## Parts List for MiniPOV3 Project

<table>
<thead>
<tr>
<th>Picture</th>
<th>Name</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="IC1" /></td>
<td>IC1</td>
<td>Microcontroller (pre-programmed) Small computer chip which makes the LEDs blink.</td>
<td>1</td>
</tr>
<tr>
<td><img src="image2" alt="IC1*" /></td>
<td>IC1*</td>
<td>20 Pin Socket for the Microcontroller</td>
<td>1</td>
</tr>
<tr>
<td><img src="image3" alt="R10 R11 R12" /></td>
<td>R10 R11 R12</td>
<td>¼ W 5% 4.7K resistor (yellow purple red) <strong>Note: there are two different types of resistors with different color codes!</strong></td>
<td>3</td>
</tr>
<tr>
<td><img src="image4" alt="R1-R9" /></td>
<td>R1-R9</td>
<td>1/4W 5% 110 ohm resistor (brown brown brown)</td>
<td>8</td>
</tr>
<tr>
<td><img src="image5" alt="D1 D2 D3" /></td>
<td>D1 D2 D3</td>
<td>5.6V Zener diode</td>
<td>3</td>
</tr>
<tr>
<td><img src="image6" alt="U1" /></td>
<td>U1</td>
<td>2 AA Battery case with switch</td>
<td>1</td>
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<tr>
<td></td>
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<tr>
<td><strong>D1-D8</strong></td>
<td>Red LED</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><strong>X1</strong></td>
<td>DB-9 female connector with solder cup</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>PCB</strong></td>
<td>Silkscreened PCB</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Assembly Instructions

Check the kit to verify you have all the parts necessary.

Put the circuit board in the vise, ready for soldering!
Place the (3) 4.7K resistors as shown. Resistors are not 'directional' so don't worry which way they go in: it doesn't matter.

These resistors have the color code: yellow, violet, red

Bend the leads out so that when you turn the board over the resistors don't fall out.
Make sure your solder iron is hot, hold it with your dominant hand. Use the other hand for guiding the solder in. Now steady your hands so that you can touch the very hot tip of the iron to the lead (resistor wire) and pad (circuit board hole) at the same time. Heat the two for 2 counts then dip the solder in, you should get a nice shiny blob as shown.

Cut the leads off so that only the blob remains. Be careful, the wires can fly out at you!
Place the (8) 110 ohm resistors, just like the last time.

110 ohm resistors have the color code: brown, brown, brown

Turn the board over

Solder the leads, clipping as you go if it's too clumsy to solder around the wires.

Clip the leads

Place the three zener diodes and the serial port connector. The diodes are directional so don't put them in backwards. Note that there is a black stripe on the red glass, this stripe matches the white stripe on the silkscreen picture of the diode.

The serial port connector goes on only one way but it will be pretty obvious (because the two sides are different). The connector slides onto the end of the board and sandwiches it.
Start by soldering on the serial port connector. Make sure that you're actually soldering the pins to the circuit board (solder underneath) rather than just filling the pins with solder.

This is tricky! Please ask for help if you need it.

On the other side, solder and clip the diodes and solder the other 4 pins of the serial port connector.
For the next step, you will place the 8 LEDs. **LEDs have a 'direction' so if they're backwards they don't work.** There are two ways to tell the direction.

One is that the positive (+) lead is longer than the negative (-) one.

Third, the negative side has a flattened section (feel it with your fingers).

Place the 8 LEDs so that the negative side is nearest to the edge.

Turn the board over and solder in the LEDs, then clip the leads.
Next, place the microcontroller socket.

**Note that there is a little notch at the top, this tells you which way to put in the microcontroller.** There is also a notch in the silkscreen image so match the two sides up, it will make it less likely for you to put the microcontroller in backwards (which could damage it).

When you turn the board over, hold the socket with a finger because it will fall out easily.

Turn the board over and solder all the pins on the socket.
Solder in the two battery holder wires, red is + and black is -.

Make sure you get the wires in the right place.

You're done! Check over your work carefully to make sure there are no solder blobs where there shouldn't be.

Place the microcontroller in the socket as shown.

Have a helper check your work – they will give you two AA batteries.

Install the batteries and turn the switch on.

The LEDs should start to blink. Hold the board in your hand and wave it back and forth... you should see a glowing message in the air.

You can attach the battery pack to the back of the board with double-stick foam tape, if you like.