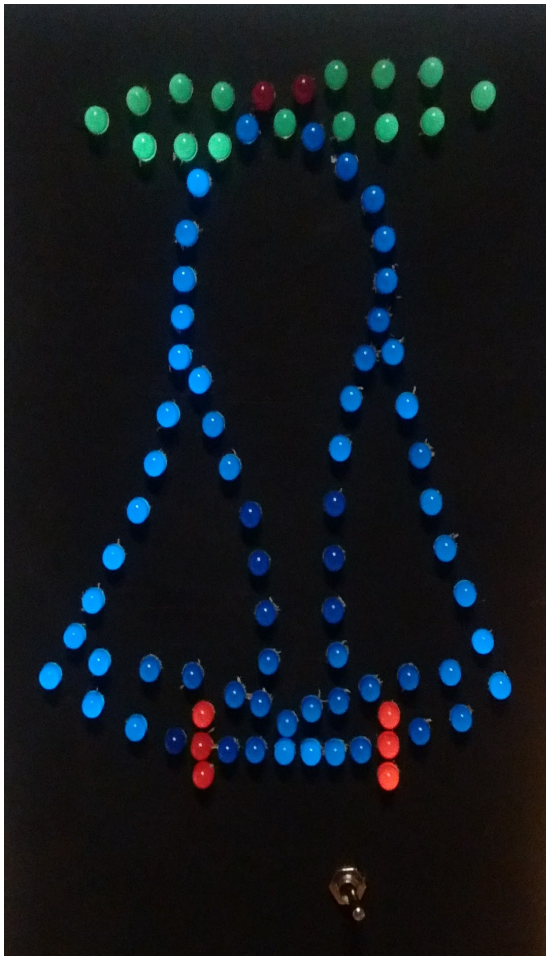
How to Build & Code your own Swinging Xmas Jingle Bell

Pat McMahon– V2– 27/10/2017

Design Brief – Design your own Swinging Xmas Jingle Bell and using Pat's 14M2 Picaxe Microcontroller, write code to control various colour LED's, to give the effect of the Bell swinging, while playing a Xmas Tune.

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 design below used 5mm short leg (~17mm) LED's, approx. 86 in total (8 Red, 15 Green, 63 White or Blue or your own choice).

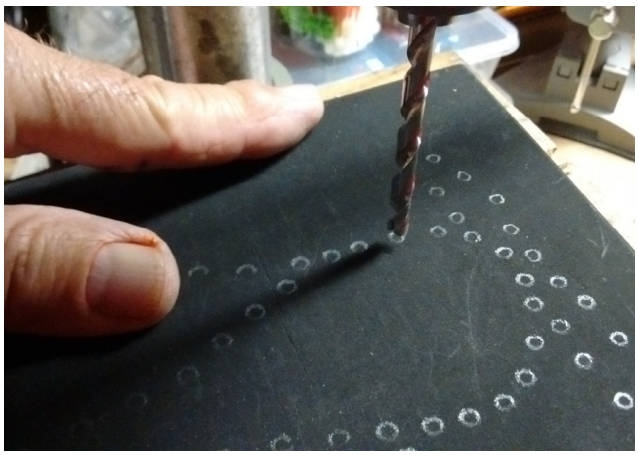
Swinging Xmas Jingle Bell



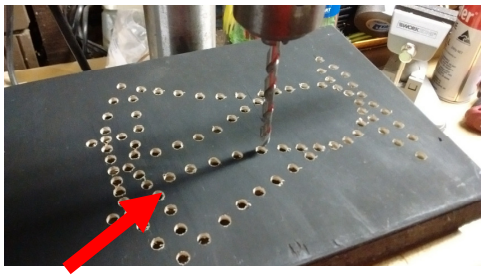
Below are some of the Production Steps, Tick off each box as you complete a task and Document it.

☐ **Make up your own 3mm Plywood Base (~150 mm x 250mm).**

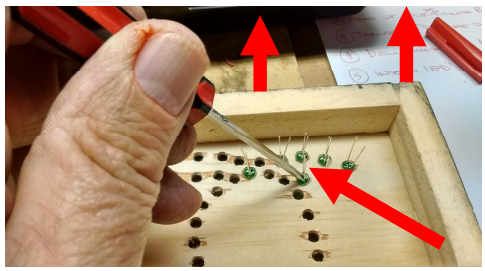
☐ **Design or Transfer the Template supplied onto the Base.**



☐ **Use a 4.8 mm (3/16th) drill to drill out all LED Holes.**

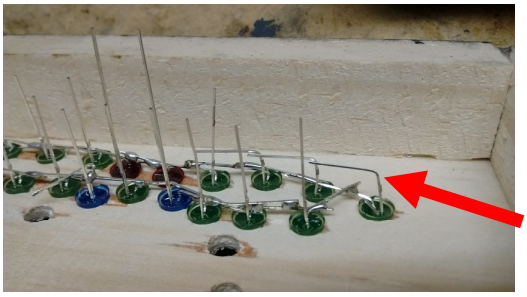


☐ **Lift base off bench to press fit the colour LED's into the holes, ensuring they are all facing, with the Negatives aligned.**

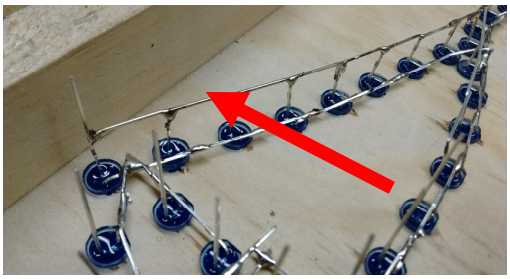


☐ **Insert top Green Leaves & Red Berries only.**

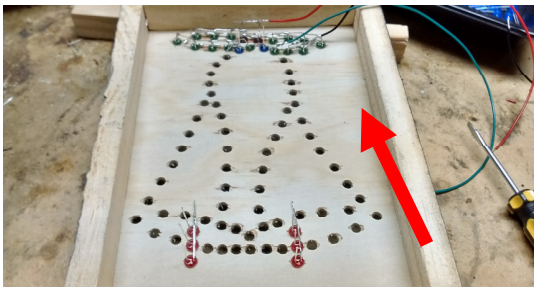
☐ **Bend over all the Negatives (—) close to the base and solder, leaving all the Positives (+) upright.**



☐ **Using pointy nose pliers, bend over the same colour LED's Positives (+) about 5mm up and solder to ensure they are clear from the negatives**

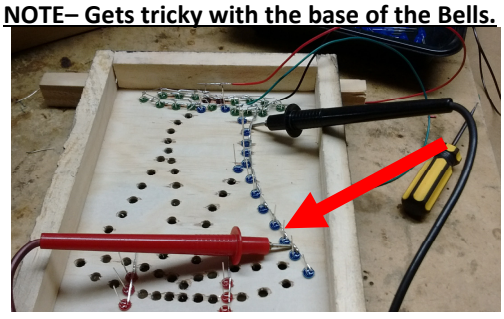


☐ **Repeat the same for the 2 red bell dongs below.**

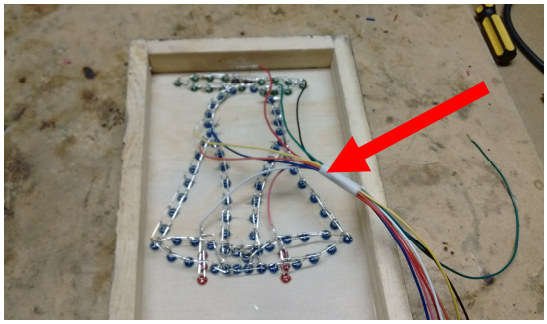


☐ **Carefully repeat for the Bell LED's, into 3 parts (Bell Top, Left Swing, Right Swing) using a Multimeter to check continuity of all connections.**

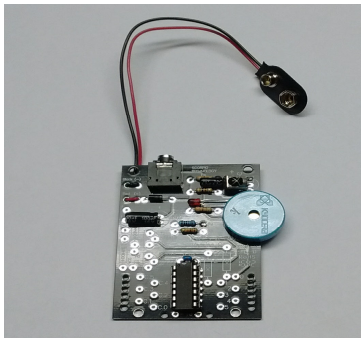
NOTE– Gets tricky with the base of the Bells.



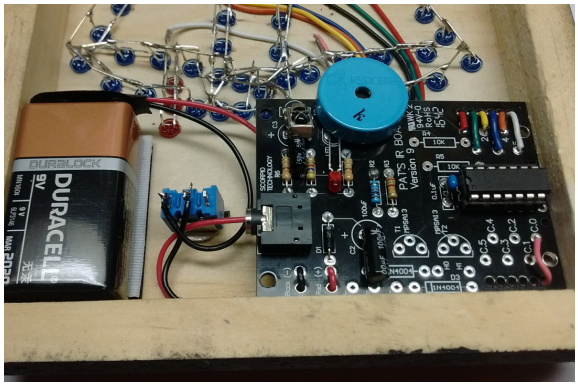
☐ **Attach colour wires to the 7 sets of LED's (see later info)**



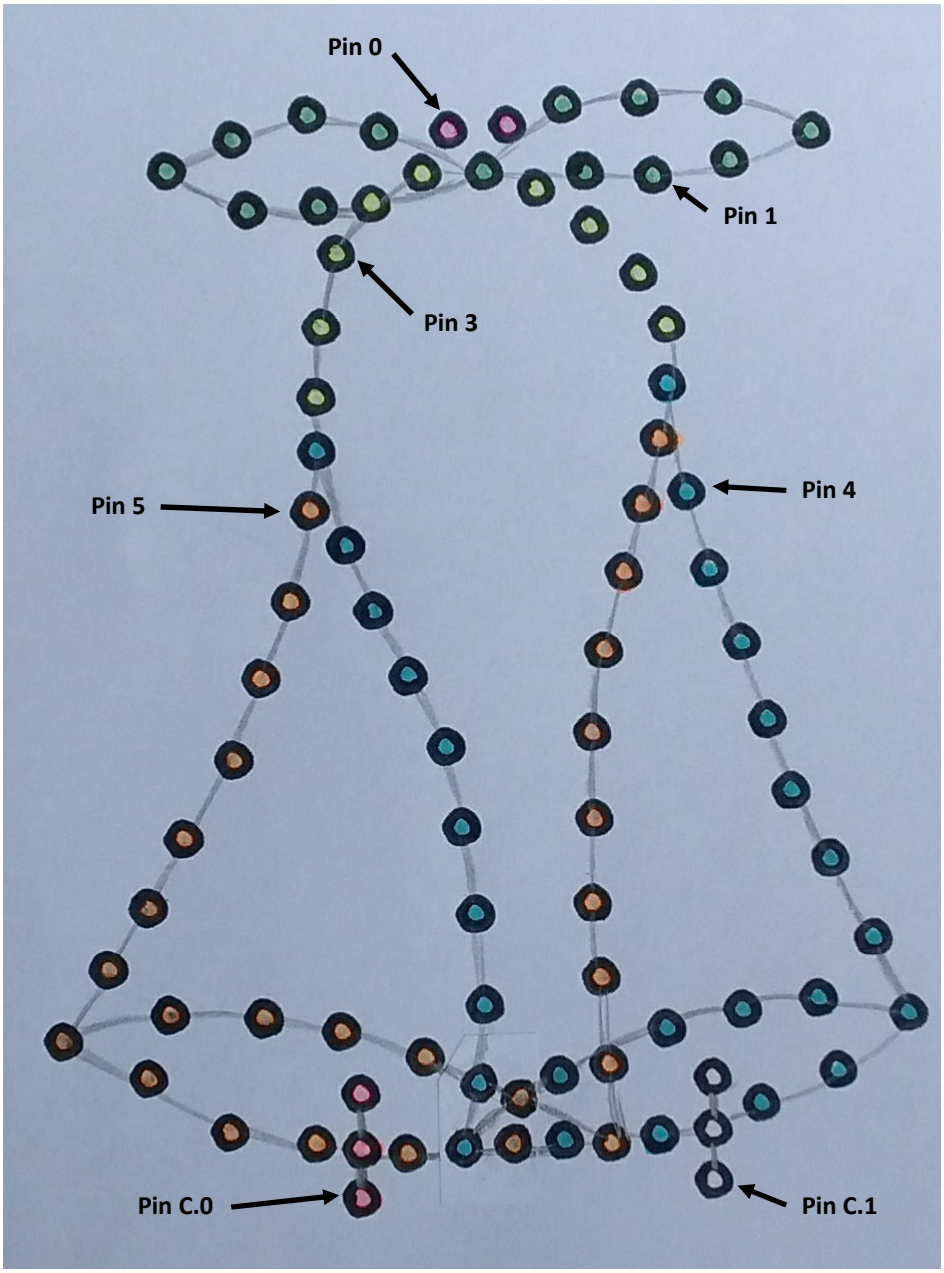
☐ **Build Pat's 14M2 Microcontroller, laying components flat to fit flat in the model base, ensuring the Piezo sounder can fit on top. Use 9V battery if limited space or 6V Switched Battery Pack.**



☐ **Use Valcrose or double sided tape to fix battery & Microcontroller to base. Cut black 9V battery snap wire, attaching to a switch for front operation.**



Pat's Swinging Xmas Jingle Bell Sample Template



Pat's Swinging Xmas Jingle Bell Sample Wire Colours to Pat's 14 M2 Blackboard Microcontroller.

Pin 0—Red Berries (Red wire)

Pin 1—Green Leaves (Green wire)

Pin 2—Piezo Sounder (No wire)

Pin 3—Top of Bell (Yellow wire)

Pin 4—Right Swing (Orange wire)

Pin 5—Left Swing (Blue wire)

Pin C.0—Left Dong (Pink wire)

Pin C.1—Right Dong (White wire)

Negative (-) (Black wire)

Pat's Swinging Xmas Jingle Bell Sample Code to type/copy into Picaxe Programming Editor and download into your 14M2 Model and run. (NOTE– All Green text below is explanation and not needed in Code).

```
`Swinging Xmas Jingle Bell
`Pat McMahon 9/10/2017
`pin 0= Red Berries, pin 1= Green Leaves, Pin 2= Piezo Sounder,
`Pin 3= Top of Bell, pin 4= Right Swing, pin 5= Left Swing,
`pin c.0= Left Dong, pin c.1= Right Dong
main:
high 0
high 1
'Jingle Bells 2 (downloaded from Picaxe Tunes Folder)
tune 2, 6,($6C,$69,$69,$29,$69,$69,$29,$69,$40,$65,$67,$E9,$6A,$6A,
      $6A,$6A,$6A,$69,$69,$69,$69,$67,$67,$69,$27,$00)

let b3=0            `Sets a variable b3 to 0
do                  `Tells the program to do the following
high 3,4,c.1        `Turns on Top of Bell,Right Swing and Right Dong
pause 1000          `Pauses for 1000 milliseconds (1 second)
low 3,4,c.1         `Turns off Top of Bell,Right Swing and Right Dong
high 3,5,c.0        `Turns on Top of Bell,Left Swing and Left Dong
pause 1000          `Pauses for 1000 milliseconds (1 second)
low 3,5,c.0         `Turns off Top of Bell,Left Swing and Left Dong
inc b3              `Increases variable b3
loop while b3<3     `Tells the variable to repeat 3 times (6 swings)
pause 200           `Pauses for 200 milliseconds (1/5th second)
goto main           `Goes back up to main to repeat continuously
```

Pat's Sample used the following 5mm LED's -

8 Red LED's

15 Green LED's

~ 63 White or Blue LED's, your choice.

approx. 86 in total.

Congratulations on creating your own Swinging Xmas Jingle Bell Model.

Now try and design another moving LED Design of your own.