# Necessary materials

Empower yourself and understand how drones work through digital manufacturing and free hardware.

Flone is available for sale with its pieces separately to be assembled by the users themselves. This page gathers all the links of purchase online to be able to **buy it and manufacture it yourself.**

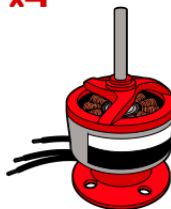Flone is composed of the **following materials** :
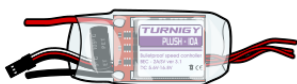
MATERIALES

x1
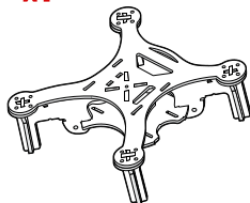
MADERA DE 5 MM

x4

MOTORES DE 1534KV 11,1V

x4

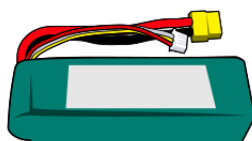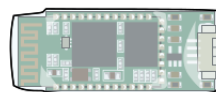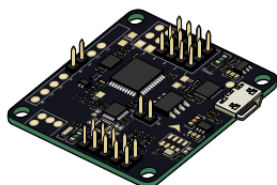HÉLICES DE 6 X 4.5

x4

ESC DE 10 AMPERIOS

x1

BATERÍA 3S 11,1V DE 1800 MAH

x1

MÓDULO DE BLUETOOTH

x1

PLACA NAZE 32

x2
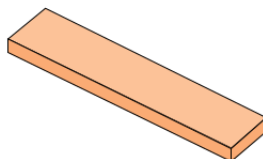
BANDA DE LÁTEX ANTIVIBRACIONES

x2
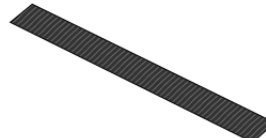
BANDAS ELÁSTICAS

x1
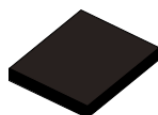
ALMOHADILLAS ADHESIVAS

x4

9CM

COQUILLA AISLANTE TÉRMICO

x2

VELCRO

You can buy a complete kit to collaborate on the project through tindie or buy the components in china through online stores. In this guide we attach the purchase links for the banggood.com store

To make the purchase we recommend dividing the order into packages of 50 euros to avoid being retained in customs .

. Wooden structure

The wooden structure is the most difficult to find if you do not have access to a laser cutter, search between the list of global fablabs or the network of laboratories makerspaces.
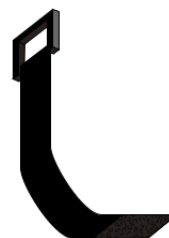
You can download the files for the laser cutter at: frame.flone.cc or you can also print it in 3D by downloading the Thingiverse 3D files .

The cost of wood (5m plywood 30 x 30) usually costs about 3 euros, you can ask for one at the nearest wood store, or at Leroy Merlin they also have 60 × 30 , it would give to make two.

The cut of the wood lasts about 12 minutes and costs **between 5 and 15 euros** depending on the place.

They have appeared professional cutters of flone in aliexpress, that sell flones already cut to a cost between 9 and 15 euros. It can be an option in case we do not have stock or do not have a laser cutter nearby.
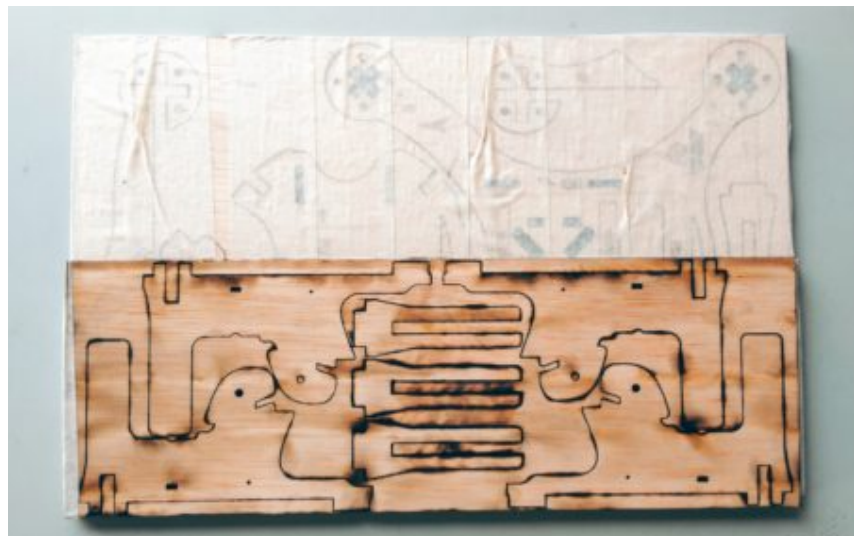
Flight plate Naze32 10DOF

For flone has maximum stability, we recommend the 10DOF version (10 degrees of freedom), this means that in addition to accelerometer and gyro of 3 axes, the plate has a barometer to stabilize the height and magnetometer to stabilize the direction.

You can find the Naze32 rev6 10DOF with 32-bit STM32 in banggood for **€ 16.27**

4 Engines.

To ensure a stable and secure attachment of the motors, they are fixed with flanges to the structure. We use these four brushless EMAX CF2812 1400KV Brushless motors for about **€ 7.97** each, which have a base that facilitates their grip with flanges. They also function as a mechanical fuse, in case of an accident the flange will break before the wooden structure or the motor shaft.

. Propellers

The propellers we use are tripala to reduce the size of flone, allowing to lift a load of about 300 grams.

The recommended tripala propellers are 6 inches and step 45 (*6 × 4.5 or 6045*). These are the cheapest we have found: 3-Blade Propeller 6 × 4.5 (CW / CCW) for **1.66 €.** Normally they tend to break, it is good to buy a spare, if you put them in different colors you can use to guide the front / back.

. Propeller adapter

To fix the propellers to the motors we use these Spinner Holders (Collet Type) 3mm   for **1.41 €.**
They are the best because they are aluminum, very small and light.

. Electronic Speed Controller

The ESC for ideal flone are those of 10 amps. For smooth flights and ease of use we recommend buying them pre-flashed with SimonK firmware. Recommended: SimonK 10A ESC with BEC for **4.61 €** .

. Battery

Depending on the weight you want to load, flone flies about 13 minutes with 3S batteries between 1500 mAh and 2200 mAh. The battery we recommend to start is this ZOP Power 1500 mAh for **12.34 €**

. Bluetooth module

You can control flone directly with an Android smartphone (which has gyro, accelerometer and magnetometer) and our free app Flone Remote with this Bluetooth module: Bluetooth Module (Level 5v) **8,5 €** In case you want to

control it with a radio control (like this FlySky FS-i6S) is also possible, connecting it to a mini receiver .

. Battery connector XT60

Flone has a design that does not require any special PDB board, so we solder the positive and negative wires from the ESC directly to the XT60 battery connector. This connector is priced at **1.06 euros** .

Total cost:

Material	Units	Unit price	Total
Wood + Cutting	1	€ 15	€ 15
Naze32 10 DOF	1	€ 16.27	€ 16.27
Motors	4	€ 8.03	€ 32.12
Propellers	2	€ 1.66	€ 3.32

Hardware holder	4	€ 1.41	€ 5.64
ESC	4	€ 4.61	€ 18.44
Battery	1	€ 12.34	€ 12.34
Bluetooth	1	€ 8.5	€ 8.5
XT60	1	€ 1.06	€ 1.06
Total cost flone			**€ 112.69**

Prices updated to February 2017.

Does not include shipping costs (normally free), nor battery charger (We recommend the SkyRC e450 for 17.99 €)

Do it yourself

To learn how to mount it, you can download the **assembly guide in Spanish** :
Drone Starting Kit .
And in English also the fltable instructable .

Recent logins

Critical use workshop for Drone technology

flone 2.5 vs Mossos d'Escuadra

Flone workshop in Barcelona at MADE Makerspace

Flone @ Sónar 2014

Workshop: Mapping the Valldaura mountains

Workshop: Mapping the Valldaura mountains

Telefónica
Investigación y Desarrollo

laboral
Centro de Arte y Creación Industrial

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Designed by aeracoop