



## Tools Required

- Soldering Iron
- Large Crosshead Screwdriver
- Small Crosshead Screwdriver
- Wire Cutters
- Blue Tack/Third Hand

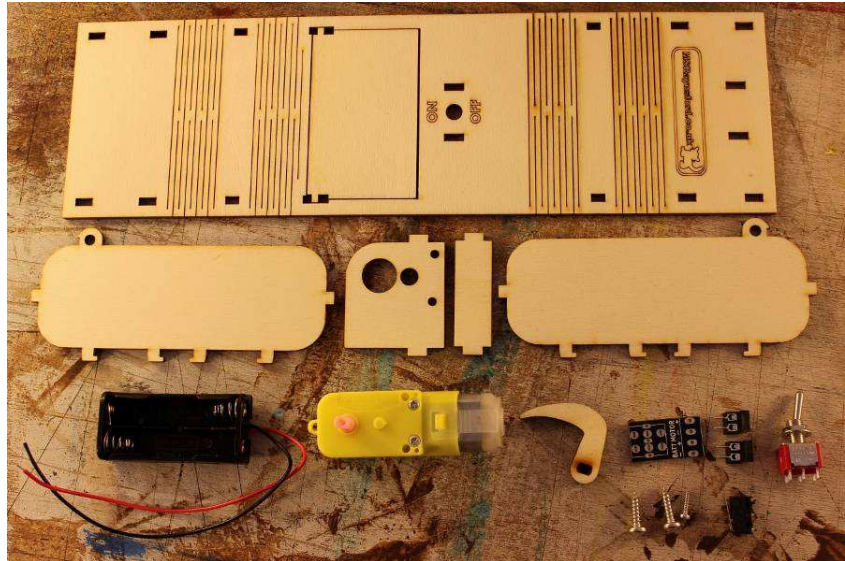
## Kit Components

### Wooden Parts

- Box Skin and Flap
- 2 Box Sides
- Motor Mount
- Spacer
- Motor Hammer

### Electronic Parts

- AAA Battery Box
- Geared Motor
- Black PCB
- 2 Screw Terminals
- Toggle Switch
- 2 Large Motor Screws
- Small Hammer Screw
- Limit Switch



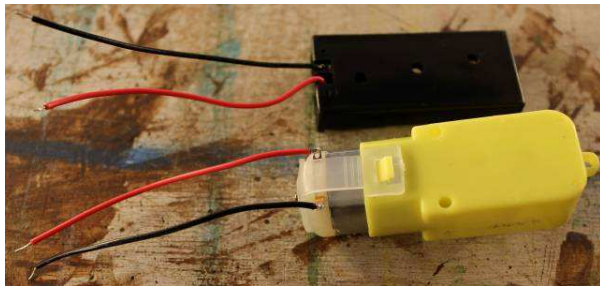
## Step 1. Fit the Toggle Switch

- Push the toggle switch into the PCB, there is a white rectangle drawn on the silk screen to show where the switch goes.
- The holes are intentionally tight, the switch should sit flush in the PCB and the terminals should not stick out the other side of the board.
- Use a small amount of solder to hold the switch onto the PCB. You want to keep the rear side flat because the limit switch should sit flush against the board.



## Step 2. Fit the Limit Switch and Terminals

- The screw terminals and the limit switch sit on the opposite side to the toggle switch.
- Solder both the screw terminals and the limit switch into place.
- The limit switch needs to be soldered from above because the toggle switch now prevents it being soldered on the reverse.



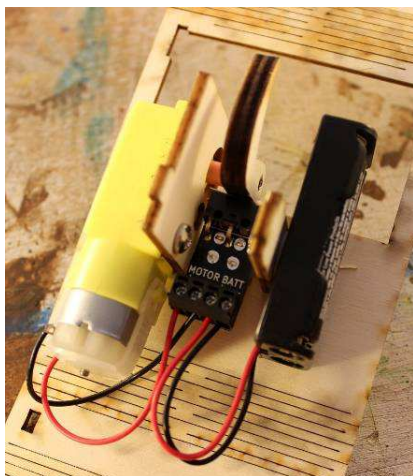
## Step 3. Prepare the Motor and Battery Holder

- Cut the battery wire holders in half.
- Strip all the wire ends and tin them with solder.
- Attach the new wires to the geared motor, ensuring that the red and black are on the correct terminals according to the image.

*'Tinning' means adding a bit of solder to the wire before you attempt to solder it to another item.*

## Step 4. Fit the Motor Mount and Hammer

- Use the two larger screws to fix the geared motor to the motor mounts. The motor shaft should pass through the motor mount.
- Use the smaller screw to fix the hammer to the output shaft. The hammer has an engraved section which should be aligned to the motor shaft.
- The small screw can be tightened right down onto the hammer, compressing the wood slightly to ensure it is on tight.



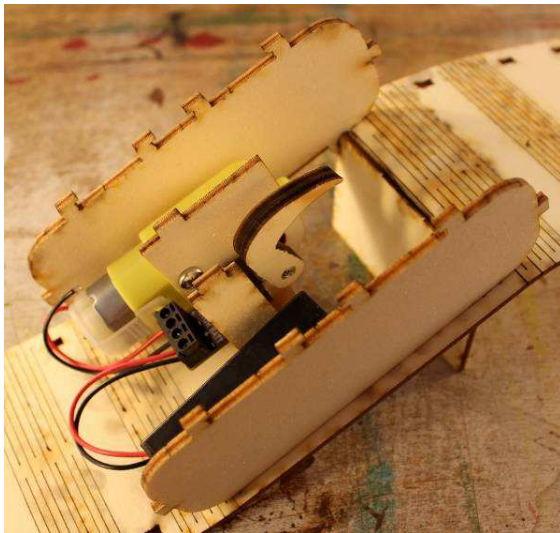
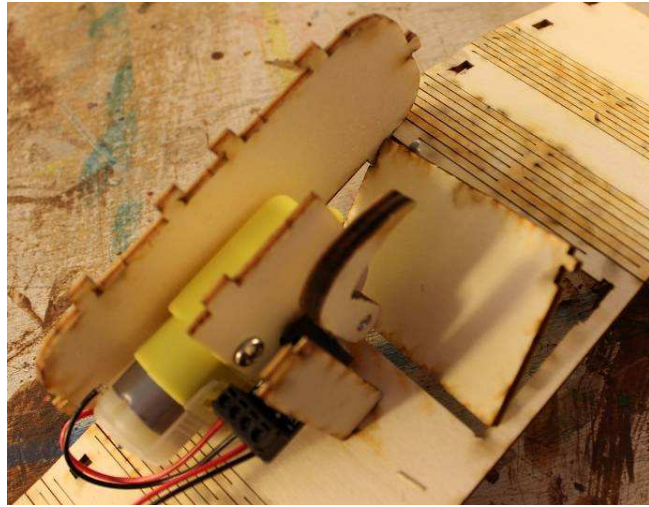
## Step 5. Place into Box Skin and Test

- Fit the toggle switch and PCB into the box skin using the circle in the middle of the skin. Use the nut and washer to hold the switch in place.
- Press the motor mount into the skin; this will hold the motor and the PCB in the right positions ready for testing, also fit the spacer into the skin.
- Screw the wires into the terminals, the motor and battery are labelled accordingly and the red wire goes to the +ve side, black to the -ve side.
- Fit some batteries, when the switch is in the 'ON' position the arm should rotate clockwise and turn the switch off. The arm will change direction and run anticlockwise until it presses upon the limit switch.



### Step 6. Fitting the Side and Flap

- Place the left hand side into the box skin. The rounded hole should fit through the skin and click into place.
- Put the flap into the skin making sure the pin sits in the hole on the side of the box. Leave the flap at a slight angle to make room for the other box side.



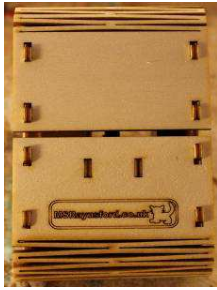
### Step 7. Fit the Opposite Side

- Place the pin of the flap into the hole on the side panel then click the side panel into the skin.
- The flap should open and close freely and both box sides should be clipped in to the flap hole.

### Step 8. Wrap the Bottom Half of the Skin

- Wrap the skin around the bottom half of the box.
- Align the spacer and the motor mount up with their corresponding holes in the bottom of the box.
- When the brackets are aligned clip the skin into the side panels and slide the skin backwards slightly to lock it into this position



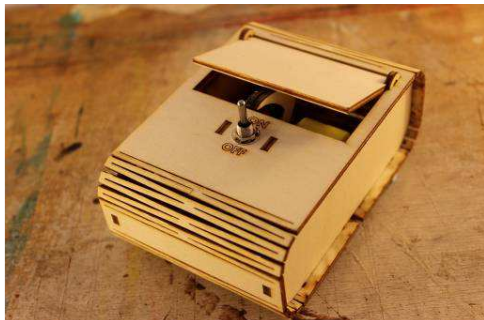
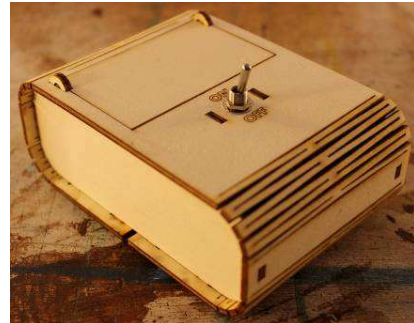


### Step 8. Wrap the Top Half of the Skin

- Wrap the top of the skin around the box, clipping it into both sides again.

### Step 9. Completed Box

- The box is now complete, turn it over and switch it on, the arm should come out of the box and turn the switch back off again.



### Trouble Shooting

- *The lid doesn't close by itself once the arm is back in the box.*  
Squeeze the sides of the box near the lid hinge, open and close the flap while squeezing. This should wear the hinge down a little bit and loosen the joint.
- *The motor does not turn in the right direction*  
Check to make sure that positive and negative wires are connected to the right terminals of the motor, see step 3.
- *The motor stops turning in either when the limit switch is pressed.*  
The limit switch is short circuiting the battery when pressed because the PCB is the wrong way round. Remove all the components and reassemble it with the correct orientation, see step 1.

