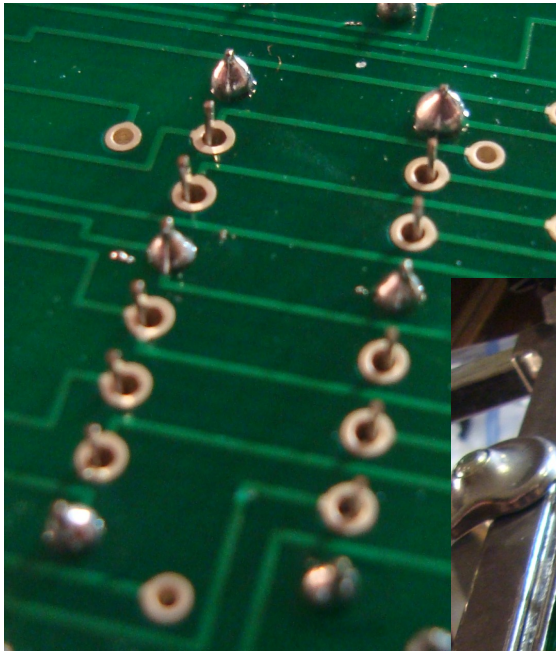
Integrated Circuit Locations
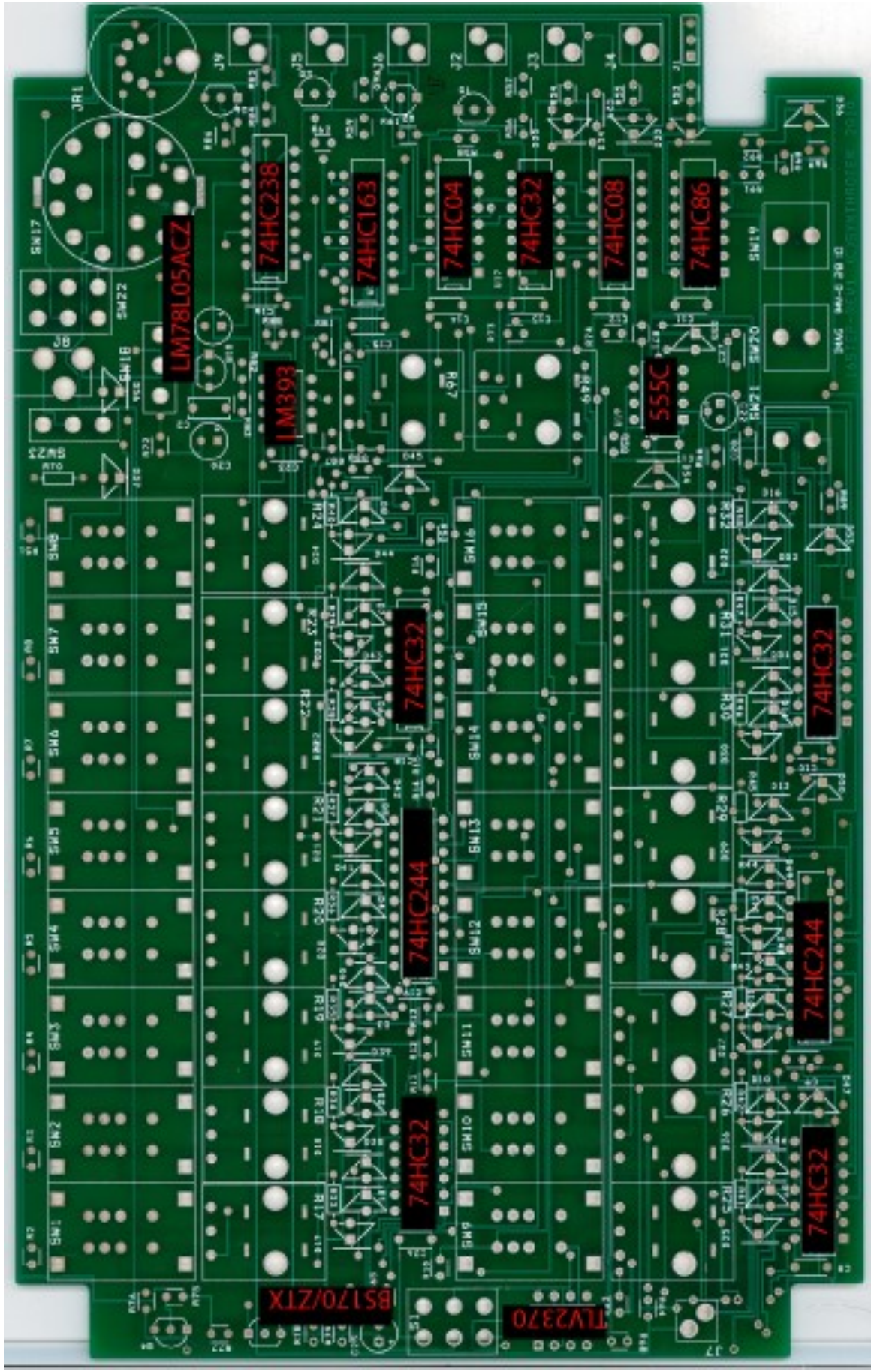
Once the ICs are soldered into place move on to the 10K potentiometers and the channel switches. This may seem counter intuitive since normally you would want to solder the remaining smaller components first. However since this board is designed to mount up to the back of the case top the transistors and voltage regulators need to be installed such that they will not interfere with the case. The LEDs will also need to be installed after the switches and potentiometers so that they will also line up with the case once the board is installed.
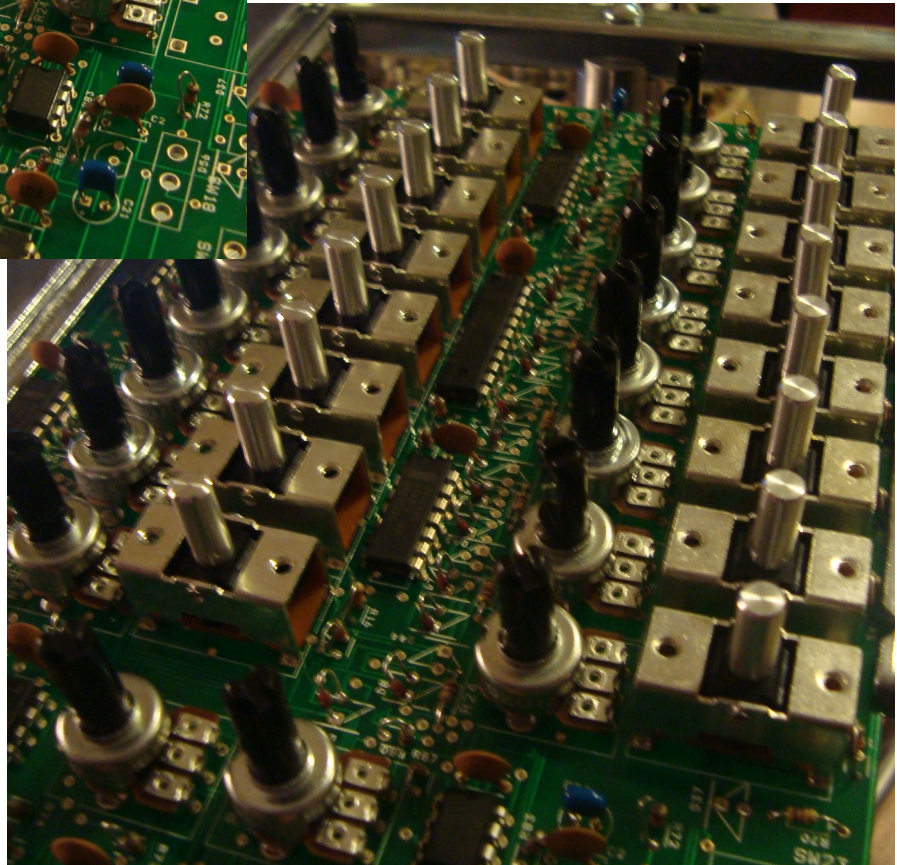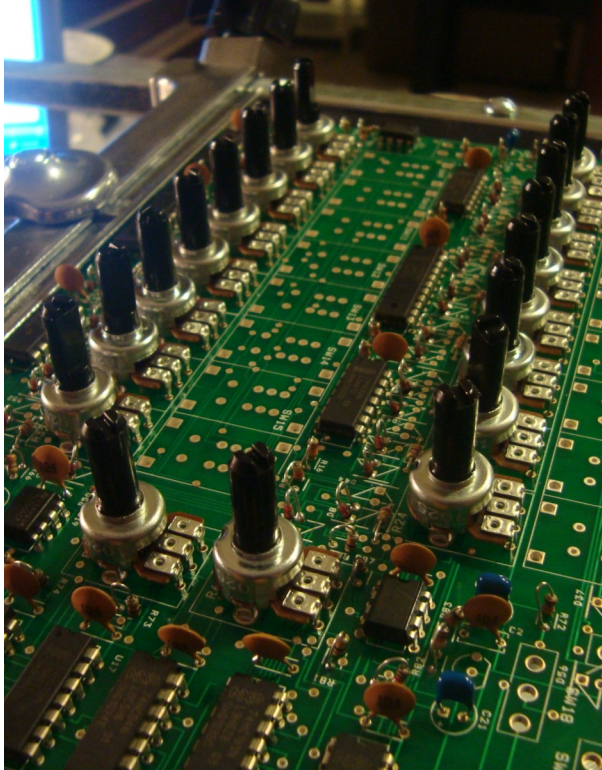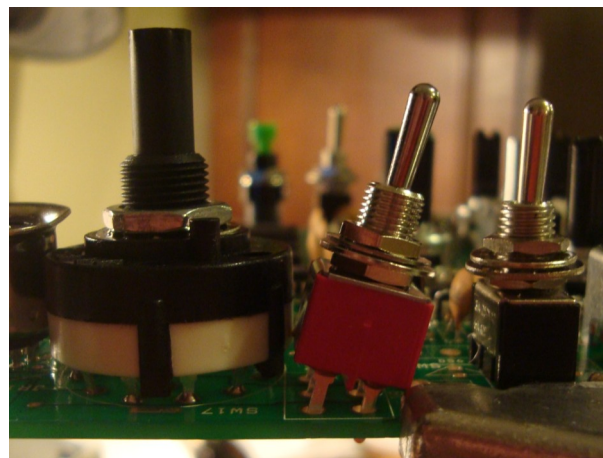
Now that the channel switches and potentiometers are mounted you can install the transistors, LED's and voltage regulator (U18)
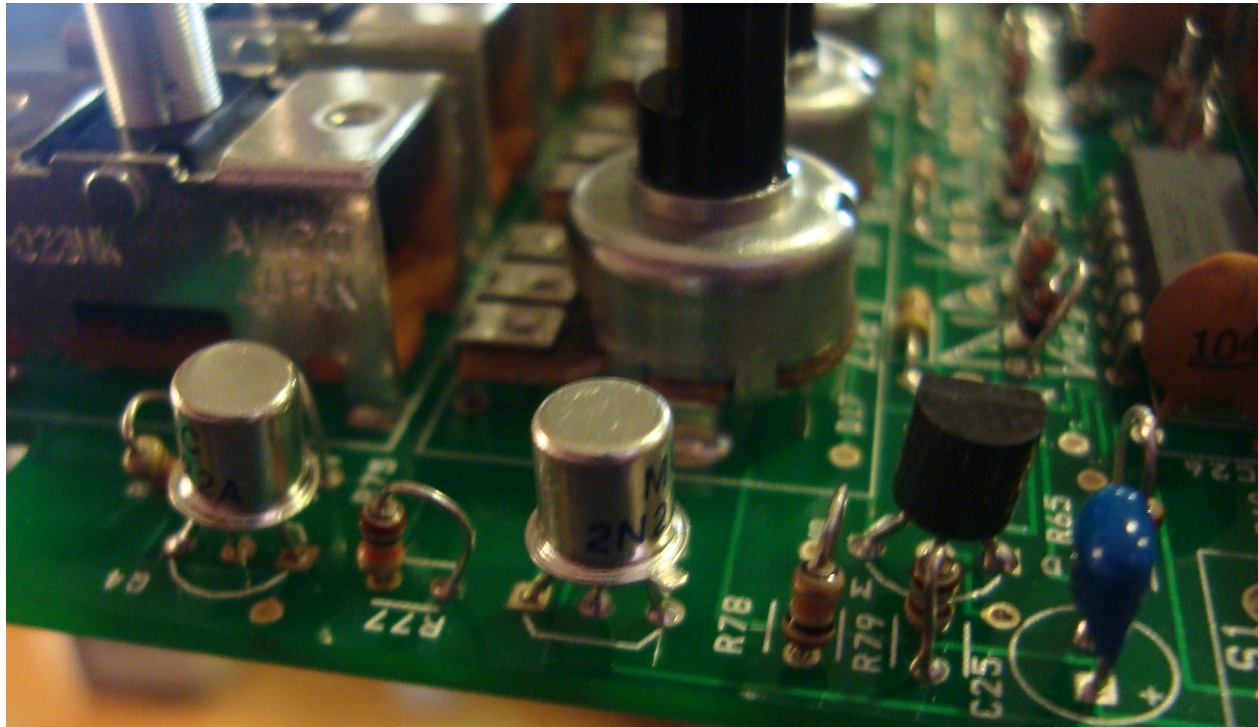
In the case of the transistors shown in the photo above the package style ordered is for a TO-5/TO-18 while the artwork is for a TO-92 (TO-226) It is critical that you install the transistors properly, otherwise the board could be rendered inoperable.
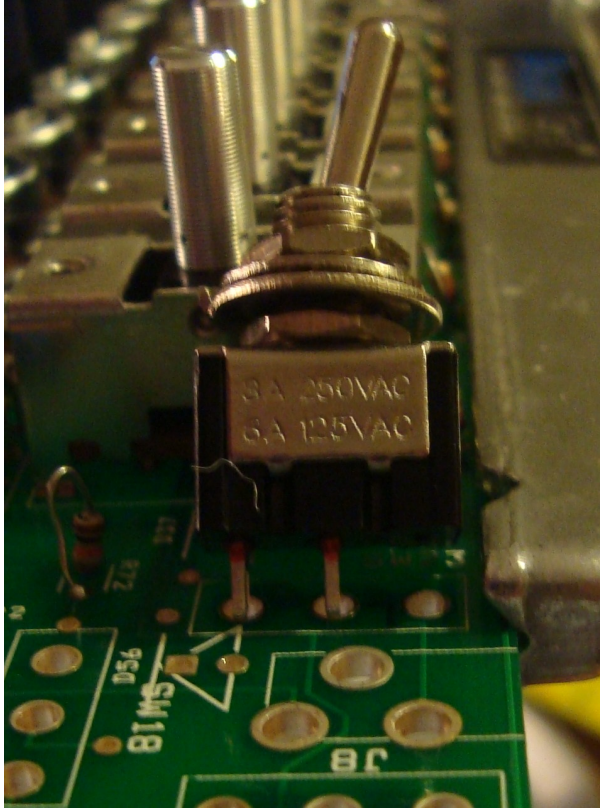
The next components to be covered are the switches. There are a total of eight switches on the board. One rotary, one SPDT, two pushbuttons, two SPST, and two DPDT. Due to space constraints one of the DPDT switches is installed using lead wire.

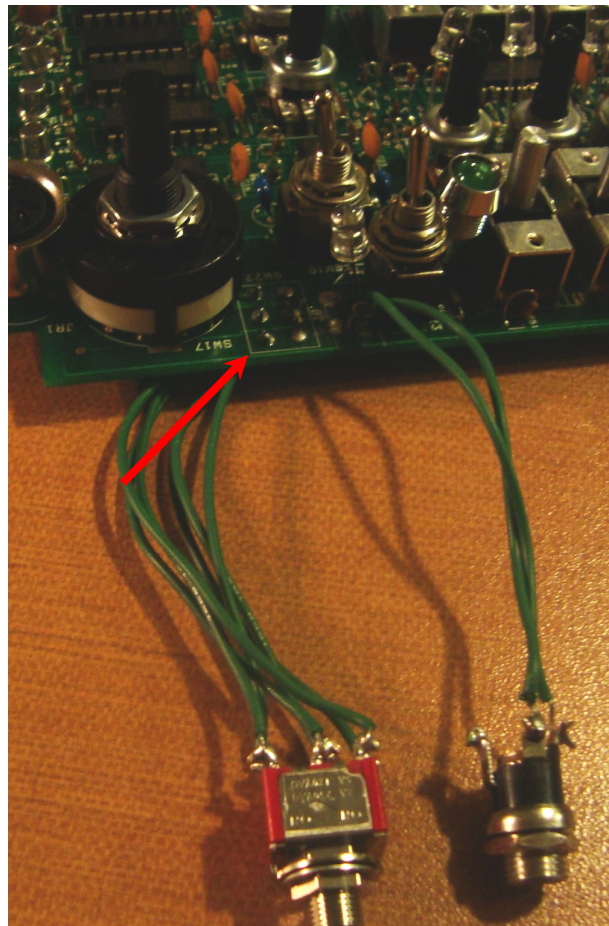Rotary switch and I/O switch

Hold and step switches

On the previous page we showed the step and hold switches. The hold switch is the toggle switch installed in the middle. It is important to install this switch in a way that prevents contact with the other components.

The next switch to be installed is the power switch (shown to the left). The board is designed to accept a switch with three pins although only two are used. The photo shows the correct orientation for the switch for proper operation.

Power Switch

For these instructions the I/O switch is installed using lead wire due to limited space. It is also installed below the board based on the case layout we are using. Your mounting may vary depending on your case layout and/or design.
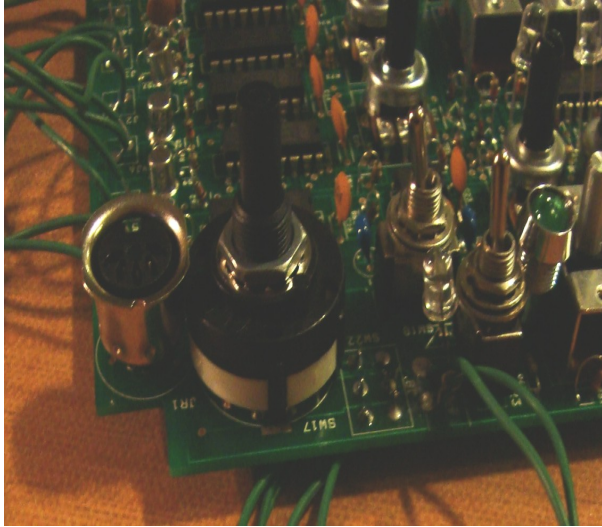
You are now ready to solder on the power jack. When soldering lead wires onto the switch and the power jack it is easiest if you bend the pins into hooks and tin the ends of the wire and form hooks at the end of the wire too.

This will give you a stronger bond than simply soldering them as straight connections as well as providing a means of holding the wire in place while you are working.

The final switch is the rotary switch. It is important to note the orientation of the switch as it does not "wrap around" and it can be installed incorrectly resulting in improper, or no, operation of the sequencer.

Next we install the 5 Pin DIN connector, located next to the rotary switch.

It is important to note the connections to the power jack. At Synthrotek we assemble our power connectors for a "center ground" connection. Your wiring will depend on the power supply you choose to use.


Center

Sleeve

You are now ready to move on to the panel jacks, there are eight. Seven of the jacks are wired for Tip-Sleeve and one (J1) is wired for Tip-Ring-Sleeve. It is easiest to prepare all the jacks ahead of time (see photo below) and then solder them to the board.
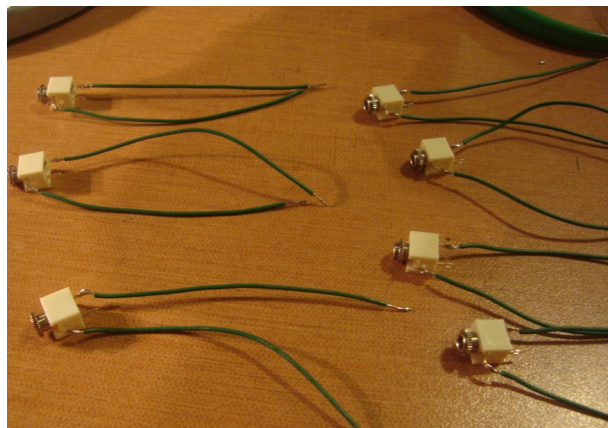
The connections on the jacks are shown to the right. When soldering leads to the jacks it is a good idea to pre-tin the wiring and then form hooks (shown below) which can be attached to the jack. This provides a better mechanical bond.
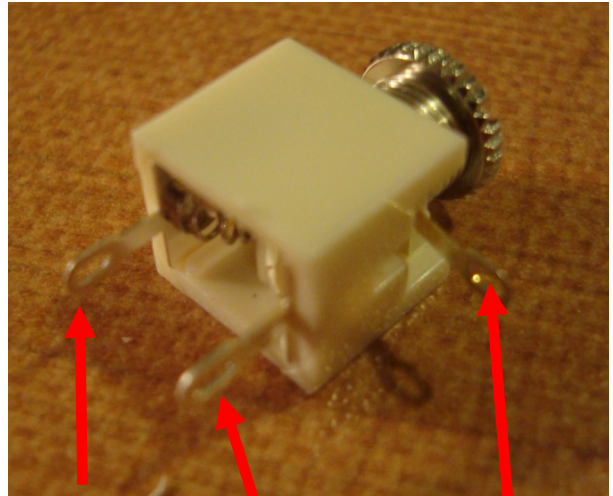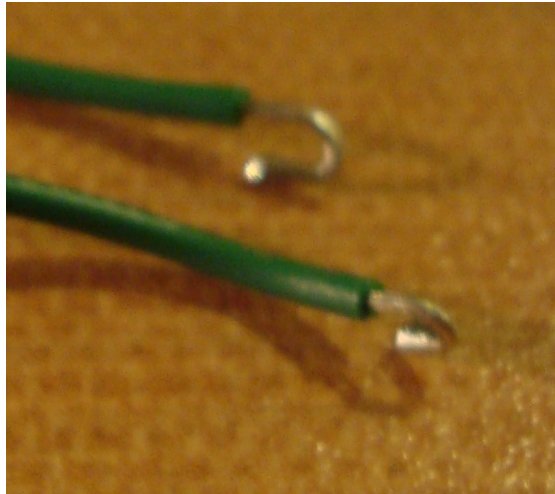
Tip

Ring

Sleeve
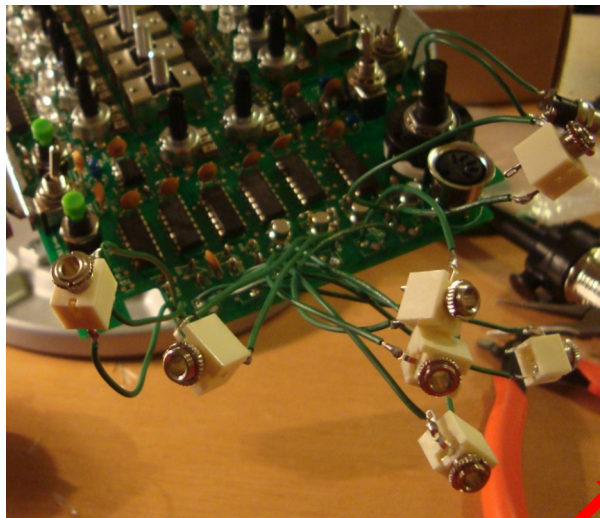
Once the leads are all attached you can begin soldering the wires to the board. The connections to the board are the same for J2 through J8 and are as shown below. The arrows point to the solder point on the board for the respective wire.
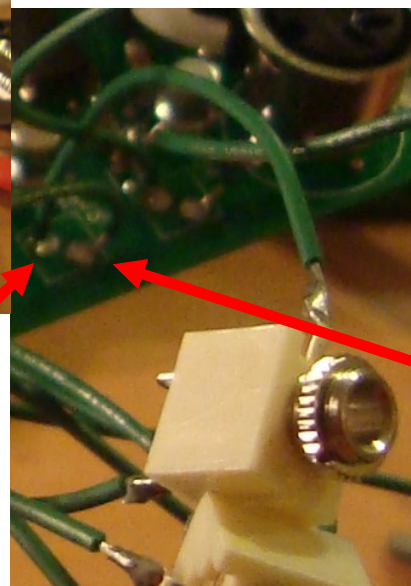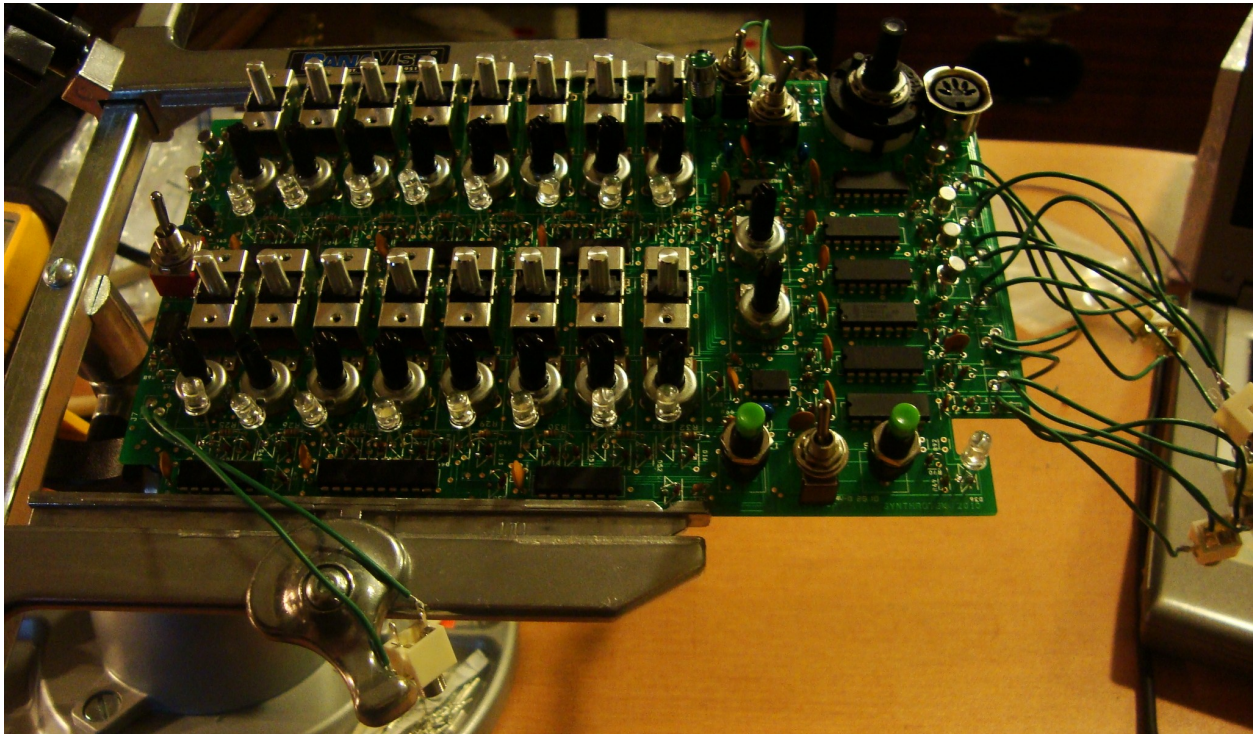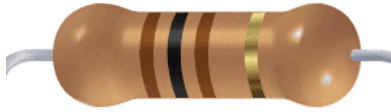
Sleeve

Tip

Congratulations!
You're Done!

Your sequencer should look something like the picture below and is now ready to be assembled in the case of your choice. You can also power it up on your workbench to test it, if you want to double check your work.
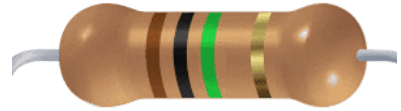
Resistor Sorting Cheat Sheet

100 Ohm   Qty 1

1M Ohm   Qty 1

330 Ohm   Qty 2

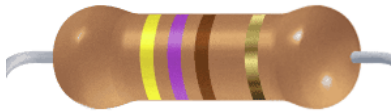22KOhm   Qty 16

470 Ohm   Qty 18

1K Ohm   Qty 11

10K Ohm   Qty 21