Blimb creation guide

ARM

The arm and the clamp are constructed from five laser cut plywood parts.

CASE A (wooden)

Laser cut and carve the following pdf files:

* <filename>
* <filename> (2)
* <filename> (2)

Then glue the parts together.

CASE B (3D printed+wooden)

This case consists of a 3D printed hull and two wooden lids (top, bottom). Use attached file <filename+file\_type> with your 3D printer. Printing the object requires the support material capability from the printer. Use the laser for carving the lids. They are attached in pdf format.

PCB SHIELD

This section needs some extra caution. Making the pcb shield requires creating drill files in fabmodules.org using the drill specific settings. To start, inspect three board layout images in attached folder “unscaled\_shield\_images”. Now follow these steps to create drill files:

1. Open the Blimb\_shield\_cuts.png in fabmodules.org
2. input format (png)
3. select output format according to your drill brand
4. select process: PCB outline
5. select your drill model from the drop-down list
6. config the cut depth to match the width of the PCB board you are using
7. change the tool diameter value from default value to 0.65mm and press calculate
8. inspect that all the wanted lines and holes are marked for drilling with blue. If not, try adjusting the tool diameter a bit and press calculate, repeating until everything looks okay
9. press save to save the drilling file
10. Repeat steps 1-9 for two remaining files, but select “PCB traces” in section 4!

It is presumed in this guide that you already possess the knowledge on how to operate the drill. Run the created files with the drill in the following order: traces, text layer, outline&holes. Inspect the PCB for short-circuits or other mishaps.

Next, solder the components on the board. Refer to the attached image for component placement. Then check the connections with multimeter.

PROGRAMMING

The Arduino C program for the device is in attached files (Blimb\_source.ino). Open the file in Arduino IDE and upload to your UNO.

For the mobile app, copy the attached Blimb\_v1\_0.apk file into a bluetooth capable Android device and install by opening it from the device.

PUTTING IT ALL TOGETHER

Parts and materials

Frame and mechanics:

Item Description Amount

4mm plywood 0.5 \* 0.5m

ABS or PLA 3D printing filament 60 cm³ (estimate)

Ninjaflex 3D printing filament (optional) 10 cm³ (estimate)

M3\*20mm screw 2

M3 nut 6

Wood glue some

Screw ~2\*10 mm Usually bundled with servos ~10

Electronics:

Item Description Amount

Arduino UNO 1

USB A Female to USB B male cable 1

USB power supply 5 V, >1.5A 1

1.4 kg micro servo HK15178 2

4.3 kg servo HK15138 2

Bluetooth module HC-05 1

Multistranded wire ~0.5 mm² A metre or two

Pin headers male and female ~40 pins

Electrolytic capacitor 470 uF 2

Resistor 1 kOhm, SMD, 1206 1

Resistor 2.2 kOhm, SMD, 1206 1

Solder

Flux (optional)

Tools

Tool What we used

3D printer Leapfrog Creatr, Stratasys Fortus 380

Laser cutter capable of cutting plywood Epilog Fusion 75 W

Milling machine Roland SRM-20

Android smartphone or tablet with bluetooth SGS3, Oppo N1

Soldering station

Wire cutters and such electrical tools