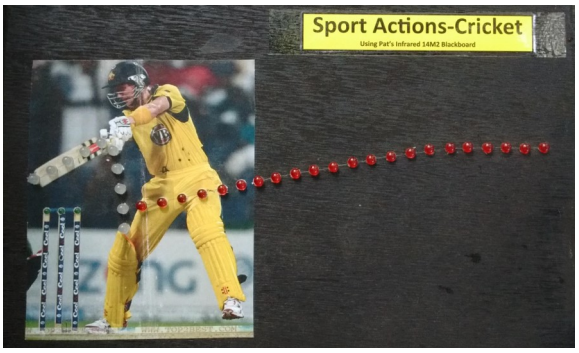
How to build your own Infrared Controlled Sports Action

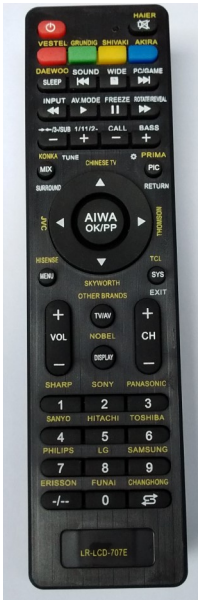
Pat McMahon– V1– 31/1/2019

Design Brief – Design your own Infrared controlled Sports Action, of your favourite Sport.

Note– Below is a sample of Pat's design and "How to build" to get you started. Use your own modified design and Code or use Pat's. The designs below used 5mm diameter LED's, up to 25 in total, depending on your design. The LED's are Coded to run by using Multiplexing on your Microcontroller.

Pat's Sports Actions (Infrared Controlled)





Below are some of the Production Steps, Tick off each box as you complete a task and Document it.

☐ **Go online and search for your favourite "Sports Action free images" and select, download and print your selection for your Sports model.**

☐ **Make up your own 3mm Plywood Base, I use A4 (~200 mm x 300mm) with 4 ,10mm wide supports.**

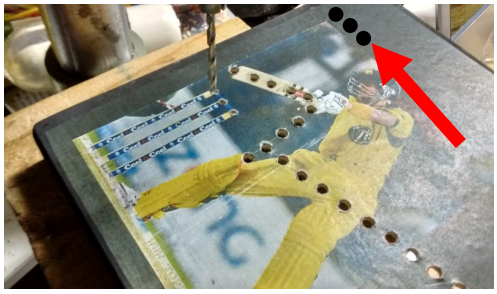
☐ **Optional- Spray the plywood frame with a Matt Black for image.**

☐ **Carefully cut out your paper Sport image to fit your plywood frame.**

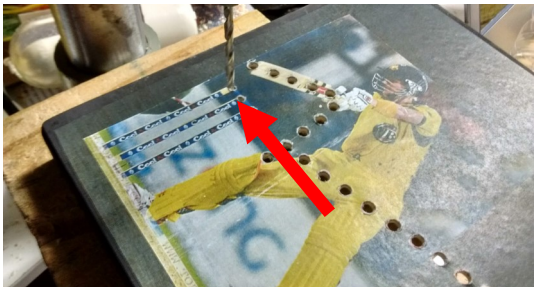
☐ **Use a Glue Stick to carefully fix the paper to the frame and let dry.**

☐ **Mark out the ball tracking in your design & the centres for your LED's, power indicator LED and Infrared Receiver.**

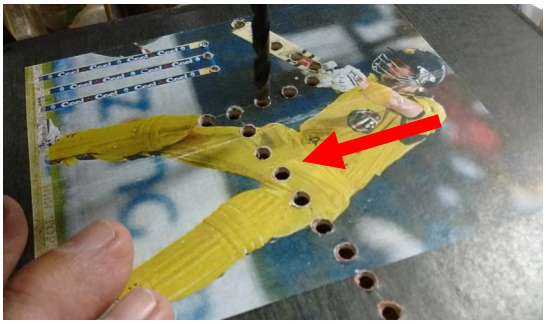
☐ **Using a 2mm diameter drill, drill 3 holes at 3mm spacings, for the Infrared Receiver.**



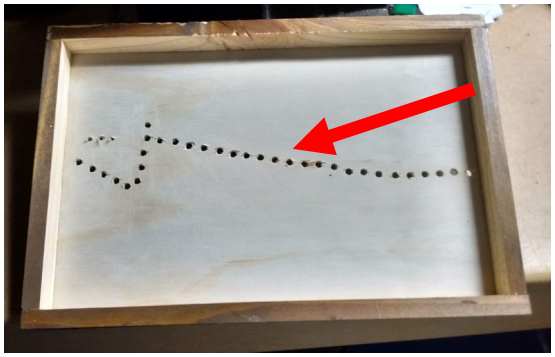
☐ **Using a 3mm diameter drill, drill holes for the 3mm power on indicator LED's.**



☐ **Using a 4.8mm or 3/16" diameter drill, drill holes for your 5mm LED's.**



☐ **Sand the back of the plywood if required, from drilling.**



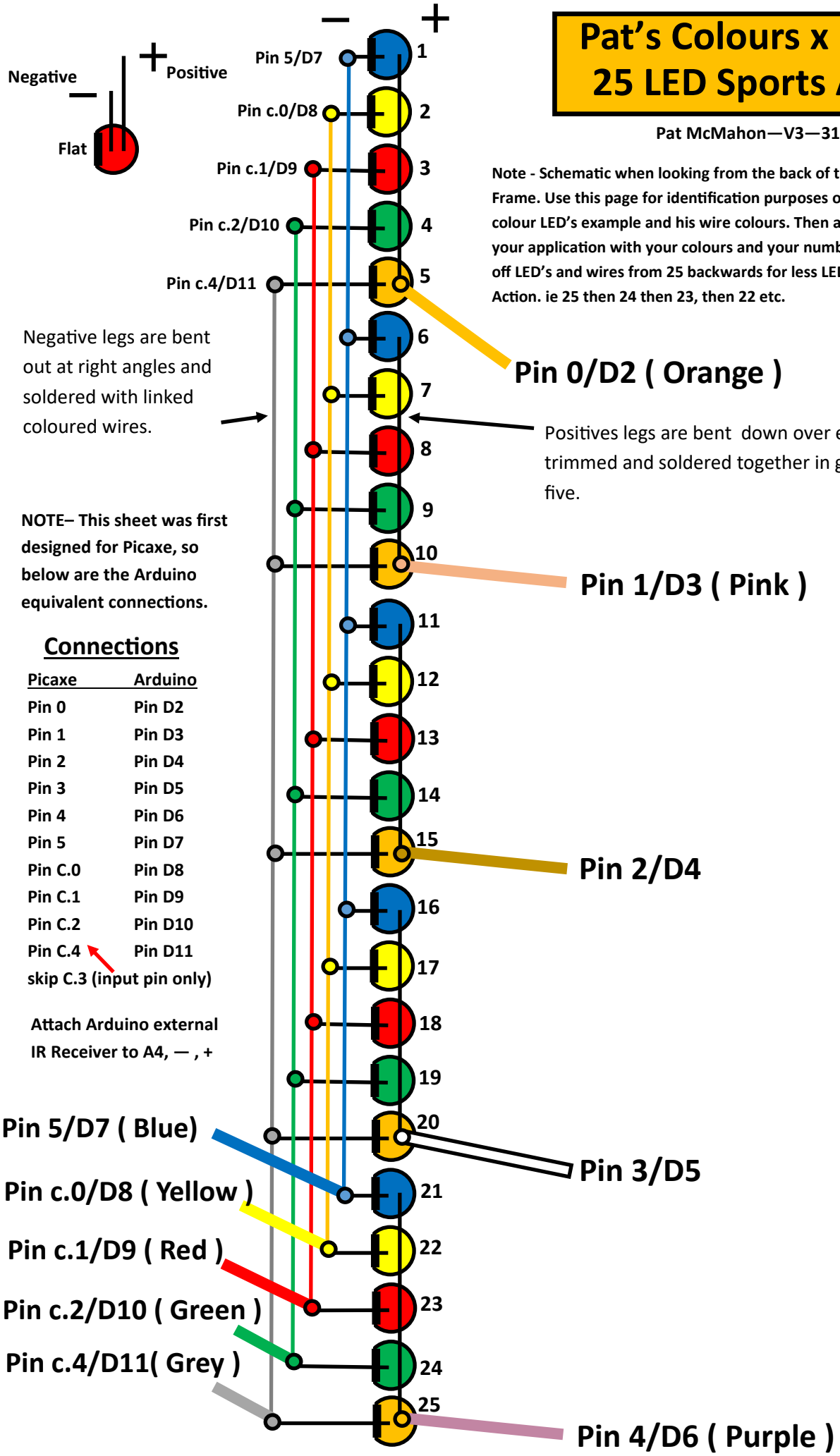
☐ **Clean the front of the plywood if required, from drilling.**

☐ **Lift the frame off the bench and insert the LED's into the back of the plywood frame, with all the short negative legs facing to the Left , all the same side. Number the LEDs 1 at the top down to 25 at the bottom, as on page 3.**

Pat's Colours x 5 LED's 25 LED Sports Action

Pat McMahon—V3—31/1/2019.

Note - Schematic when looking from the back of the Sports Action Frame. Use this page for identification purposes only, with Pat's 5 colour LED's example and his wire colours. Then adopt them for your application with your colours and your number of LED's. Leave off LED's and wires from 25 backwards for less LED's in your Sports Action. ie 25 then 24 then 23, then 22 etc.



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

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

NOTE– This sheet was first designed for Picaxe, so below are the Arduino equivalent connections.

Connections

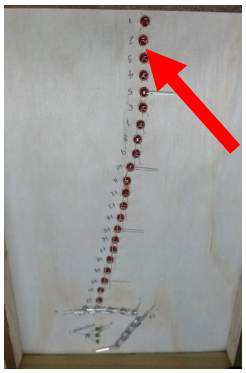
Picaxe	Arduino
Pin 0	Pin D2
Pin 1	Pin D3
Pin 2	Pin D4
Pin 3	Pin D5
Pin 4	Pin D6
Pin 5	Pin D7
Pin C.0	Pin D8
Pin C.1	Pin D9
Pin C.2	Pin D10
Pin C.4	Pin D11

skip C.3 (input pin only)

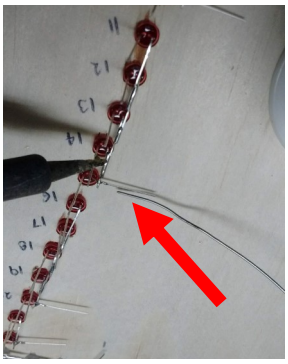
Attach Arduino external IR Receiver to A4, — , +

☐ Carefully using a flat blade screw driver, push the LED's down home, for a tight interference fit.

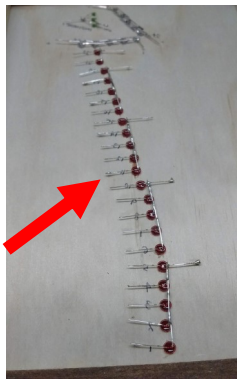
☐ Referring to page 3 for easier clarification, Bend down the Positive legs of the LED's ONLY, in sets of 5,to touch each other.



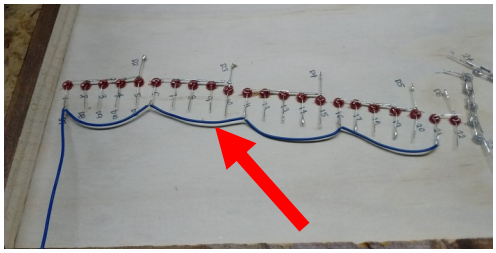
☐ Solder the sets of legs of the Positive LED's, leaving the 5th one out at right angles. Attach a Positive wire to the bent 5th leg(different colours help).



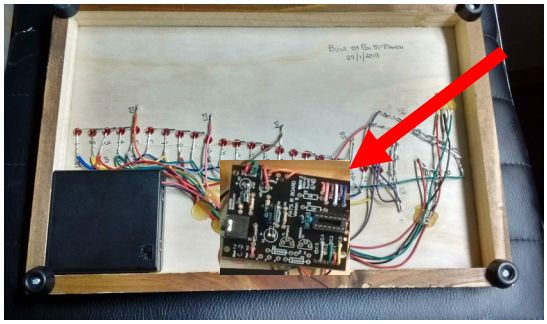
☐ Bend all of the Negative LED legs out at right angles and trim down if necessary.



☐ Loop the Negatives by connecting LED 1, 6, 11, 16, 21. LED 2,7,12,17,22, LED 3,8,13,18,23,LED 4,9,14,19,24, LED 5,10,15,20,25 with a looped wire(different colours help).

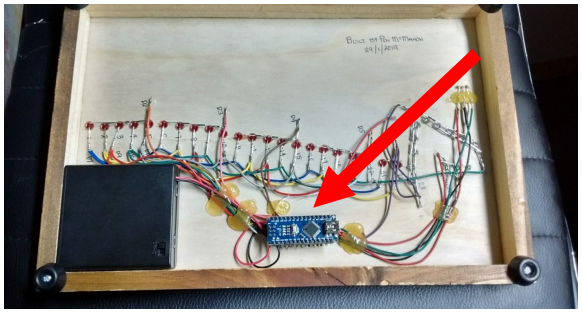


☐ Attach the Picaxe Microcontroller if using Picaxe, as per page 3 connections.

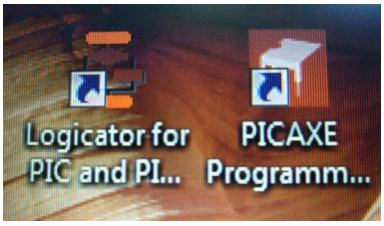


☐ Using double sided tape, attach to the back of the 6V Battery pack and attach to the plywood frame.

☐ Attach the Arduino Microcontroller if using Arduino, as per page 3 connections



☐ Using the Picaxe Programming Editor or Arduino IDE, Code your Sports Action, with your LED's to give your desired actions.

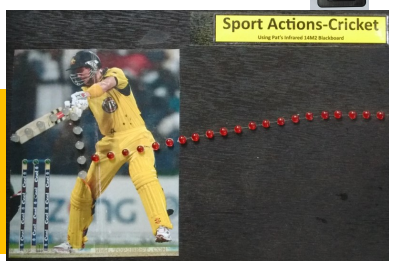


ARDUINO

See Pat's separate "How to Program" and "What each Button Does" sheet, for his Code, if required.

☐ Program the Infrared Universal Remote by pushing and holding the Red on Button & Button2 (Sony). Test your Model.

CONGRATULATIONS on Building & Coding your own Sports Action, Well Done!



Infrared Remote –M

To set to SONY Protocol

Power + 2