How to Build your Infrared 5x5x5 LED Cube

Pat McMahon– V1– 1/6/2017

Design Brief – Building a 5mm LED Cube base Jig, construct your Infrared Controlled 14M2 Picaxe 5x5x5 LED Cube, using 125 LED's.

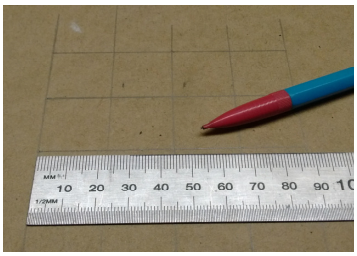
Note – The photos taken in this "How to Build" are using Pat's method of construction, but you may use your own design method.

Below are some of the Production Steps, you can use or design your own, Tick off each box as you complete a task and Document it.

Tools Required– Square, Rule, Soldering Iron, Side Cutters, Pointy Nose Pliers, Phillips Head Screwdrivers, Glue, Tape, Pencil.

NOTE– Extra special care should be taken to get an accurate Jig Base, to build the 5 Identical levels required for the 5x5x5 LED Cube.

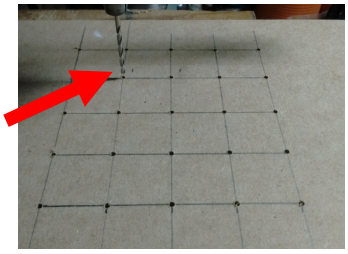
☐ **You will need a min 150 x 150 mm x 18 mm timber base.**



Mark out accurately with a square, Rule and thin pencil at

0,22,44,66,88 mm.

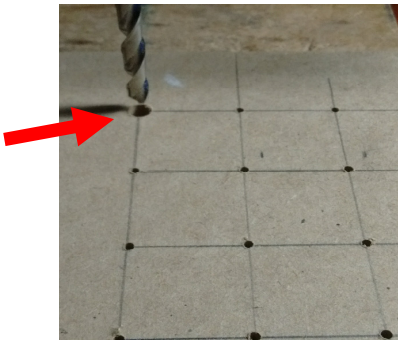
☐ **Carefully at 22 mm centres, construct a 5 x 5 Grid**



Drilling with a small pilot drill for accuracy.

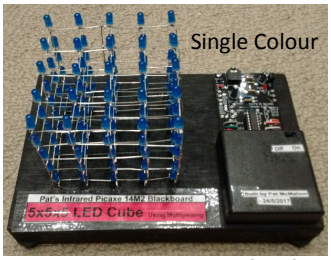
Assumes normal LED Legs of ~26/27 mm long

☐ **Drill out pilot holes with a 5mm Drill.**



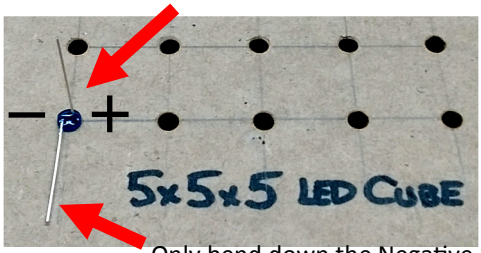
Drill to a depth so the LED sits flush, when put in upside down.

☐ **Decide on all the same colour or mixed colour LED's.**



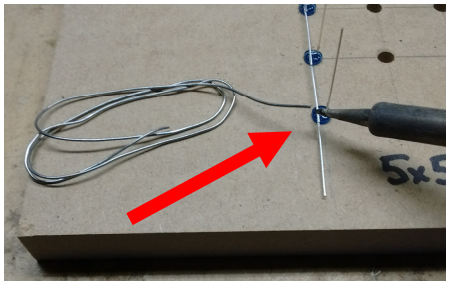
IMPORTANT- Because of different colour LED's having different Voltages, in parallel, some will display differently if mixed.

☐ **Top** **Insert the 1st LED in far bottom left Jig hole.**



Bottom Only bend down the Negative Leg.

☐ **Insert the first 5 LED's in the first column, bending down the negatives only to touch each other and solder.**



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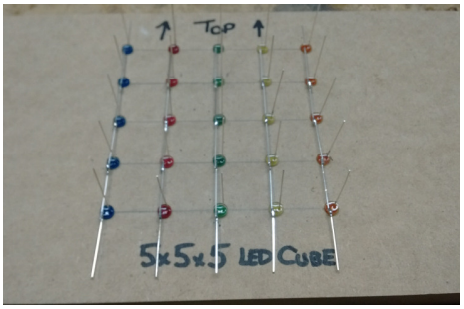
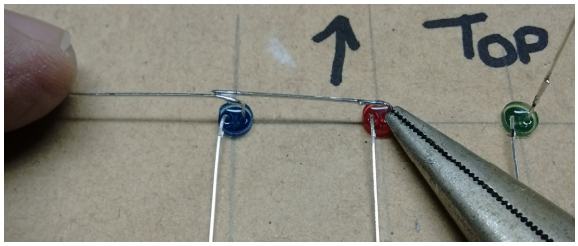
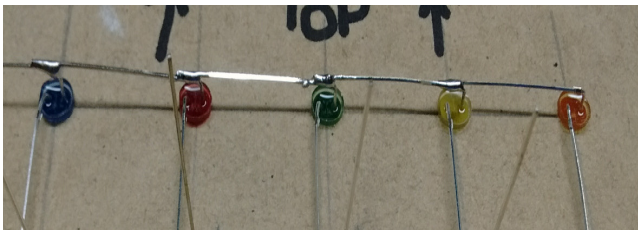
☐ **Repeat bending negatives & soldering for all 5 columns.**



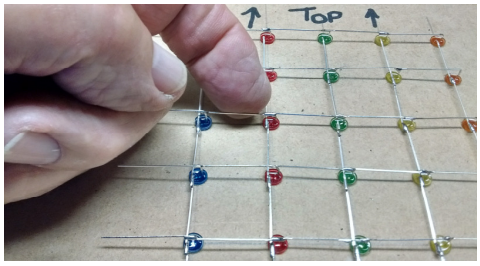
☐ **Starting in the bottom left corner, using pointy nose pliers 5 mm up, bend all the bottom row of positives to the left & onto each other without touching negatives.**



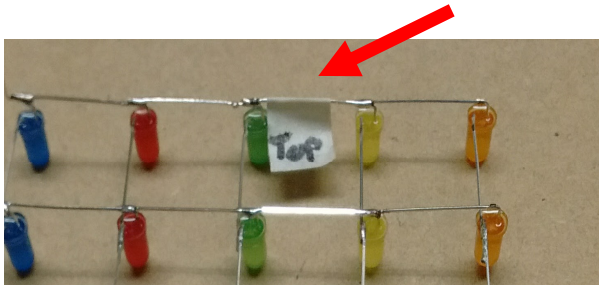
☐ **Solder the bottom row and repeat the process for each row, working to the top.**



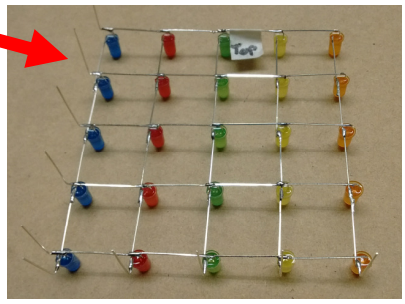
☐ **Flick the solder joints with your finger to ensure a good joint & double check with a Multimeter for continuity.**



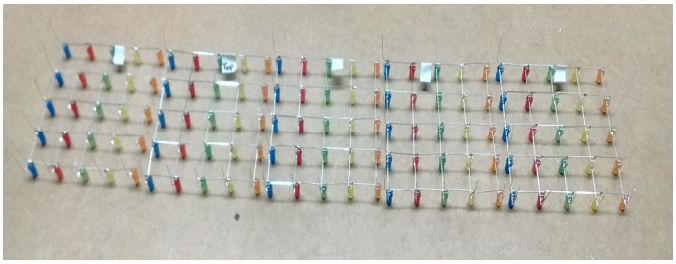
☐ **Use Tape to mark the Top, before removing from Jig.**



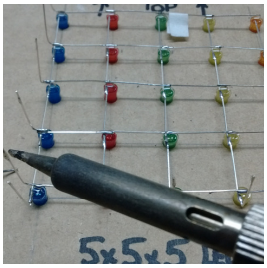
☐ **Use Pointy Nose Pliers, bend up all the protruding Positive and Negative Legs.**



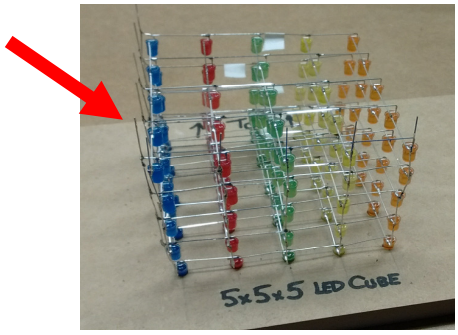
☐ **Make up 5 Levels using the previous steps, leaving the last one in the jig, to start the laying of the levels.**



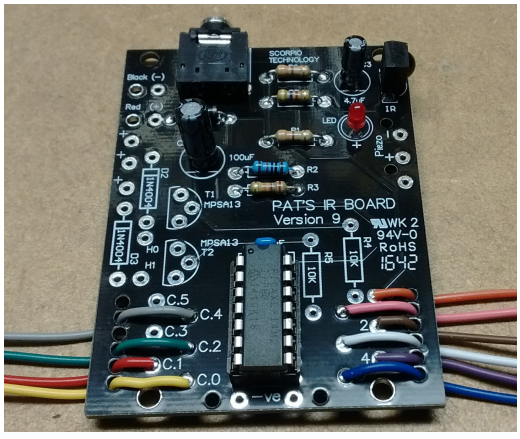
☐ **Tin the tip ends of the bent up legs for ease of soldering before trying to put the levels together.**



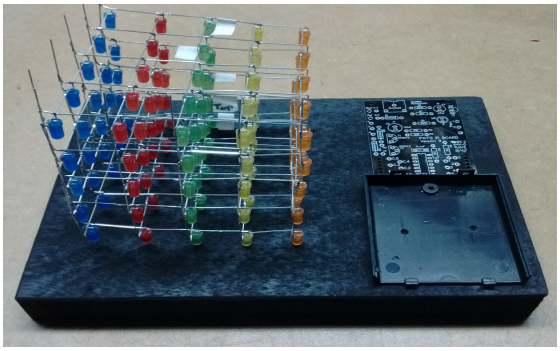
☐ **Attach the 4 levels to each other ensuring they are mounted level and at an even spacing. One side without vertical links will drop but it can be corrected later with additional wire supports. IMPORTANT– Check each level as you go for operation, as it is impossible to get to LED's not working in the inside, once soldered.**



☐ **Build up one of Pat's 14M2 Microcontrollers and insert the 10 coloured ~200mm long wires as shown.**

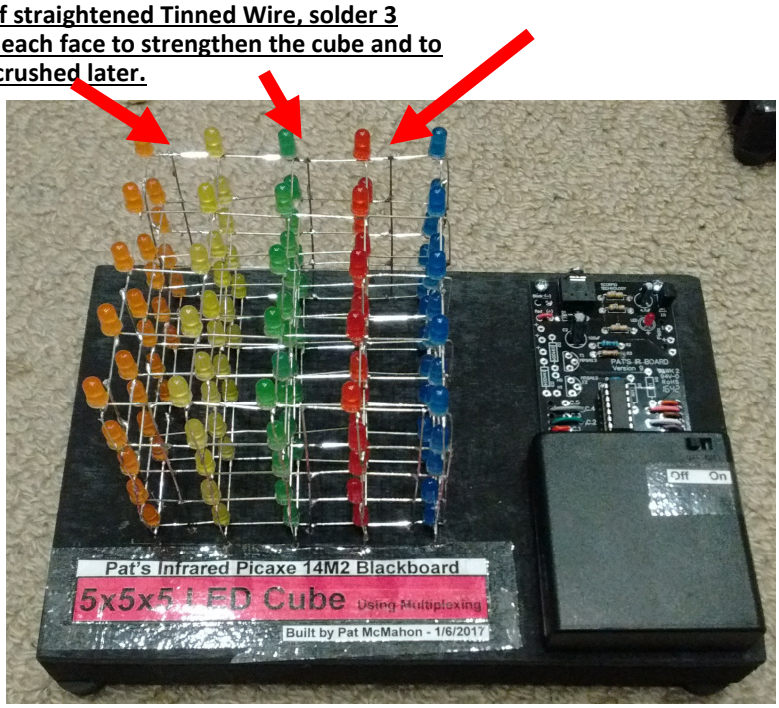


☐ **Make up a 3 Ply base ~ 220 x 150 mm to fit the Cube, Battery Box & Microcontroller, balance positioning**



☐ **Up turn the Cube, marking the Leg holes at 0,22,44,66,88 mm gaps. Drill 2mm holes when confident of positions. Insert the Cube and wires and bend over legs underneath.**

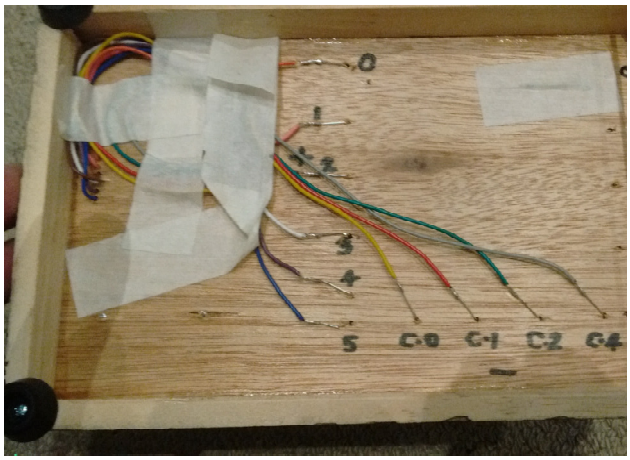
☐ **Using 12 lengths of straightened Tinned Wire, solder 3 vertical joiners on each face to strengthen the cube and to minimise it being crushed later.**



☐ **Pass the coloured wires through the 2mm holes and solder to the legs protruding through the base, when looking from the rear.**

Top row of positives to pin 0, second to 1, third to 2, fourth to 3, fifth to 4.

Left Column of negatives to pin 5, second to c.0, third to c.1, fourth to c.2, fifth to c.4.



☐ **Use a recycled 36 sliced cheese container & an elastic band to protect the Cube, when not being used.**

☐ **Use Picaxe Programming Editor, to CODE your displays. See Pat for his sample program.**

☐ **Congratulations on Constructing, Soldering and Coding your own 5x5x5 LED Cube. WELL DONE!**