Sparrow

Scale 1/1 | Version 0.95 | Designed by Thomas Laureyssens

Color Legend
Orange: Laser cut
Black: Laser engraving
Blue: Instructions

Parts & Assemblies

Assembly — Front Section

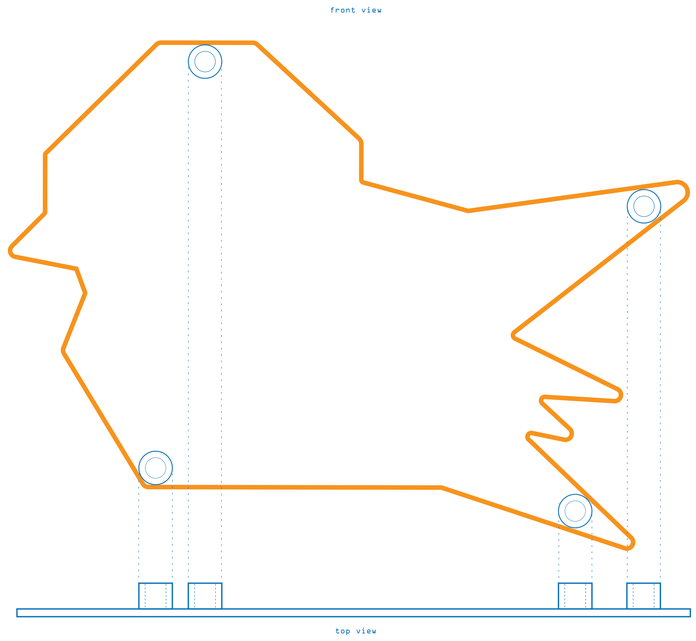
Material
Opaque Acrylic 3mm, e.g. PMMA GS Satinice DC (LED diffusion)

Instructions

hotglue

Using hotglue, fix the Bolt Attachment parts onto the engraved spots.

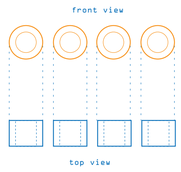
Alternatively, you could try welding the parts using aceton, but some types of LED diffusion acrylic don't weld that well, and also, the bolt attachment will probably expand slightly during use and the elastic hotglue is quite forgiving.



Part — Bolt Attachement (4x)

Material
Transparent Acrylic 10mm

Alternatively, if you don't have 10 mm transparent acrylic at hand you can also weld 2 pieces of 5mm acrylic together



Assembly — Middle Section

Materials
White Acrylic 2mm
Eye & Beak Assembly
12mm RGB LED String
- 1x50 LED or 2x25 LED
- Chip WS2801 or WS2811

Instructions

aceton brush vinyl gloves

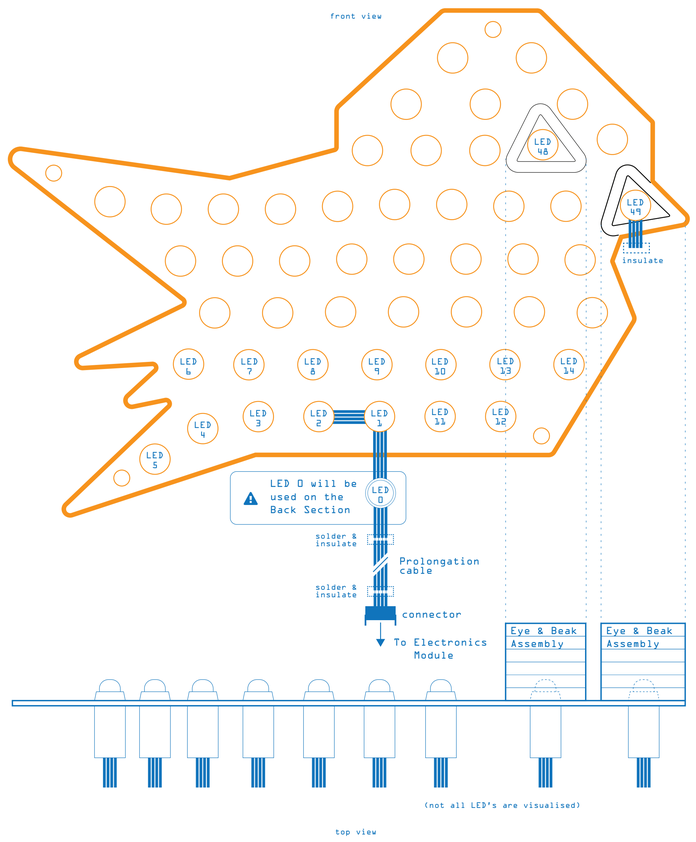
1) Weld the Eye and Beak Assemblies to the Middle Section Part at the engraved spots.

wire cutter | soldering iron | heat shrink

2) Cut the end connector from the 12 mm RGB LED string (*) and waterproof it using heatshrink or electrical tape. Cut the start connector from the LED string, and solder a maximum of 2 or 5 meter prolongation cable (**) to it. Waterproof and insulate both individual cables as well as the full cable using heatshrink. Re-attach the connector to the beginning of the prolongation cable.

3) Gently push the LED's trough the holes, starting at the second LED counting from the prolongation cable. You can choose which order you distribute all LED's, but the easiest is that the last 2 LEDs (48 and 49) are the Eye and Beak.

* To avoid confusion later in the software, the LED's are numbered 0-49 (50 total)
** A LED string with a WS2801 chip will allow a cable length of maximum 2 meter, WS2811 allows for 5 meter.



Assembly — Eye & Beak (2x)

Material
White Acrylic 5mm

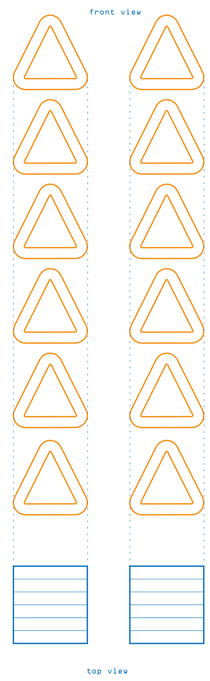
Instructions

aceton brush gloves

Weld (*) the parts together using aceton and a brush. Wear vinyl gloves.

Brush aceton on top of two parts. Wait 5-10 seconds and then push the parts tightly together for 10 seconds. Try to align the parts as neatly as possible on top of each other. Let dry for a few minutes. The easiest is to first weld the parts in pairs and later weld these pairs into the assemply of 6 parts total.

* Since aceton will dissolve the acrylic, the parts will be attached to each other on a molecular level, which is a 'weld'.



Assembly — Back Section

Material
White Acrylic 5mm

Use the engraving settings as tested with the LED Engraving Test Part

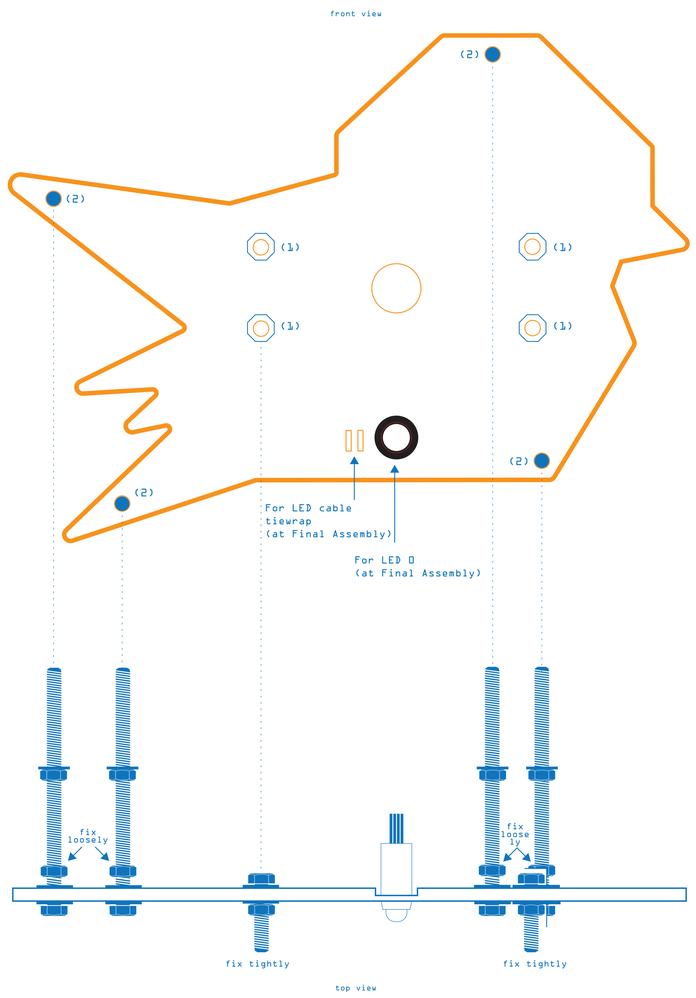
Instructions

2x Pliers | 4x Washers M6 | 4x Bolt+Nut M6x40mm

1) Tightly fit the M6 x 40mm bolts and nuts so the hexagon part of the bolt is at the top.

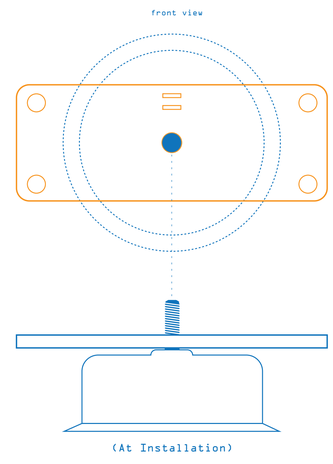
4x Washers M6 | 4x Bolt+Nut M6x90mm

2) Prepare the M6 x 90mm bolts and nuts so the hexagon part of the bolt is at the bottom. Since you will have to rotate the bolts later with the final assembly, only use a loose fit.



Part — Suction Unit Attachement

Material
White Acrylic 5mm
Suction Unit (SS-TBS) with M8X25mm threaded bar



Part — LED Engraving Test

Material
White Acrylic 5mm

This part is to find the right setting for the laser to engrave 3 to 3.5 mm deep into the 5mm acrylic. A 12mm LED should fit in the hole.

Final Sparrow Assembly

Instructions

1) Insert LED 0 in the Back Section Assembly.

Tiewrap

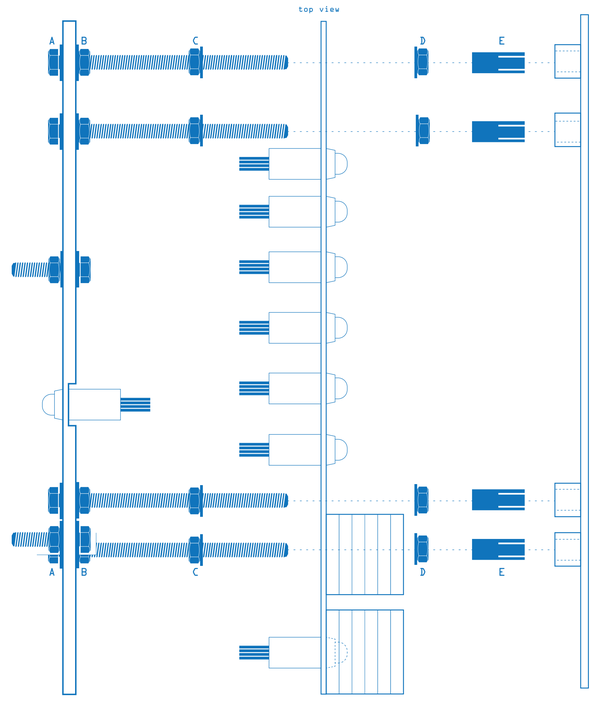
2) Use a tiewrap to secure the LED cable to the Back Section Assembly.

4x M6 Washer | 4x M6 Nut | 4x M6 Insert

3) Fit the Middle Section on the Back Section, fixing nuts and washers losely. Turn the Insert (E) on the bolts, but only loosely so they don't expand yet. Slighthly press the cables of the LED string down.

2x Pliers

4) Gently fit the Front Section on the Inserts. Turn the (A) bolts at the back of the Back Section while holding the inserts so they will slightly expand. Don't turn too much, as the Bolt Attachment Part might come loose. Fix the (B) bolts tightly. Push the Middle Section gently down so the LED cables get a bit of pressure but the Middle Section doesn't bend too much. Tighten (C) and (D) bolts.



Electronics Module

12mm LED cable colours and type can differ by manufacturer and chip type. Carefully check the documentation on your products.

Material
Olimex A20
Arduino Uno
WiFi Dongle
2.1mm female plug
LED string cable connector
USB A>B Cable (short)

Instructions

Soldering iron | Heat shrink | Pin headers

1) Solder Pin Headers on the Data, Clock and 5V cables of the LED string connector.

Pliers | Screw driver

2) Attach the secondary 5V and GND cables of the LED string connector cable to the female 2.1mm centre positive (test!) plug. Cut off and/or insulate the surplus + cable.

6x Bolt+Nut M3x30mm | Pliers | Screw driver | Tiewrap

3) Screw the Arduino and Olimex A20 to the bottom part. Attach the connectors to the bottom part using tiewraps.

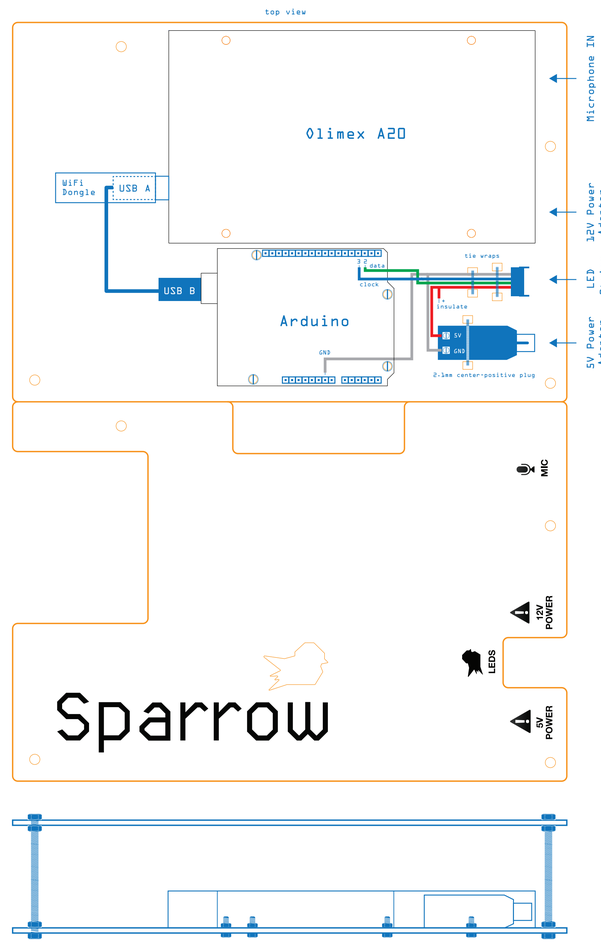
4) Connect all cables (double check the documentation that came with the 12mm LED String for the right colour codes).

5) Install the software on the Arduino and the Olimex (see separate manual on http://whistle.city)

6) Test the setup.

4x Bolt+Nut M3x30mm | Pliers | Screw driver

7) If all works well, screw the top part on the bottom part.



In-Situ Installation

Instructions are given to attach the Sparrow with a Suction Unit, which can be quickly attached and removed on windows and other perfectly flat surfaces such as metal sheets. Alternatively you can also drill a hole or attach the Sparrow to objects using clamps, bolts...

window cleaner | cleaning cloth

1) Clean surface

2) Attach the Suction Unit to the surface using the supplied lever.

3) Turn/screw the Suction Attachment Part on the threaded bar of the Suction Unit and fix with a M8 nut and washer.

4x M6 Wingnut

4) Using 4x M6 wingnuts, attach the Sparrow to the Suction Attachment Part.

Tiewrap

5) Using a tiewrap, attach the microphone cable to the Sparrow.

6) Optionally, you can add a security cable, hide the cables using tape, etc.

7) Run the cables towards the interior or the building such so they are damaged the least (between windows,...) Attach the cables and power supply to the Electronics Module. Whistle!