How to Build & Code your own Addressable 25 LED Light Bar

Design Brief – Design your own 25 LED Light Bar and using Pat's 14M2 Picaxe Microcontroller, write code to control various visual effects of the Light Bar.

Note– Below are 3 samples of Pat's design and "How to build" to get you started. Use your own modified design and Code or use Pat's. The design's below used 5mm short leg (~17mm) LED's, 25 in total. Using the longer leg (~27mm) 5mm LED's work fine, but requires more cutting off of the longer legs at the 10mm centre spacing.
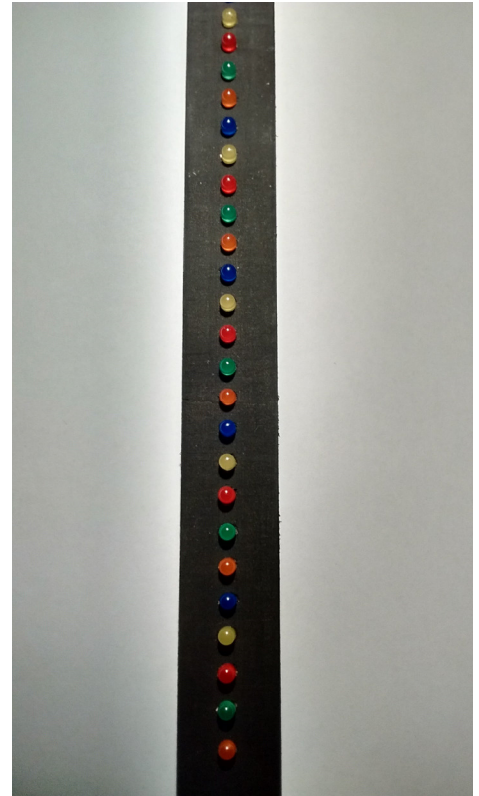
LED Light Bar

25 White LED's on
300 x 30 x 3 mm Plywood Strip
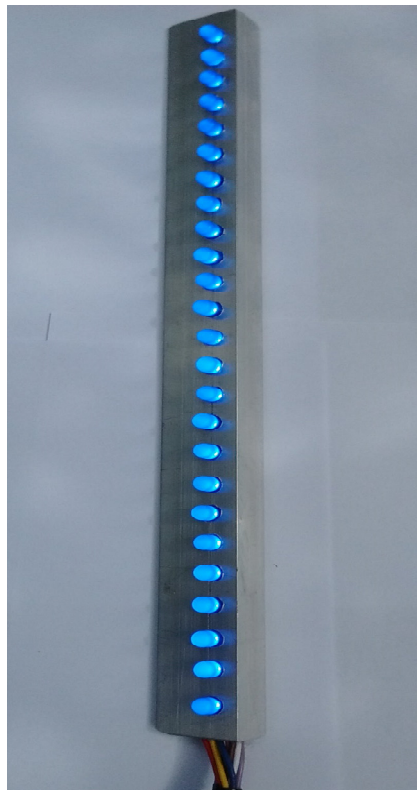
25 Blue LED's on Aluminium
Angle
20 x 12 x 1.4 mm section

25 (x5) Coloured LED's on
300 x 30 x 3 mm Plywood Strip

Below are some of the Production Steps, for the plywood strip. Tick off each box

☐ **Mark out centrally at 10mm centres, 25 positions for the LED's on the 300 x 30 x 3 plywood strip.**

☐ **Drill using a 4.8 mm (3/16") drill on plywood or a 5.0 drill on aluminium (do a test sample first to check for your LED's , as they all vary for an interference fit).**
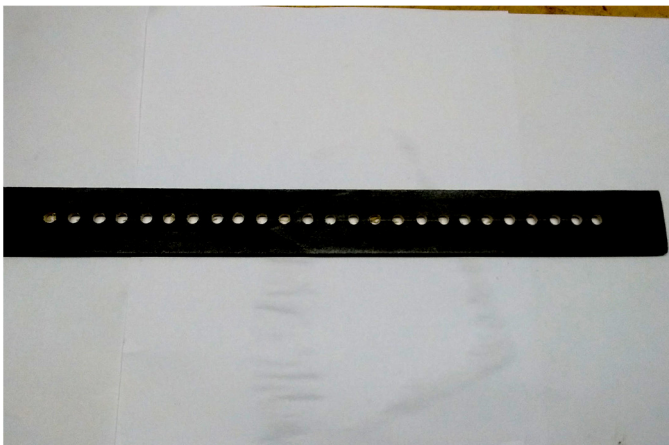
☐ **Mark one end with the top, with an arrow and UP/TOP for ease of orientation later.**
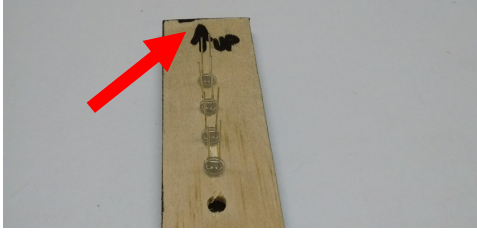
☐ **Before preceding, refer to the large schematic drawing on page 4, it may make it easier to understand the following instructions.**

Pat's 25 LED Light Bar

☐ **Lift the strip off the bench to press fit the colour LED's into the holes, ensuring first they are all facing, with the Negatives aligned left.**
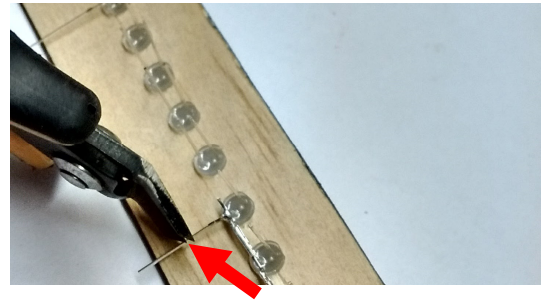
Negative **–**   **+** Positive

Flat

–   **+**
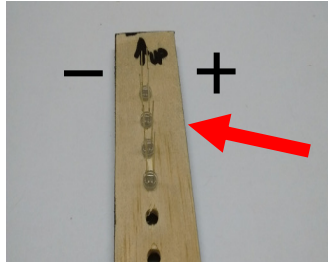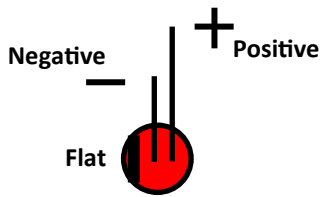
☐ **Bend over a group of 5 Positives (+) down over each other with the 5th out at right angles and solder, leaving all the Negatives (-) upright.**
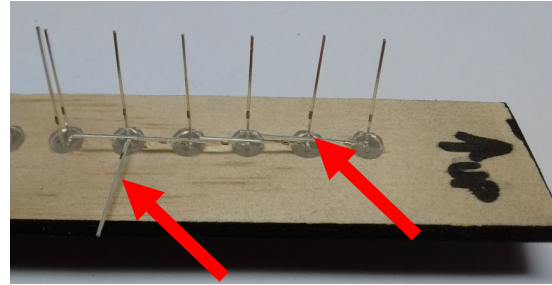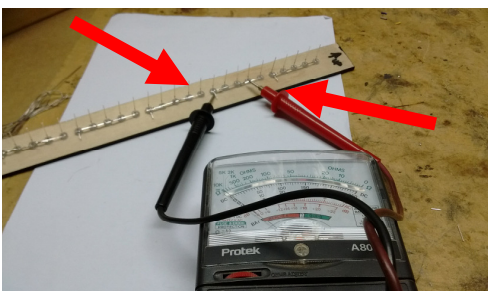
☐ **Using side cutters, cut the overhanging Positives (+) to ensure they are clear from the negatives and the next group of 5 positives.**
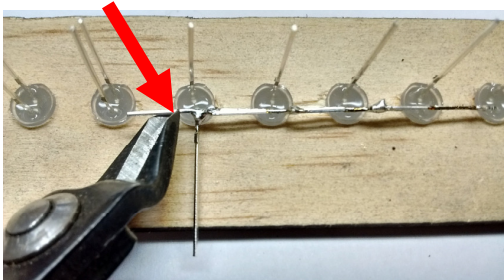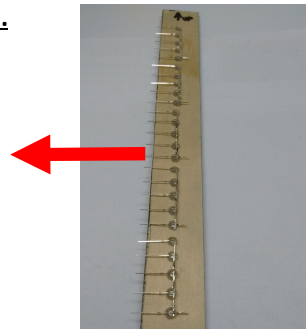
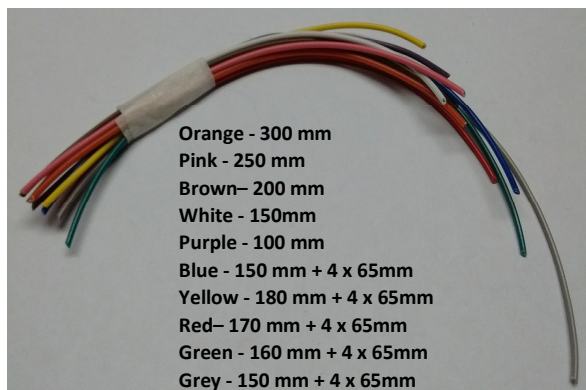☐ **Also trim the right angled 5th Positive, to fit your design.**

☐ **Carefully check each group of 5 with a Multimeter to ensure continuity of solder.**

☐ **Repeat for the other groups of 5 positives then bend out all the 25 negatives, out at right angles and trim each group on incline.**
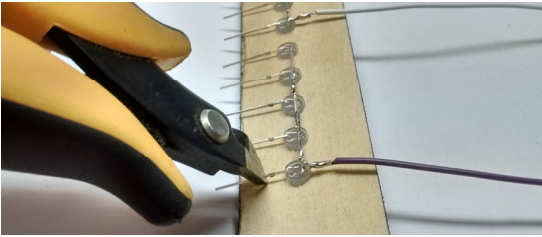
☐ **Strip & Tin both ends of the 10 coloured long wires and each group of the 4 small negative wires as shown, in the pre cut length loom below.**

Orange - 300 mm
Pink - 250 mm
Brown– 200 mm
White - 150mm
Purple - 100 mm
Blue - 150 mm + 4 x 65mm
Yellow - 180 mm + 4 x 65mm
Red– 170 mm + 4 x 65mm
Green - 160 mm + 4 x 65mm
Grey - 150 mm + 4 x 65mm

☐ **Attach the 5 coloured long + wires to the positive stubs in the order, pin 0-Orange, pin 1-Pink, pin 2– Brown, pin 3-White, pin 4-Purple.**

pin 0-Orange

pin 1-Pink

pin 2– Brown

pin 3-White

pin 4-Purple
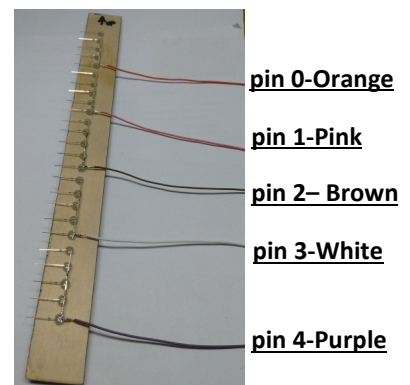
☐ **Trim the length of the 25 negatives to your desired offset length for each group of 5 LED's, for your application (see schematic)**

☐ **Tin all negative stubs then connect 4 x 65mm blue short wires together plus the long blue wire to the negative stubs on LED 1,6,11,16,21 as per schematic and solder. (easier to solder all 5 wires as a loom first and then attach as below)**
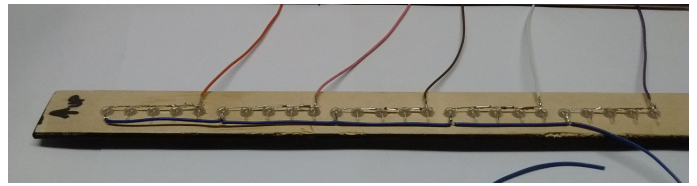
☐ **Repeat as below- (refer to schematic) on page 4)**

Yellow wires on LED 2,7,12,17,22.

Red wires on LED 3,8,13,18,23.

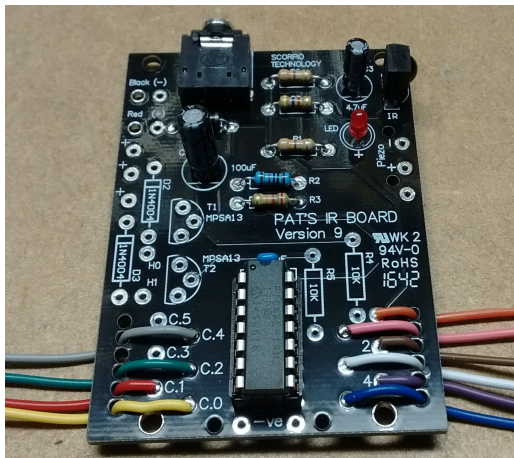**Green wires on LED 4,9,14,19,24.**

Grey wires on LED 5,10,15,20,25.

☐ **Build up Pat's 14M2 Microcontroller.**
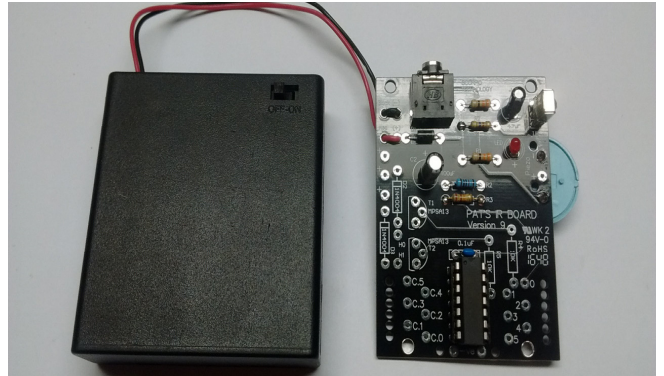
☐ **Insert the 10 coloured wires from the LED Light Bar as shown, into your 14M2 Microcontroller.**

C.4- Grey
C.2– Green
C.1– Red
C.0– Yellow

0-Orange
1-Pink
2-Brown
3-White
4-Purple
5-Blue

☐ **Trim any wires and tidy up with electrical tape.**
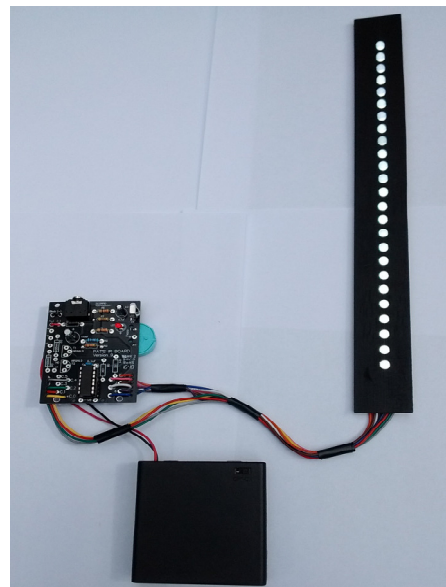
☐ **Program your own code using Picaxe "Programming Editor" or use one of Pat's programs.**
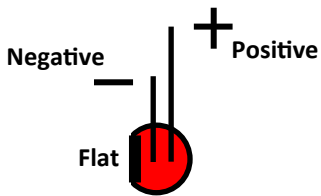
☐ **CONGRATULATIONS— On building, testing and programming your own LED Light Bar. WELL DONE!**
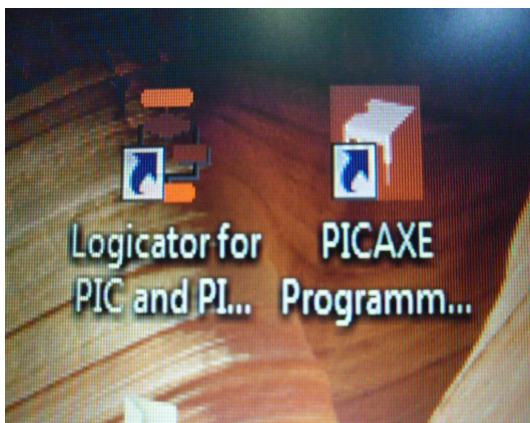
Pat's 25 LED Light Bar

Pat McMahon—V2—19/2/2018.

Note - Schematic when looking from the back of the Light Bar.

Negative

Positive

Flat

− +

Pin 5

Pin c.0

Pin c.1

Pin c.2

Pin c.4

Pin 0 (Orange)

Positives legs are bent down over each other, trimmed and soldered together in groups of five.

Negative legs are bent out at right angles and soldered with linked coloured wires.

Pin 1 (Pink)

Pin 2 (Brown)

Pin 5 (Blue)

Pin c.0 (Yellow)

Pin c.1 (Red)

Pin c.2 (Green)

Pin c.4 (Grey)

Pin 3 (White)

Pin 4 (Purple)