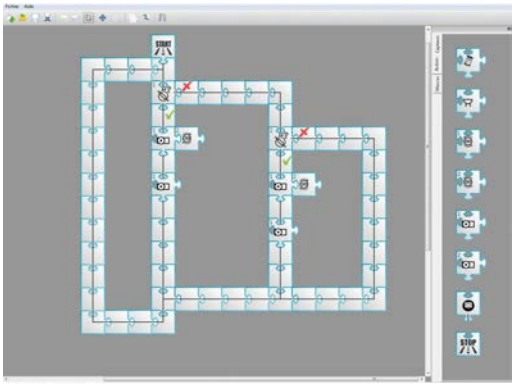
CONTENTS

Welcome to the world of robots.

Using this kit, you can build a moving model which is propelled riven by a geared motor without a differential and directed by a servomotor.

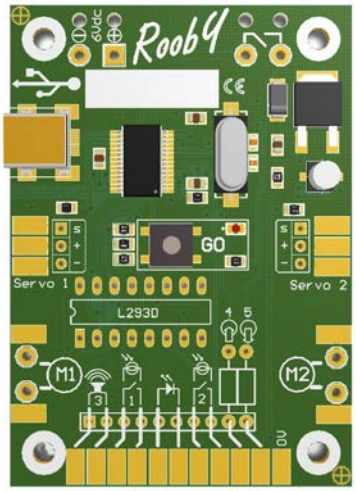
Guided by the Rooby circuit board, ref. 181301, familiarise yourself with the simple and intuitive programming by using the Rooby Pilot software which can be downloaded for free at www.espace-groomy.fr



Connect your PC using a USB 2.0 AB cable, ref. 283476, the intuitive visual programming software will allow you to easily program your circuit board based on your wiring.

Give free reign to your imagination and solder up to two servomotors, two direct current motors, limit switches onto the wide reinforced circuits....

The Rooby circuit board is powered by a 6V direct current supply using a 4 AA battery holder, connected to the circuit board via a 9V clip.



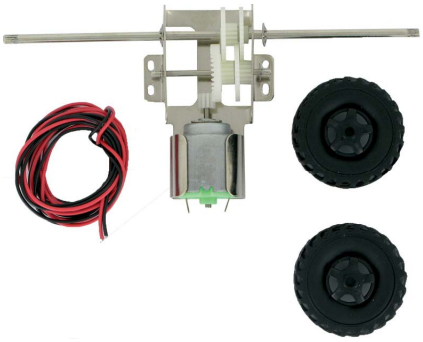
Rooby circuit board, ref.

4 AA battery holder
ref. 315449

9V Clip
ref. 315437

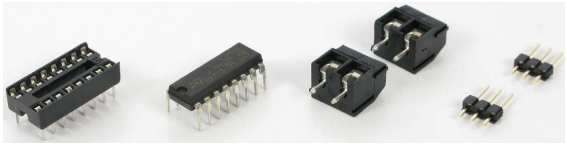
USB cable
ref. 283476

Servomotor
ref. 315434

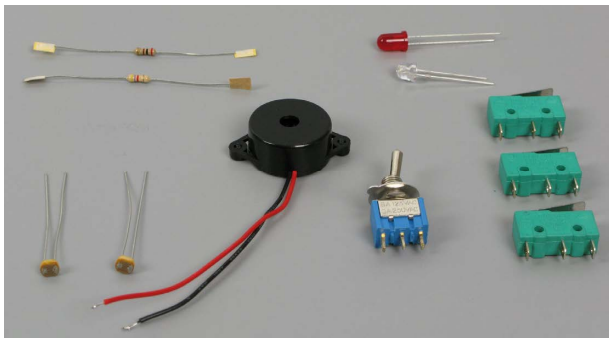


Geared motor with wheels
ref. 283469

Set of two front wheels
ref. 315495



Motor control kit
ref. 181302

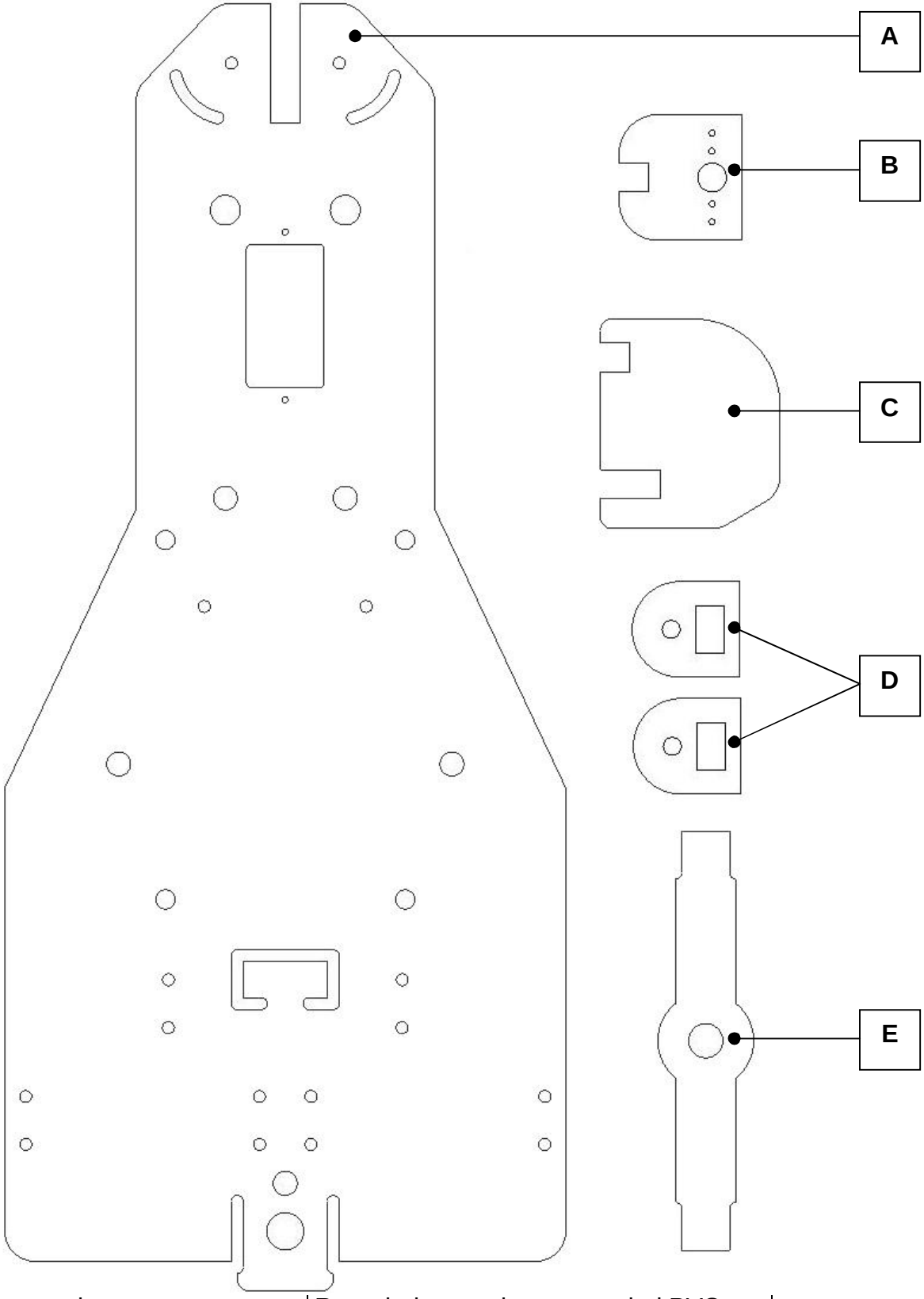


Rooby option kit
ref. 181303

Pack of fastenings ref. 312731

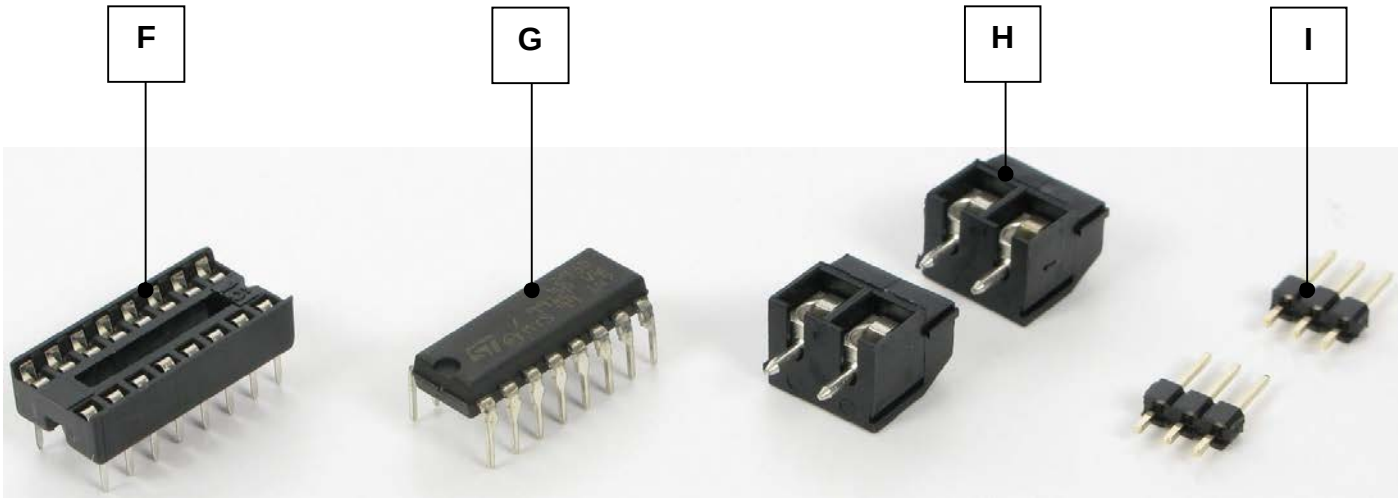
Machined sheets

JEULIN	Rooby ***Programmable 4-wheel robot, machined***	© 2013	**DOC: 3**
	KIT CONTENTS	**V 1.0**	**Product ref.: 181250**

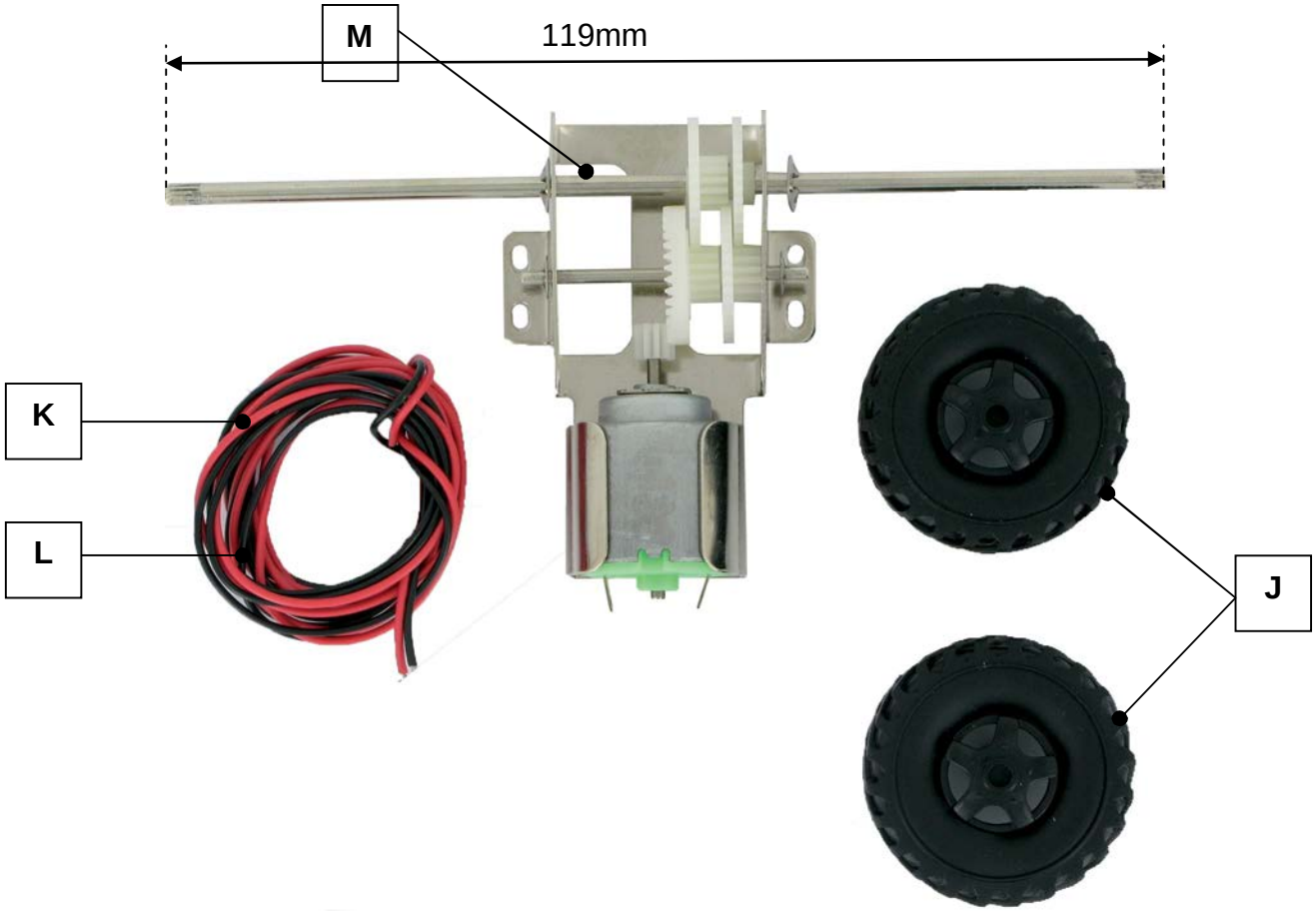


Reference	No.	Description	Properties
E	1	Front axle	Recycled two-colour expanded PVC
D	2	Wheel mounting	Recycled two-colour expanded PVC
C	1	Nosepiece	Recycled two-colour expanded PVC
B	1	Line tracer mounting	Recycled two-colour expanded PVC
A	1	Base	Recycled two-colour expanded PVC

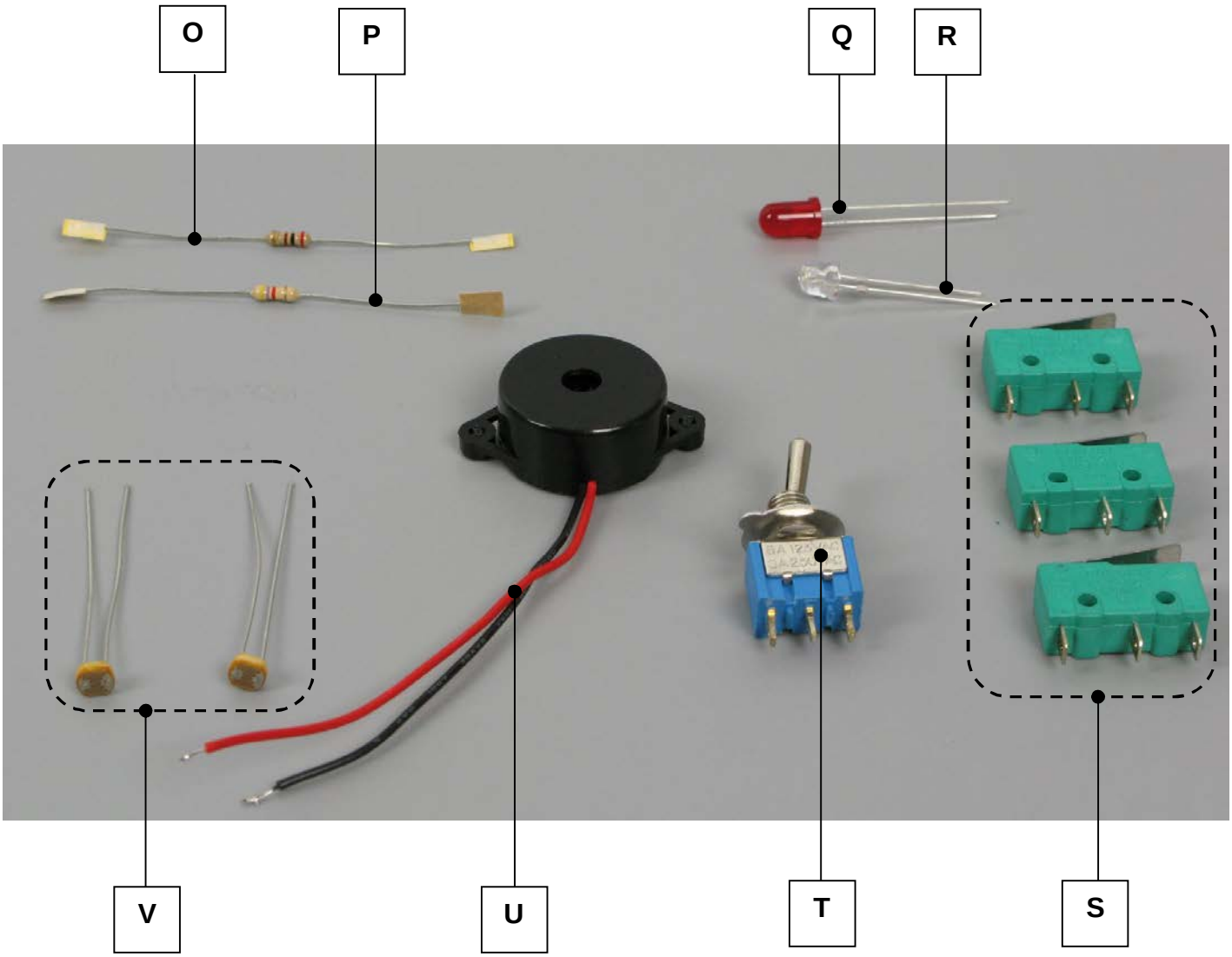
JEULIN	Rooby *Programmable 4-wheel robot, machined* **MACHINED SHEETS PARTS LIST**	© 2013	**DOC: 4**
		V 1.0	**Product ref.: 181250**



Reference	No.	Description	Properties
I	2	3-pin connector	2.54mm pitch
H	2	Solder screw terminal	2 contacts, 5.08mm pitch
G	1	4 channel motor driver	16 pins
F	1	Integrated circuit mount	16 pins

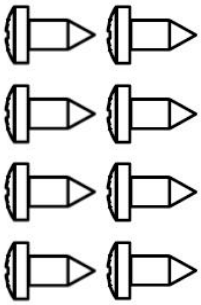


Ref	No.	Description	Properties
M	1	Geared motor	Supplied assembled
L	1	Black wire	Length 1 metre
K	1	Red wire	Length 1 metre
J	2	Wheel Ø 35mm	

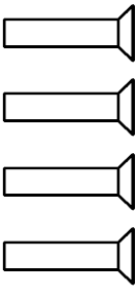


Reference	No.	Description	Properties
V	2	LDRs	
U	1	Piezo oscillator buzzer	With wires
T	1	Toggle switch	On-Off
S	3	'Moustache' limit switch	With long levers
R	1	White LED Ø5mm	
Q	1	Red LED Ø5mm	
P	1	Resistor 4.7kΩ 1/4W	Carbon film
O	1	Resistor 200Ω 1/4W	Carbon film

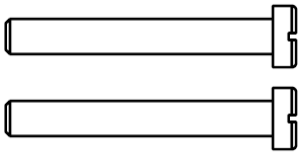
OPTION KIT PARTS LIST
ref. 181303



Self-tapping screw 2.9 x 6.5mm

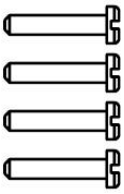


Countersunk screw M3 x 14mm

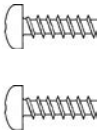


Pan head screw
M4 x 30mm

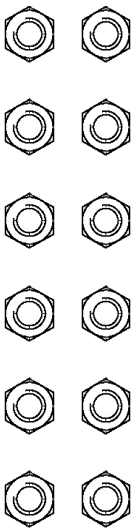
Pan head screw M2
x 10mm



Pan head screw M2 x 30mm



Ecosyn screw 2.2 x
8mm



M3 Nut

M2 Nut

M3 Tooth lock washer

M2 Washer

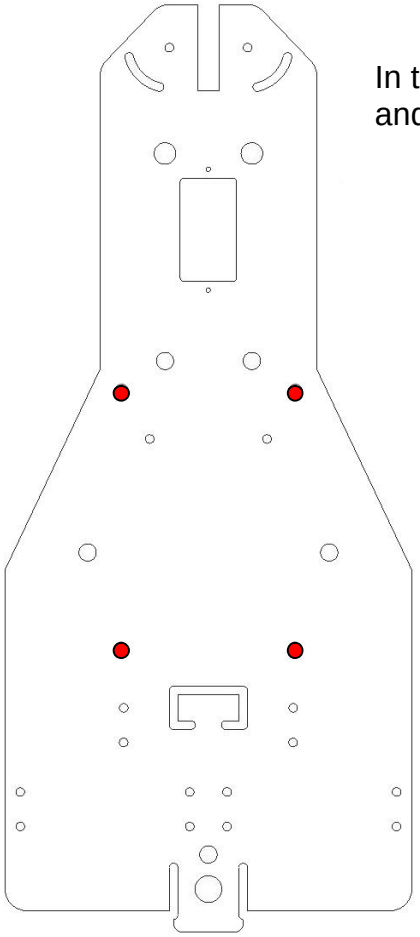
Cable tie L=100mm

Elastic band

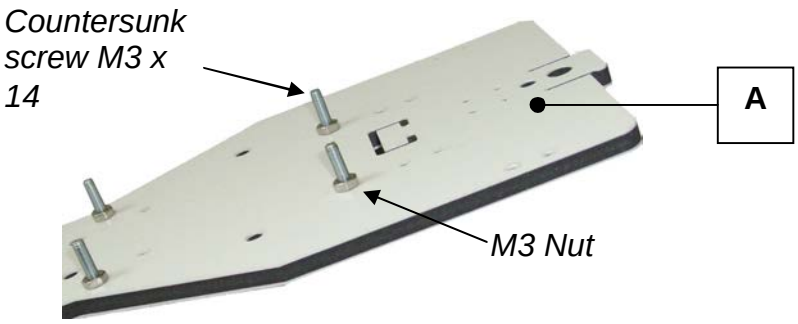
JEULIN	Rooby *Programmable 4-wheel robot, machined* **FASTENINGS PACK PARTS LIST** **ref. 312731**	**© 2013**	**DOC: 8**
		V 1.0	**Product ref.: 181250**

Assembly of circuit board mountings:

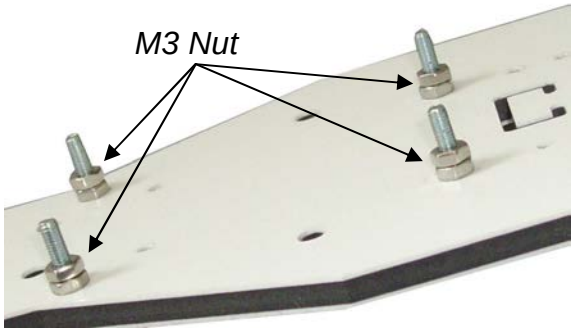
Parts required: 4 M3 x 14mm countersunk screws, 8 M3 nuts, the base (A)



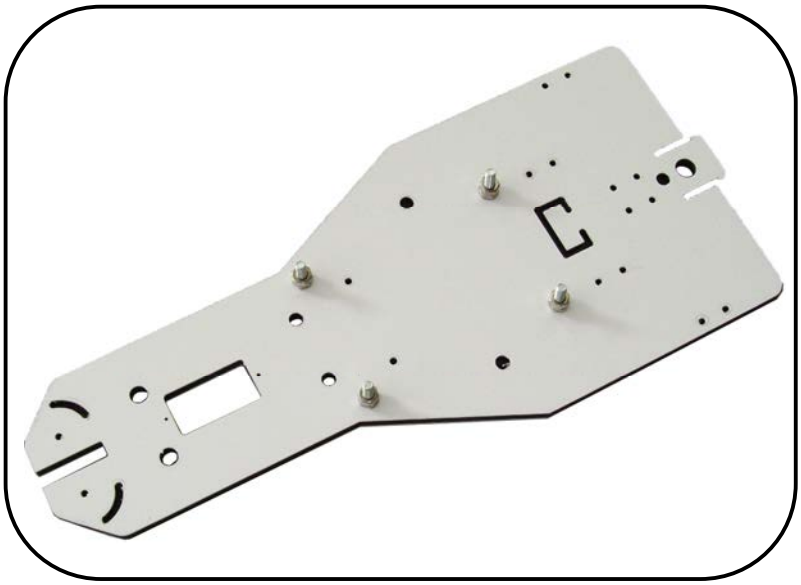
In the places marked below, screw one M3 x 14mm countersunk screw and 2 M3 nuts per position into the base (A).



When fastening the first nut, fully tighten it so that the head of the screw is flush with the base

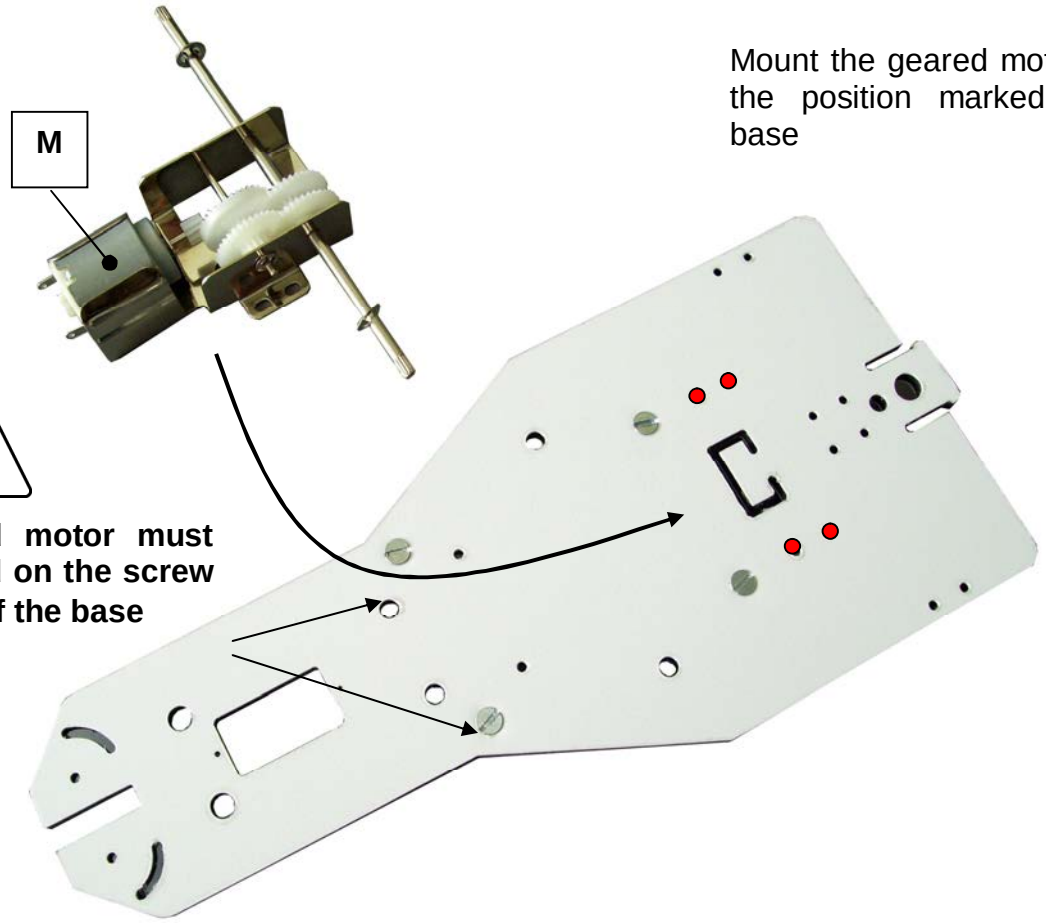


Add a second M3 nut on each screw



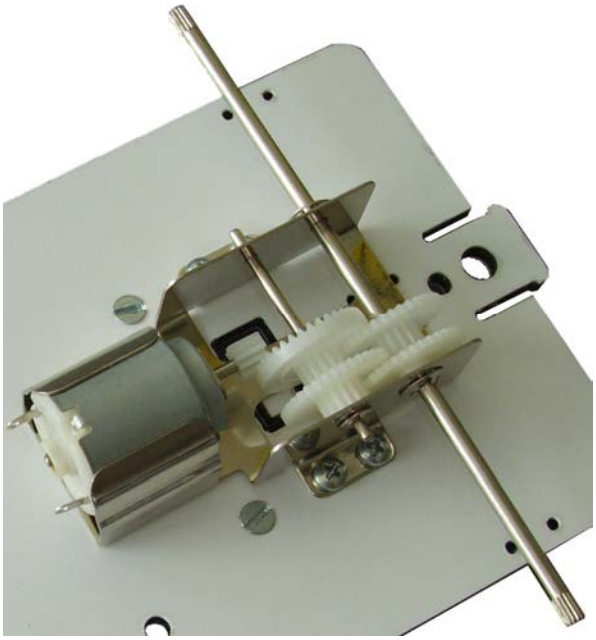
Mounting of the geared motor

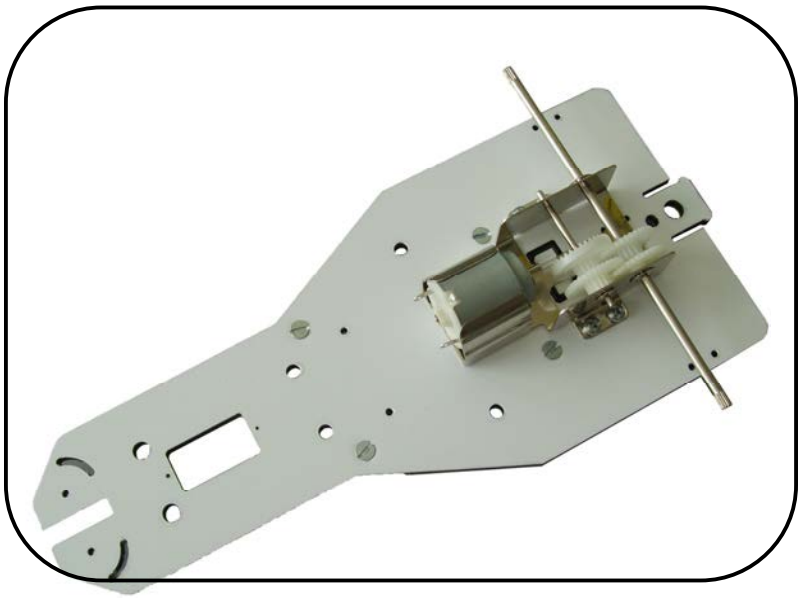
Parts required: Geared motor (M), 4 self-tapping screws 2.9 x 6.5mm, the base from the previous step.



Mount the geared motor (M) in the position marked on the base

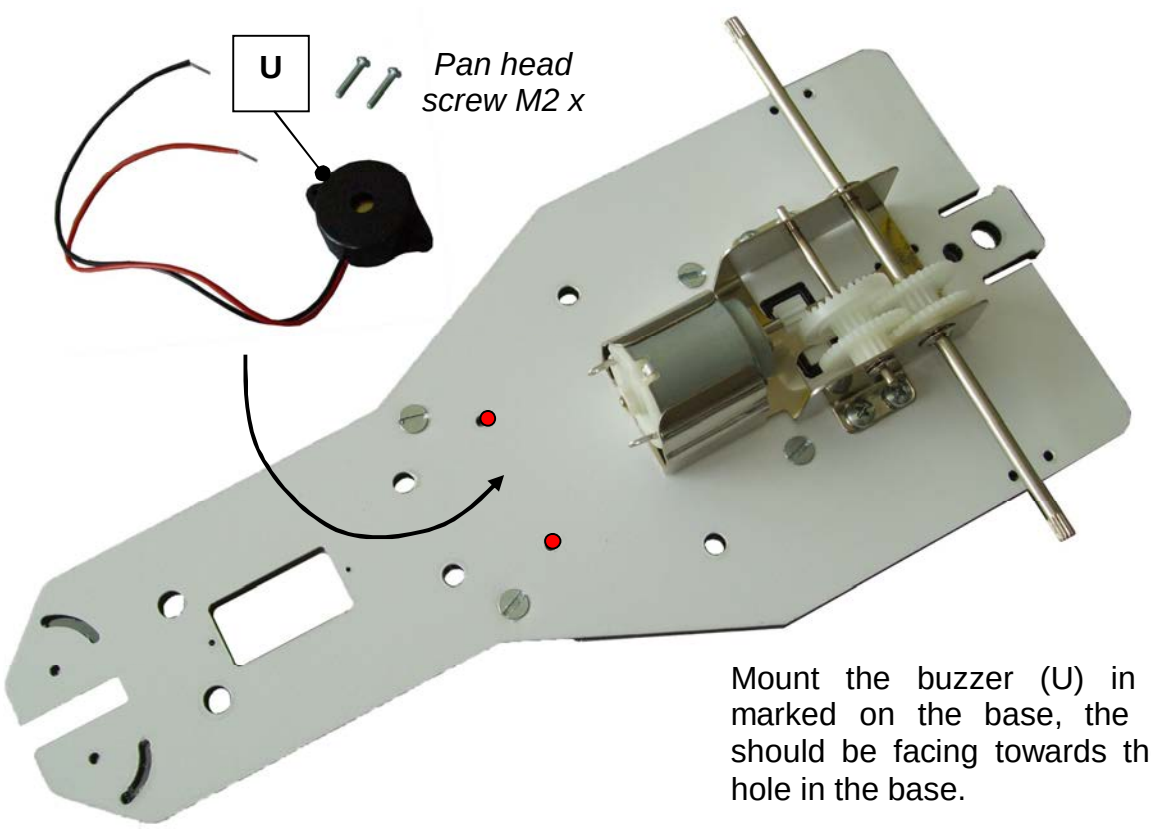
The geared motor must be mounted on the screw head side of the base





Mounting of the buzzer

Parts required: Buzzer (U), 2 pan head screws M2 x 10mm, the base from the previous step.

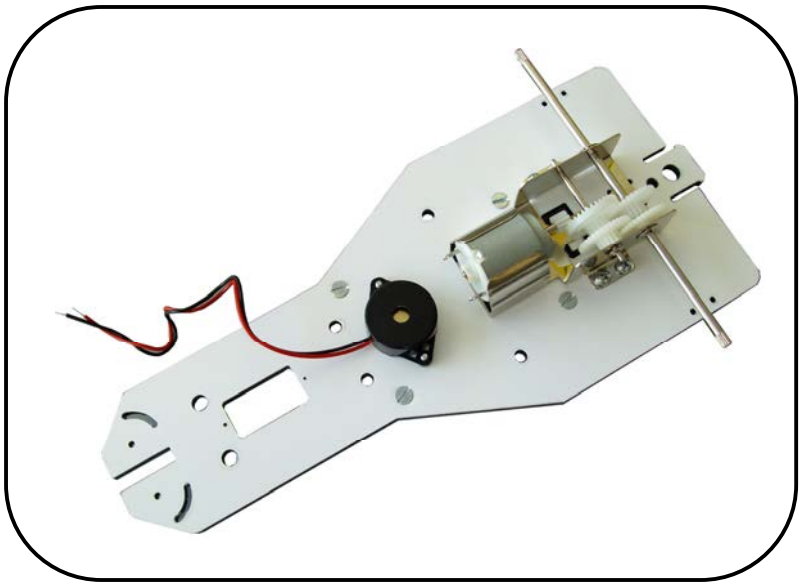


Mount the buzzer (U) in the position marked on the base, the buzzer wires should be facing towards the rectangular hole in the base.

The buzzer is mounted on the motor side of the base, the two pan head screws M2 x 10mm are inserted from the other side.

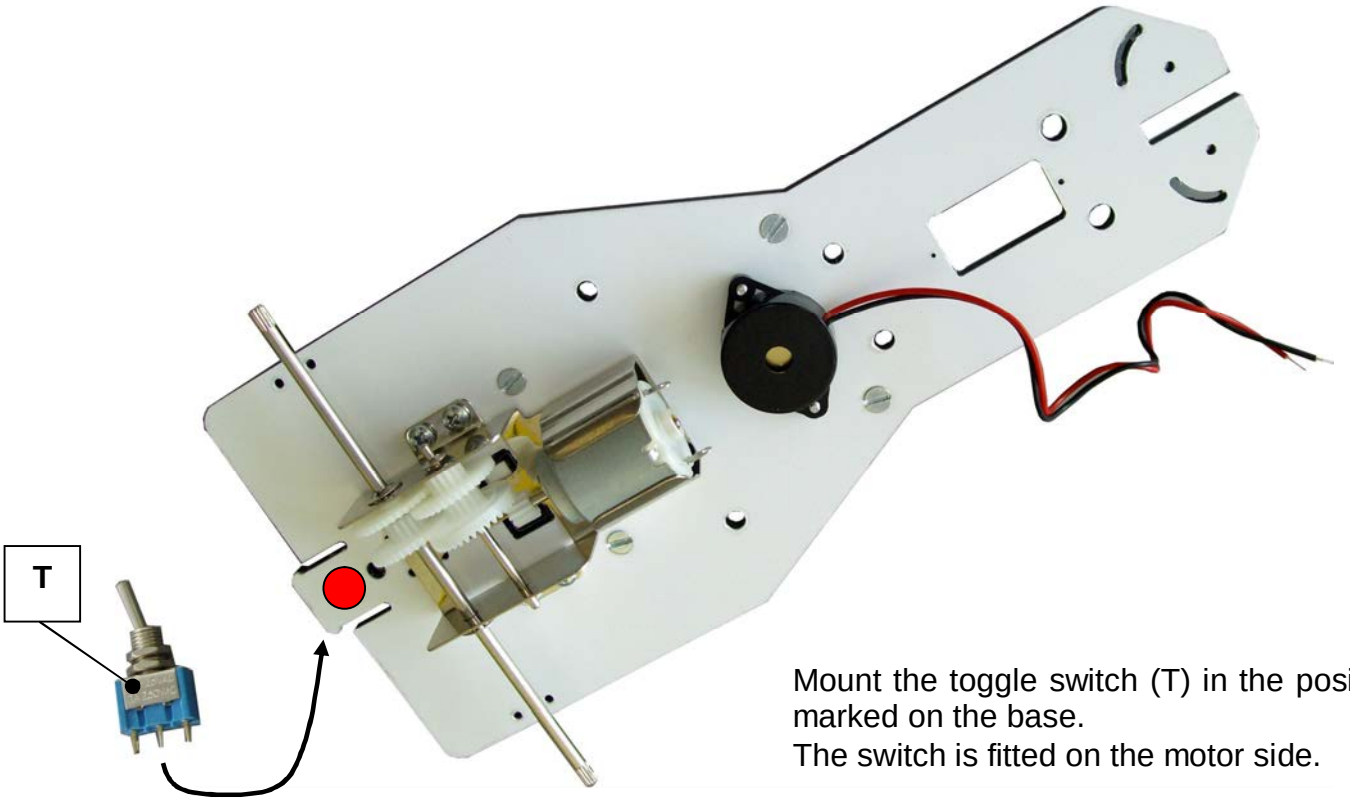
Tighten the two screws which thread through the two fastening lugs on the buzzer.

Depending on our supplies, the fastening lugs on the buzzer may have a larger diameter than the screws. In this case, put an M2 nut on the end of each screw.

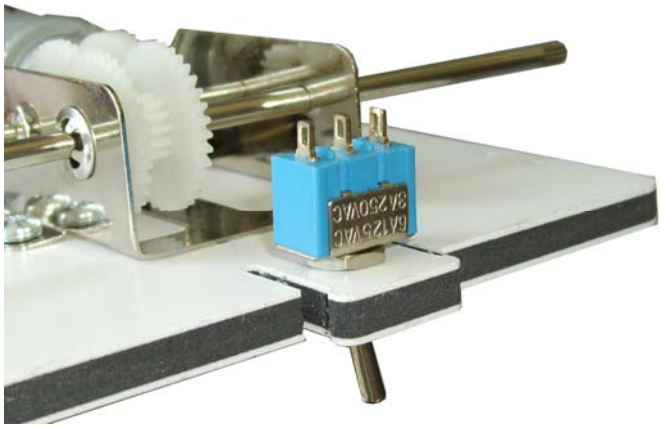


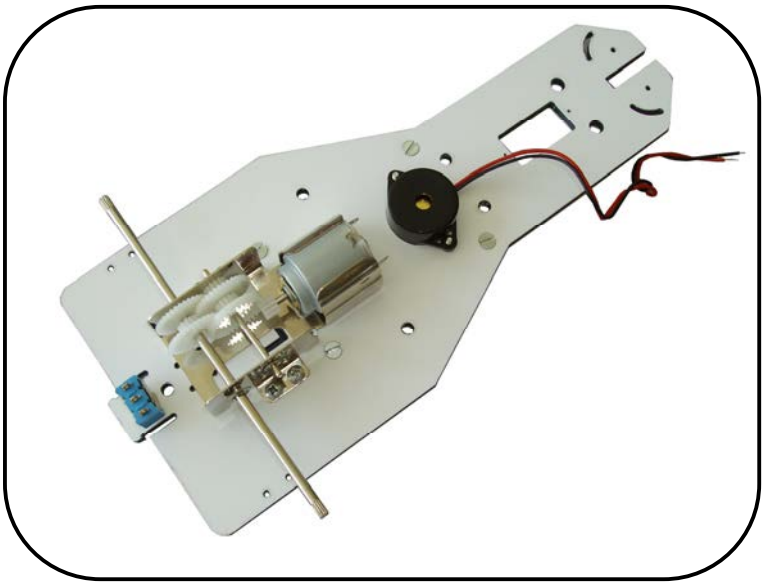
Mounting of the switch

Parts required: toggle switch (T), the base from the previous step.



Mount the toggle switch (T) in the position marked on the base.
The switch is fitted on the motor side.



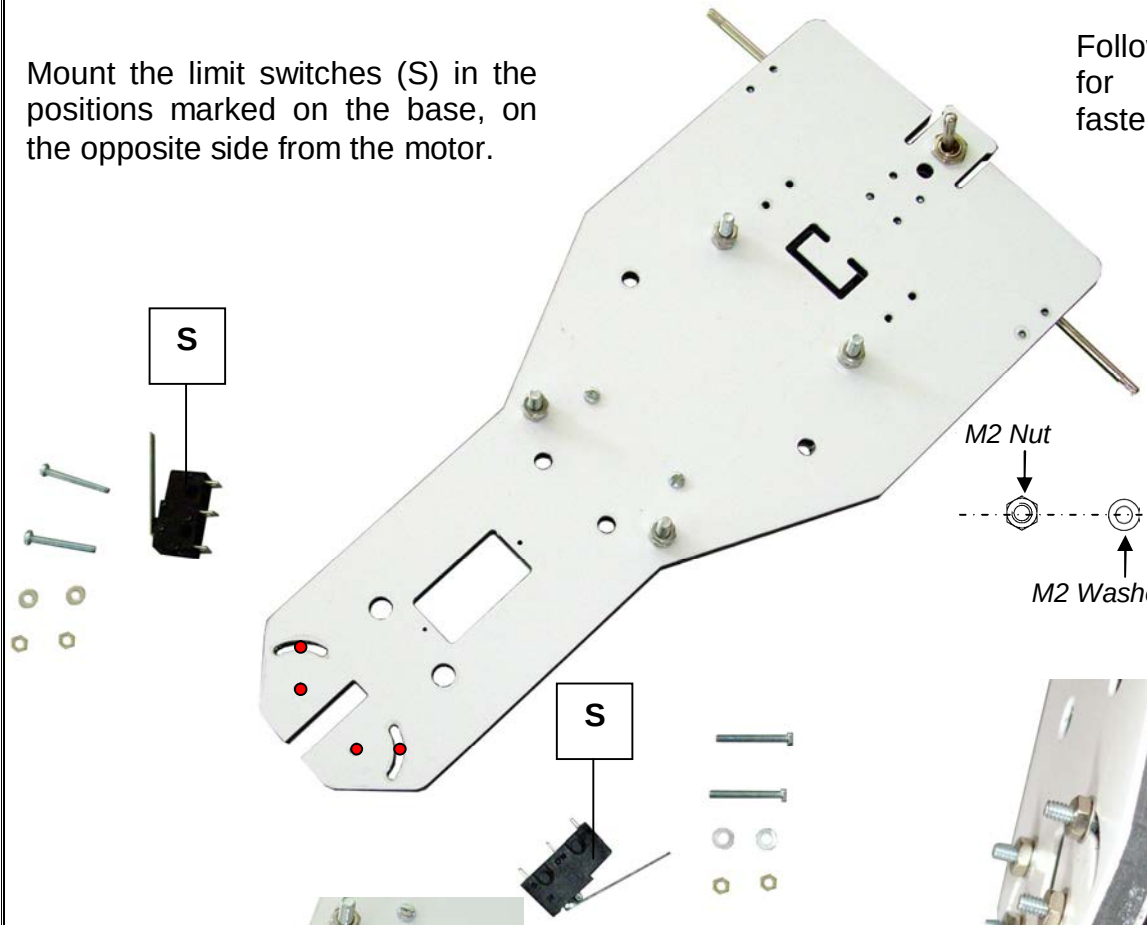


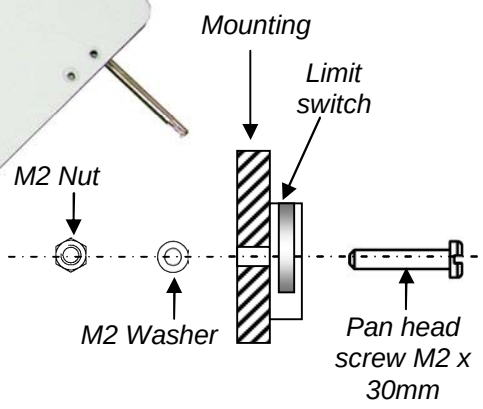
Mounting of the limit switches

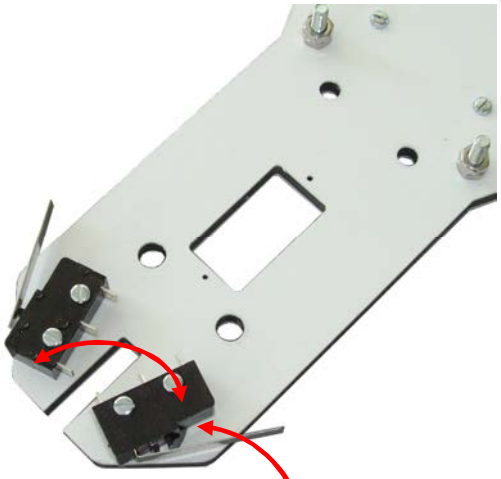
Parts required: 2 'moustache' limit switches (S), 4 pan head screws M2 x 16mm, 4 M2 nuts, 4 M2 plain washers, the base from the previous step.

Mount the limit switches (S) in the positions marked on the base, on the opposite side from the motor.

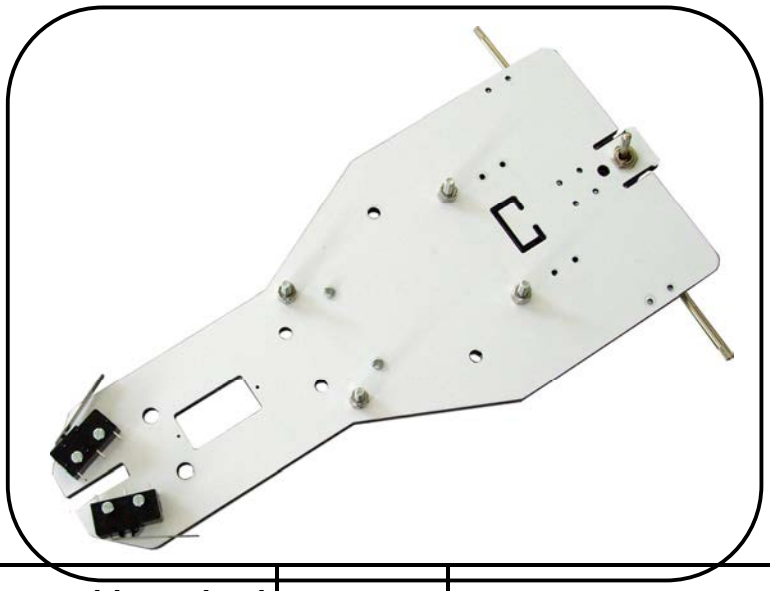
Follow the order shown for assembling the fastenings







The quarter-circle cut-out on the base allows you to adjust the angle of the limit switches at your own discretion.

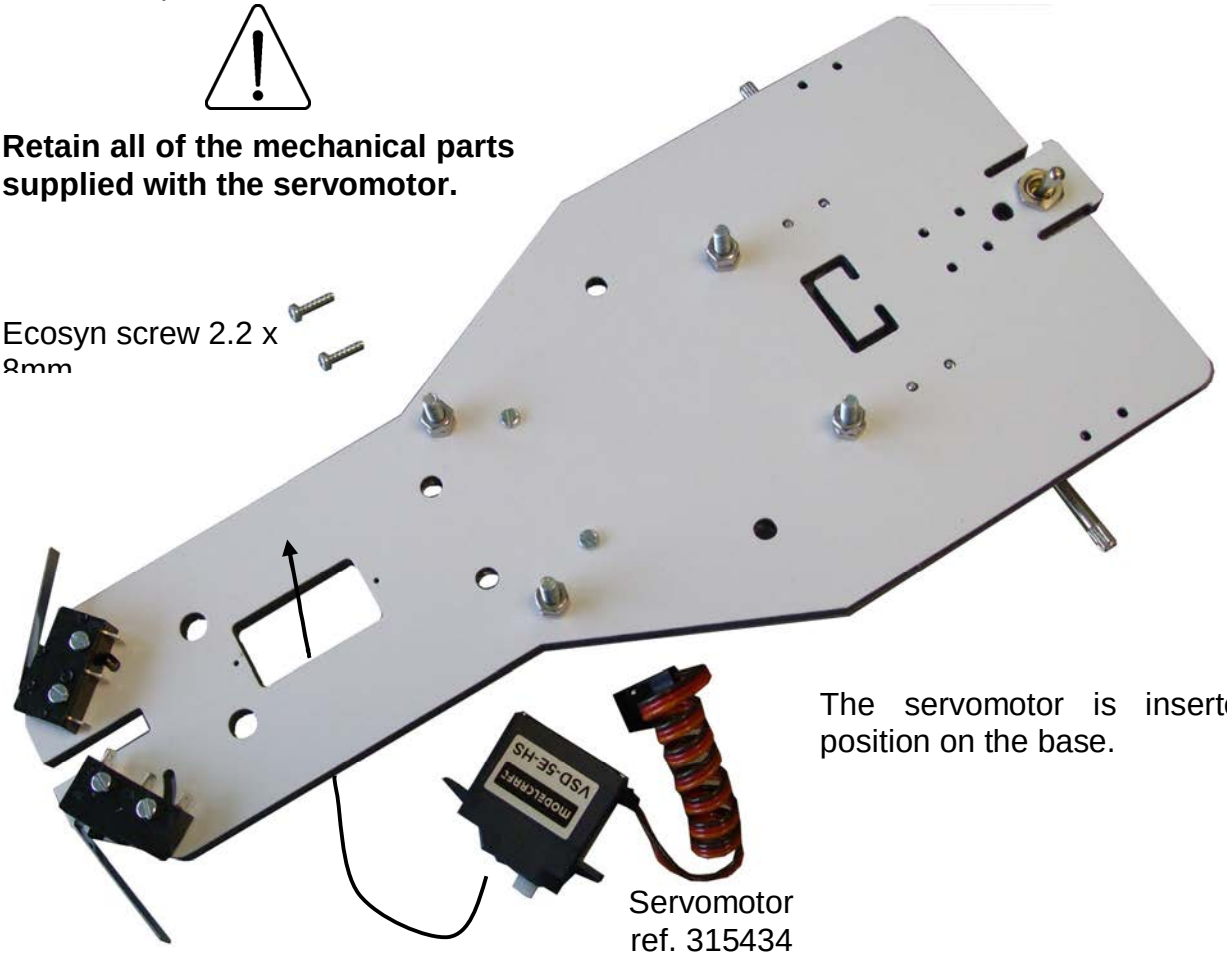


Mounting of the servomotor:

Parts required: Servomotor, ref. 315434, 2 self-tapping screws 2.2 x 8mm, the base from the previous step.

Retain all of the mechanical parts supplied with the servomotor.

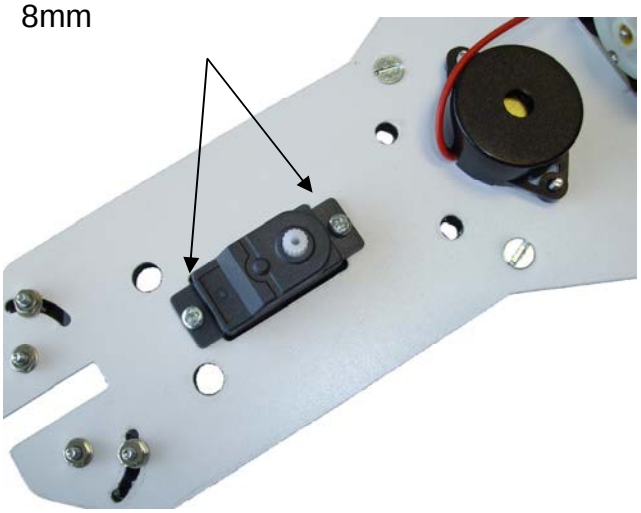
Ecosyn screw 2.2 x 8mm



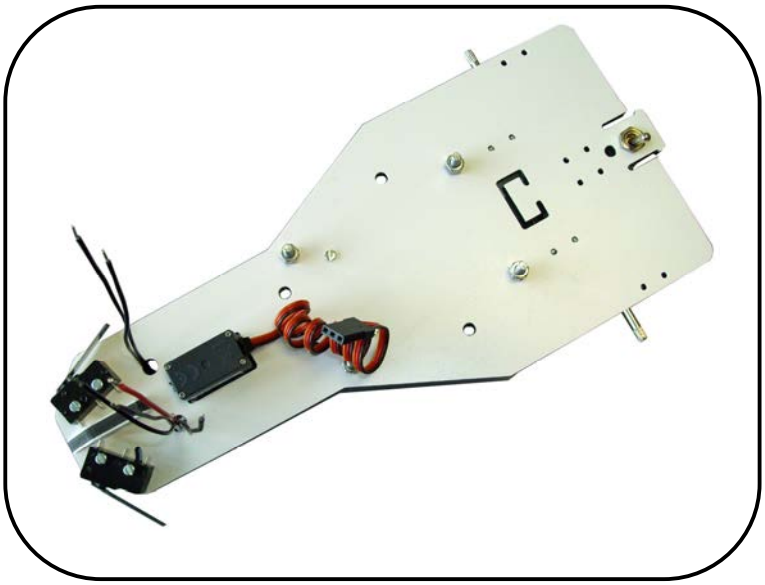
The servomotor is inserted into its position on the base.

Servomotor ref. 315434

Ecosyn screw 2.2 x 8mm

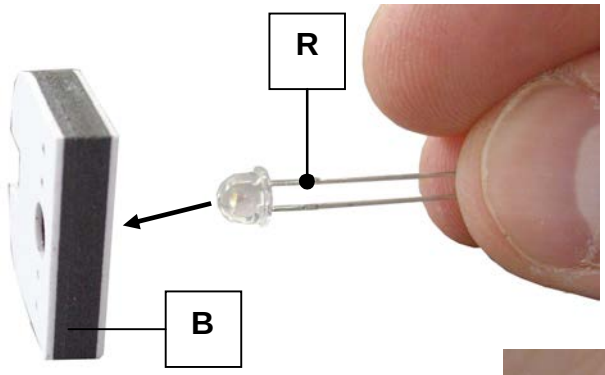


The spindle of the servomotor should be facing the buzzer.



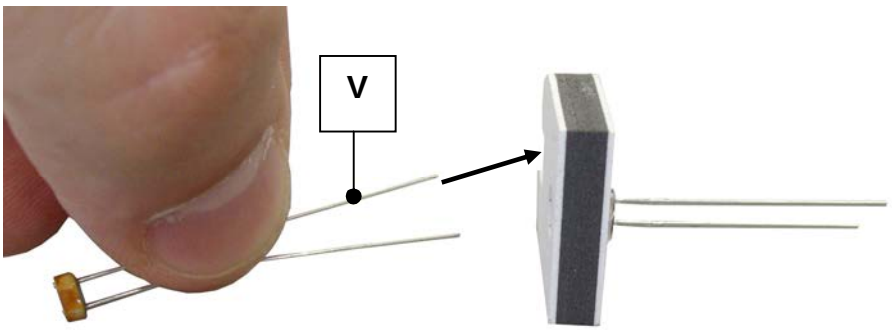
Mounting and wiring of the line tracer

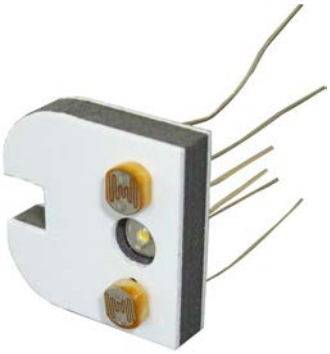
Parts required: Line tracer mounting (B), nosepiece (C), 2 LDRs (V), White LED (R), wires (K) and (L), the base from the previous step.



On the line tracer mounting (B), insert the white LED (R) into the largest hole.

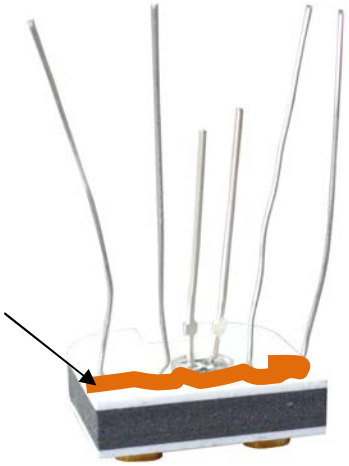
On the opposite side, insert the two LDRs (V).



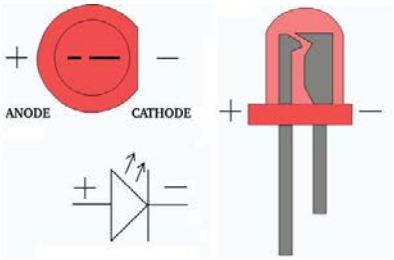


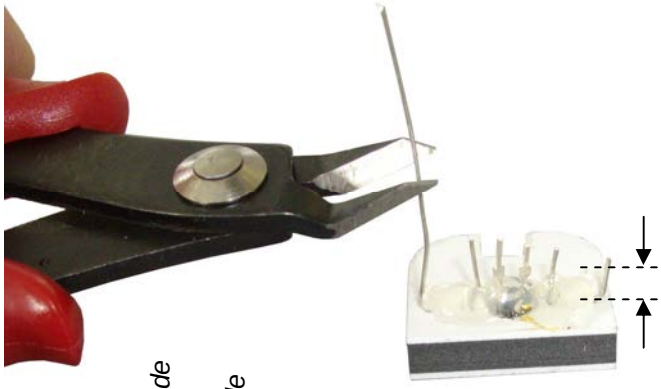
The two LDRs should be stuck onto the mounting.

In order to keep the 3 components in place, put a small amount of hot glue on the pins side of the components.

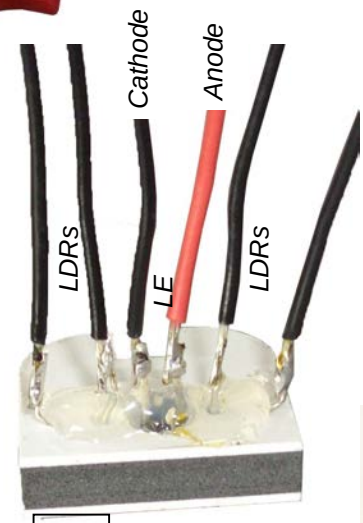


Before gluing, identify the anode and cathode of the white LED.





Trim the pins of the components 5mm above the level of the hot glue.

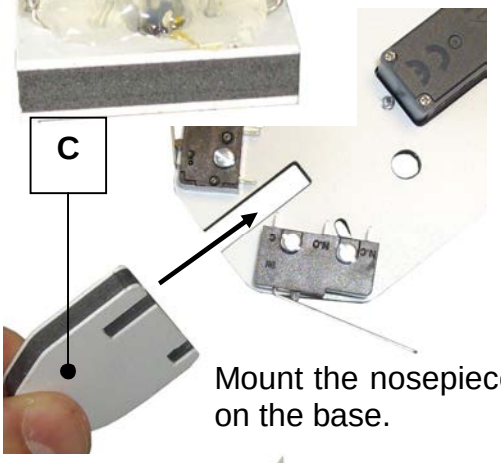


Cut 5 black wires, each 100mm long.

Cut 1 red wires, 100mm long.

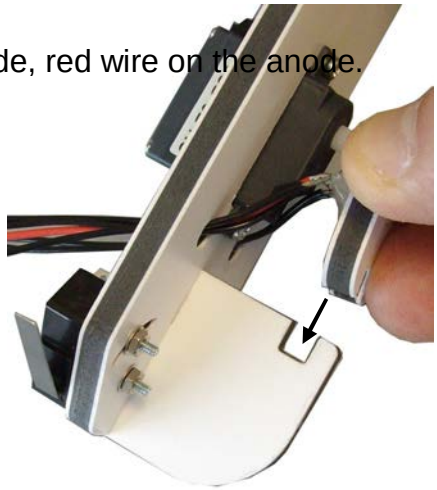
Strip and tin each end of the wires.

Solder the wires:
LDRs: black wires on each pin
White LED: Black wire on the cathode, red wire on the anode.

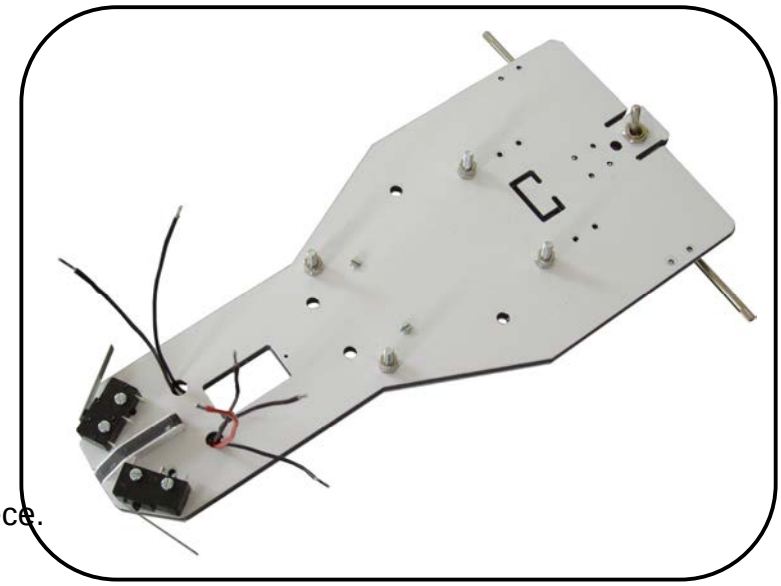


Mount the nosepiece (C) on the base.

Take the line tracer assembly and thread the wires through the holes as shown in the photo opposite.



Mount the line tracer on the nosepiece.



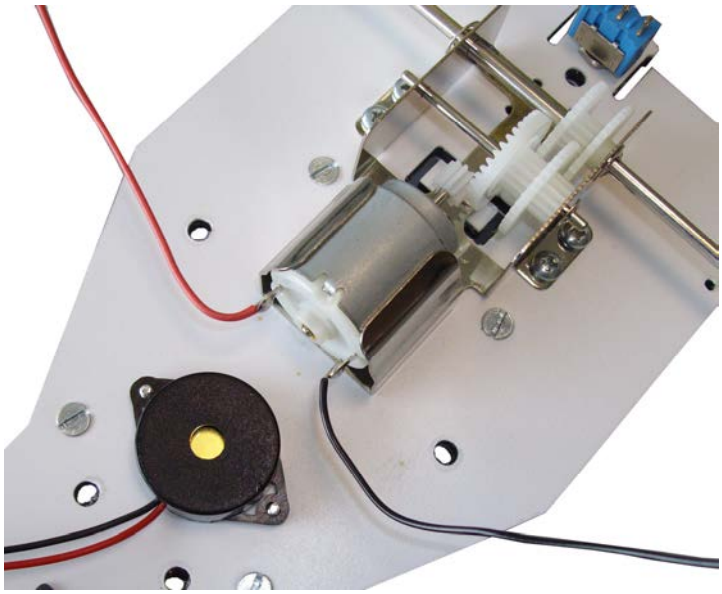
Wiring of the geared motor and limit switches:

Parts required: wires (K) and (L), the base from the previous step.

Cut 4 black wires, each 90mm long.

Strip and tin each end of the wires.

On each limit switch, solder the wires on the C (Common) and NO (Normally Open) terminals



Cut a 90mm long black wire.

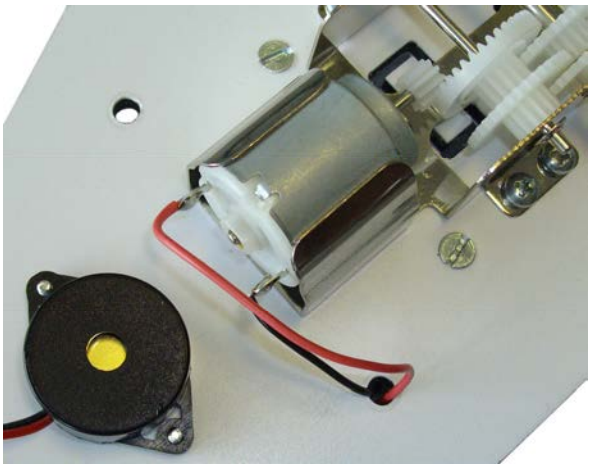
Cut a 90mm long red wire.

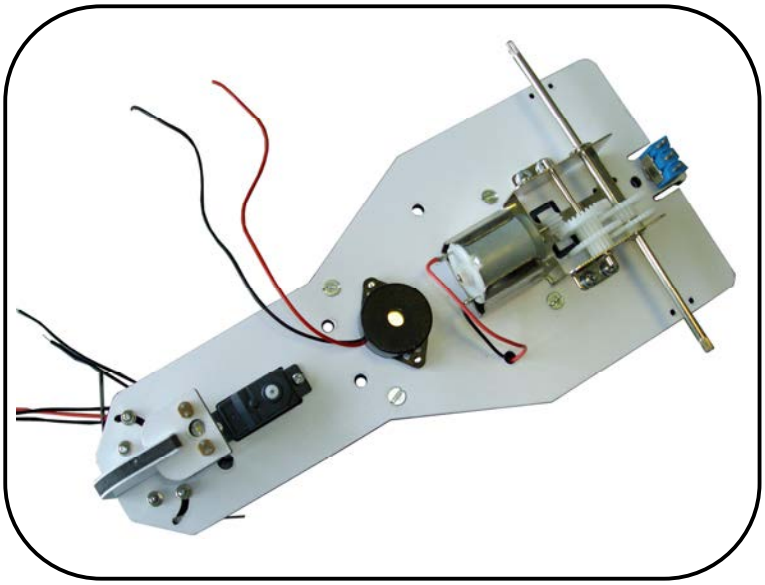
Then tin each end of the wires.

On the geared motor, solder the red wire onto the terminal marked with a either circle and a + sign or just a circle.

Solder the black wire to the other terminal.

⊗ or ○



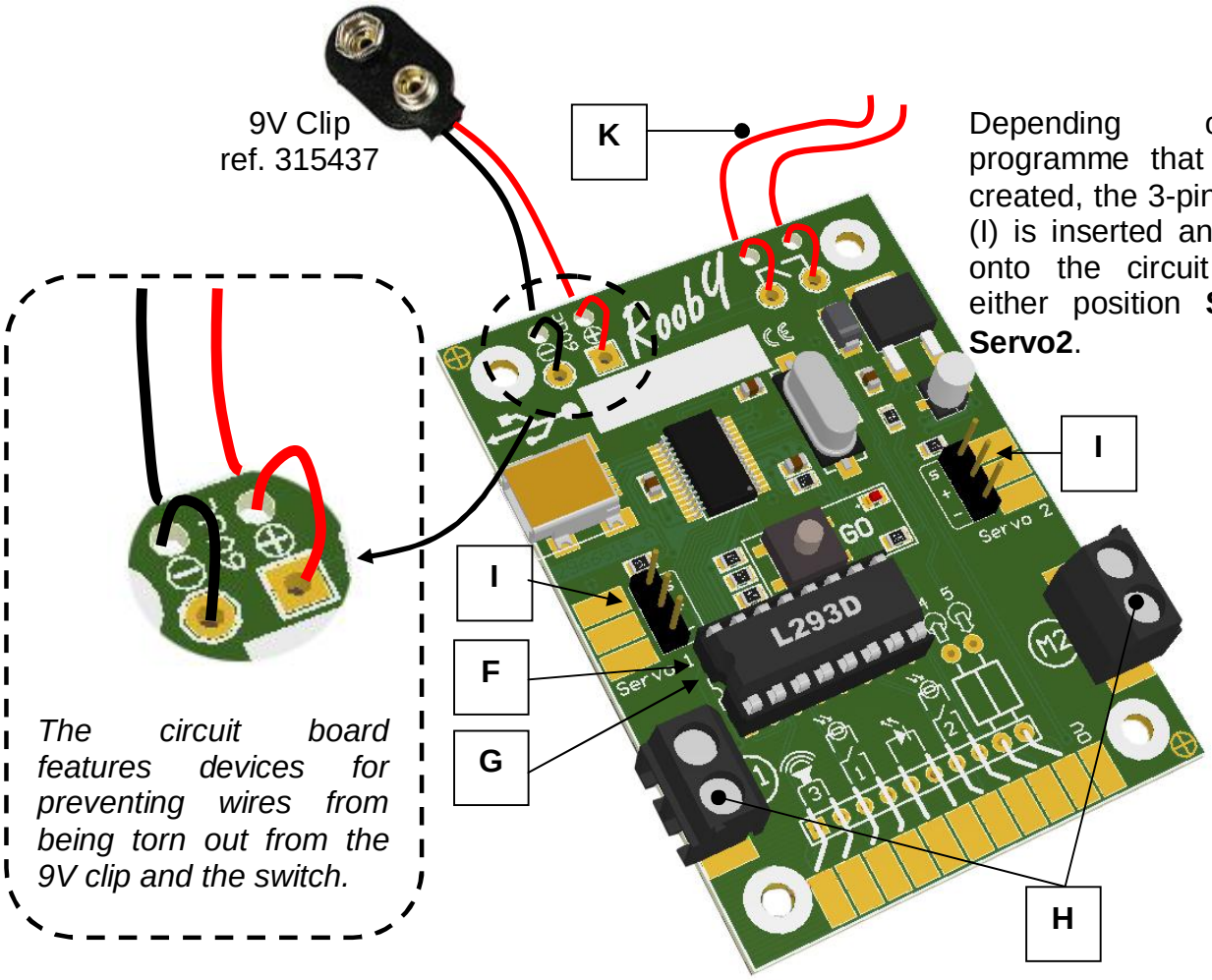


Thread the wires through one of the two holes located on each side of the geared motor.

Wiring of the Rooby circuit board:

Parts required: Rooby circuit board, ref. 181301, the 9V clip, ref. 315437, the integrated circuit mount (F), the 4-channel motor driver (G), the screw terminal (H), 1 3-pin connector (I), the red wires (K)

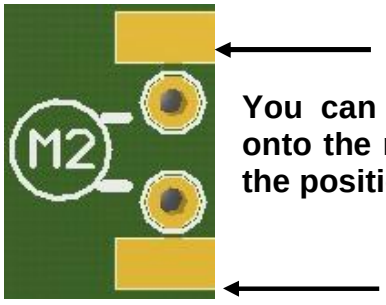
Cut 2 red wires (K), each 110mm long.
Strip and tin each end of the wires.
Solder them to the switch positions shown below.



The circuit board features devices for preventing wires from being torn out from the 9V clip and the switch.

Depending on the programme that you have created, the 3-pin connector (I) is inserted and soldered onto the circuit board in either position **Servo1 or Servo2**.

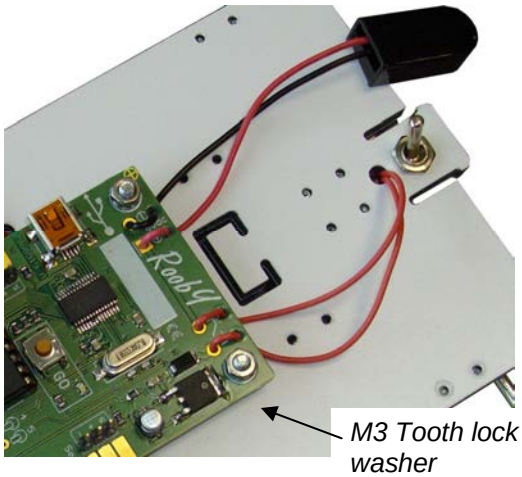
Depending on the programme that you have created, the screw terminal (H) is inserted and soldered onto the circuit board in either position **M1 or M2**.

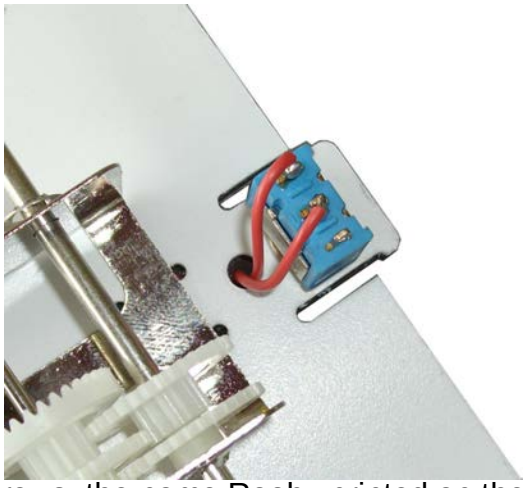


You can solder the geared motor wires directly onto the rectangular pads shown on either side of the position for the 2-pin terminal.

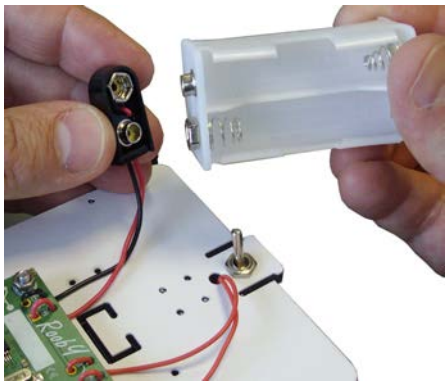
Mounting the Rooby circuit board and connecting the power supply component

Parts required: the Rooby circuit board from the previous step, 4 M3 tooth lock washers, 4 M3 nuts, the 4 AA battery holder, ref. 315449, 1 elastic band.

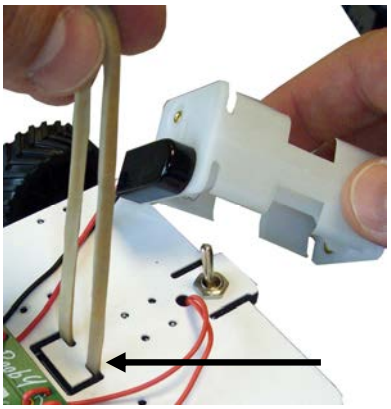




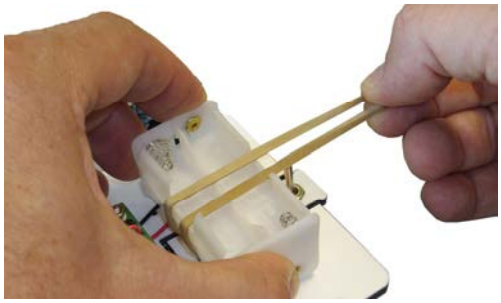
- Position the Rooby circuit board on the 4 supporting screws, the name Rooby printed on the circuit board should be pointing towards the switch.
- Put an M3 tooth lock washer and an M3 nut on each screw.
- Thread the red wires (connected to the circuit board at the switch symbol) through the hole in front of the switch.
- Turn the mounting around and then connect the two red wires onto the switch's terminals.



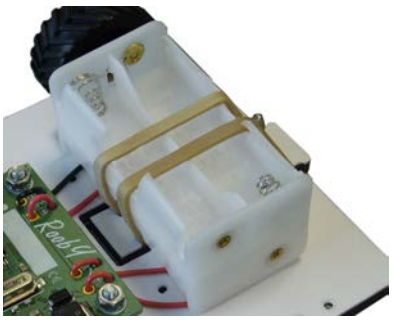
Connect the 9V clip to the battery holder.



Thread the elastic band through the opening shown in the above photo.

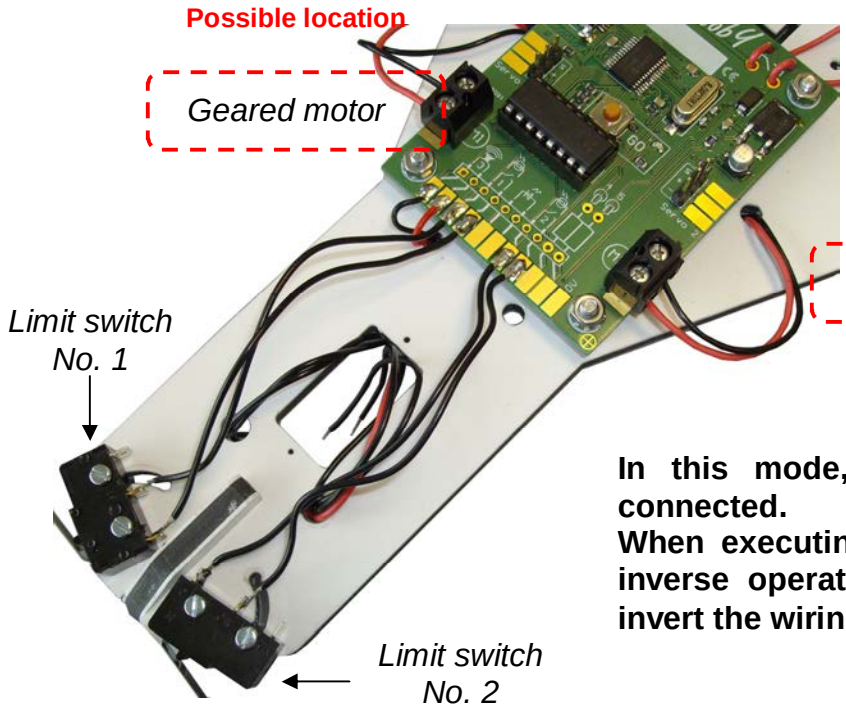


Pull the elastic band and pass it under the switch.



The battery holder is held onto your assembly.

Connecting the obstacle detection, buzzer and geared motor:

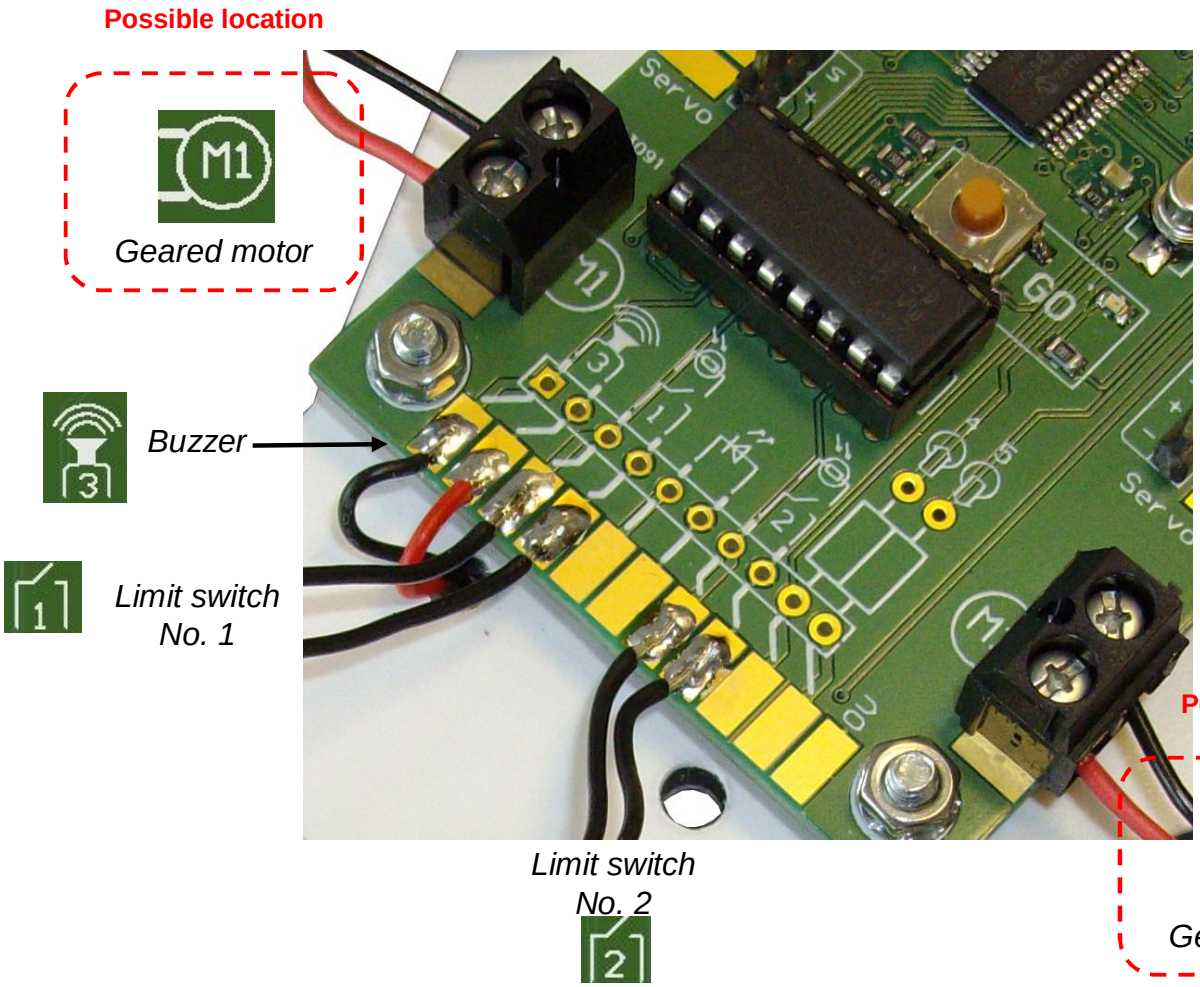


Make the connections as shown opposite

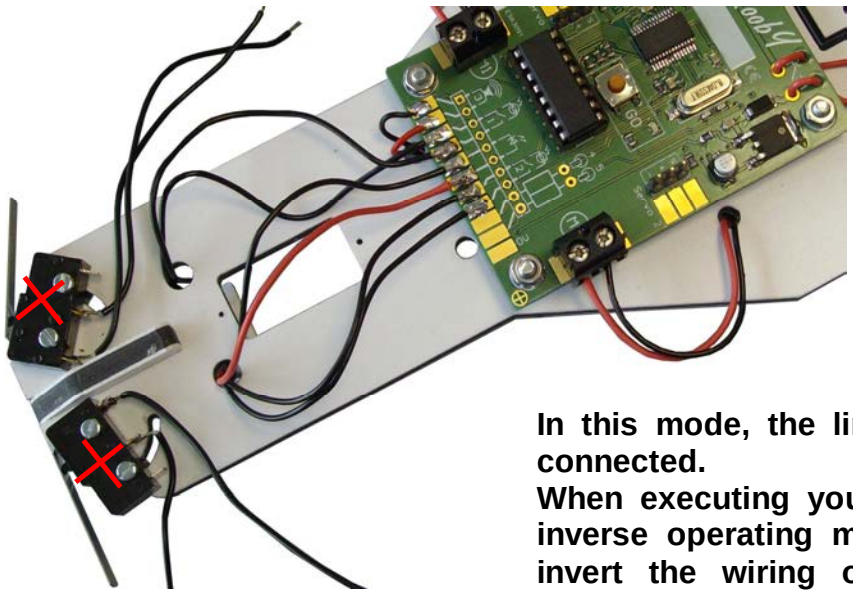
Possible location

Geared motor

In this mode, the line tracer is not to be connected.
When executing your program, if you note an inverse operating mode on the geared motor, invert the wiring on the 2-point terminal.

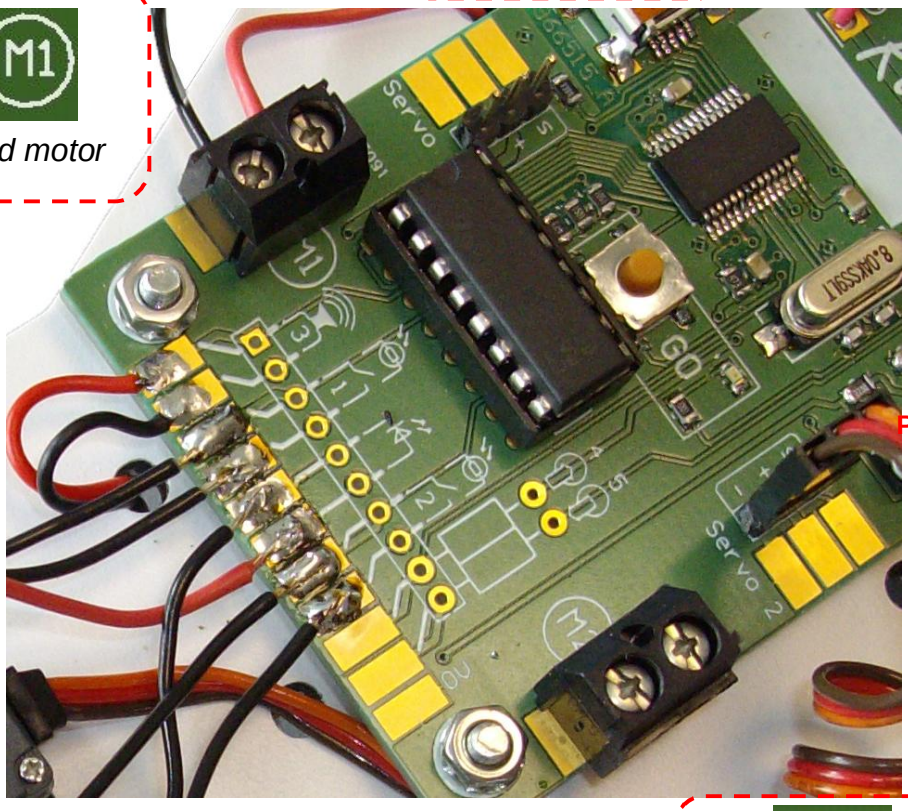


Connecting the line tracer, buzzer and geared motor:



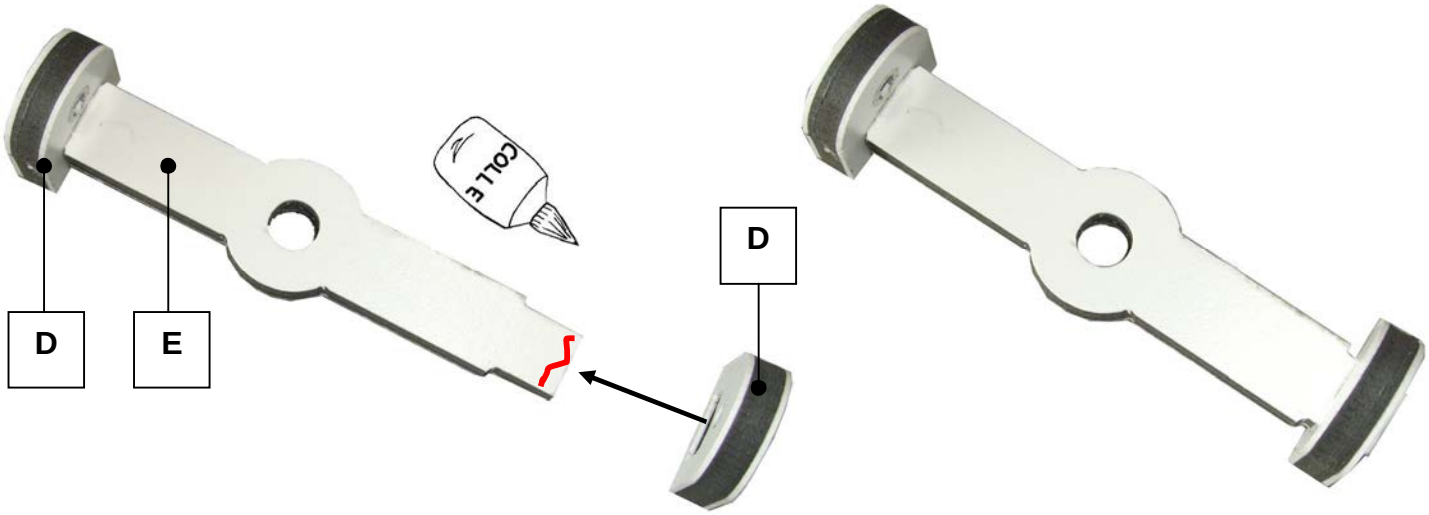
Make the connections as shown opposite

In this mode, the limit switches are not to be connected.
When executing your program, if you note an inverse operating mode on the geared motor, invert the wiring on the M1 or M2 2-point terminal where you made the connection.



Mounting the front wheels on the axle:

Parts required: 2 front wheels, ref. 315495, 2 wheel mountings (D), the front axle (E), 2 pan head screws M4 x 30mm.



Push the wheel mountings (D) onto each end of the front axle (E): the holes on the wheel mountings should be facing the same side.

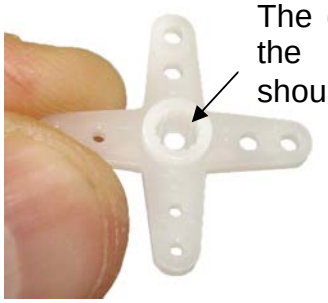
To secure the assembly, we recommend that you use a drop of Cyanolit Super Safe gel glue (3g).

Using the 2 pan head screws M4 x 30mm, attach the wheels to each wheel mounting: by fully tightening the two screws, they tap into the mountings (D).

So that each wheel can rotate freely, ensure that the screws are not over-tightened.

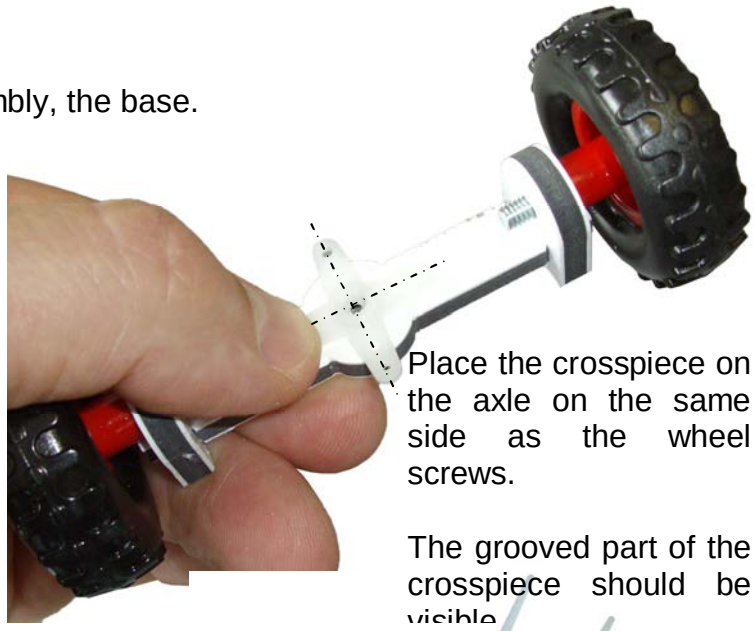
Mounting of the front axle:

Parts required: 2 cable ties, the previous assembly, the base.



The grooved part of the crosspiece should be visible

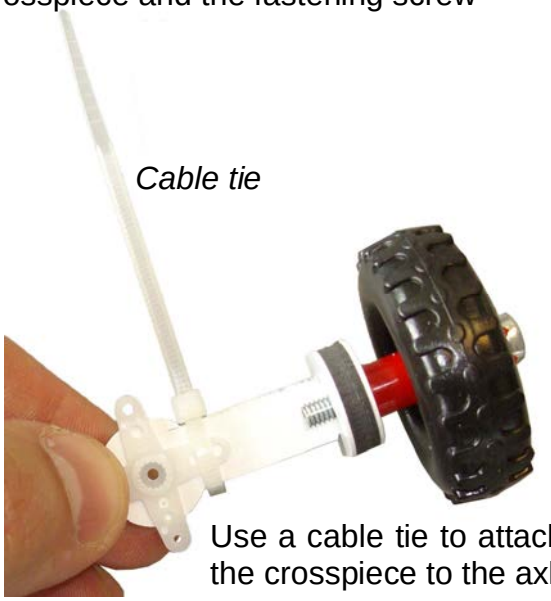
From the mechanical parts supplied, take the crosspiece and the fastening screw



Place the crosspiece on the axle on the same side as the wheel screws.

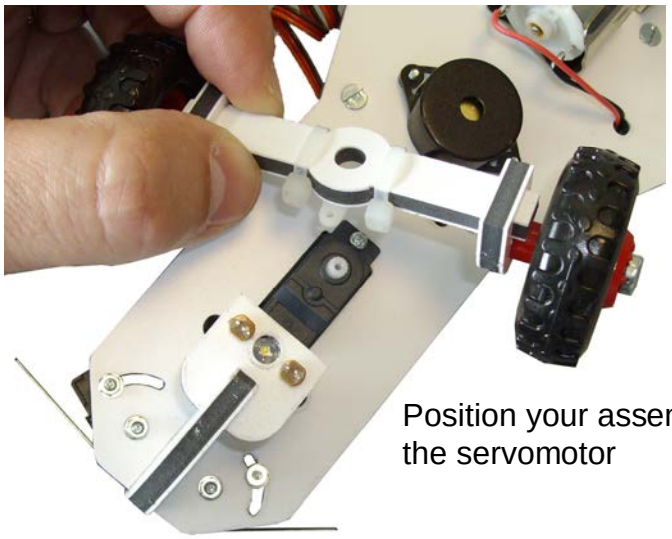
The grooved part of the crosspiece should be visible

Cable tie



Use a cable tie to attach one arm of the crosspiece to the axle

Do the same for the second branch and then cut off the excess cable tie using cutting pliers.



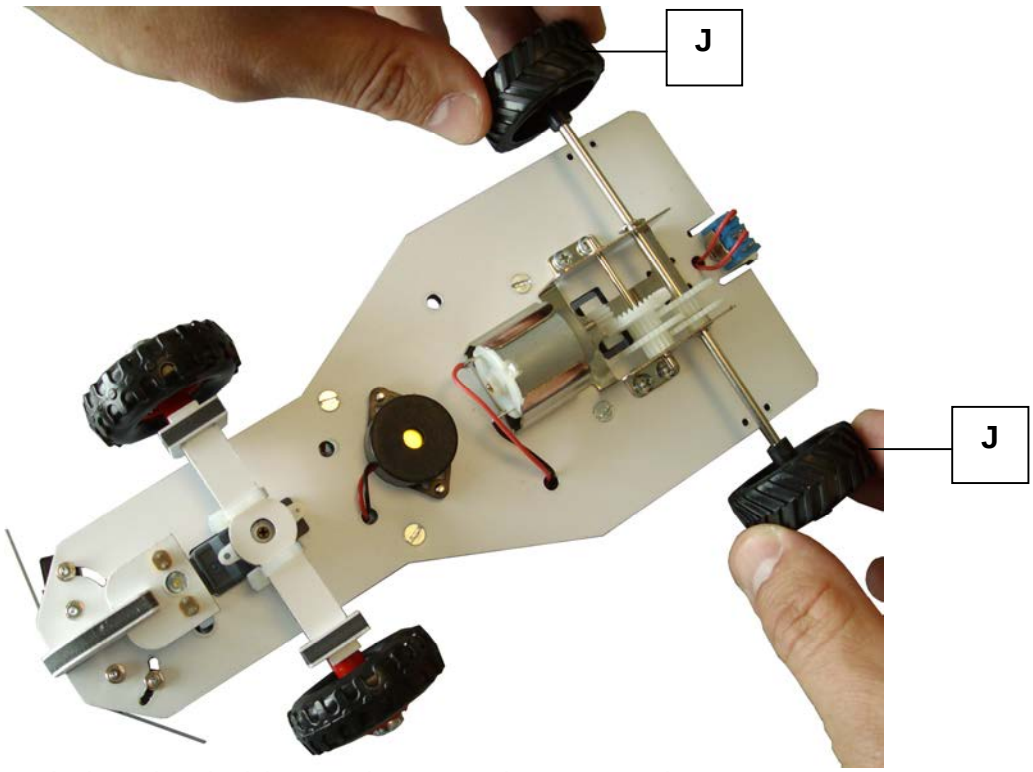
Position your assembly on the servomotor

It is possible that you may have to adjust the front axle according to the operation of the servomotor

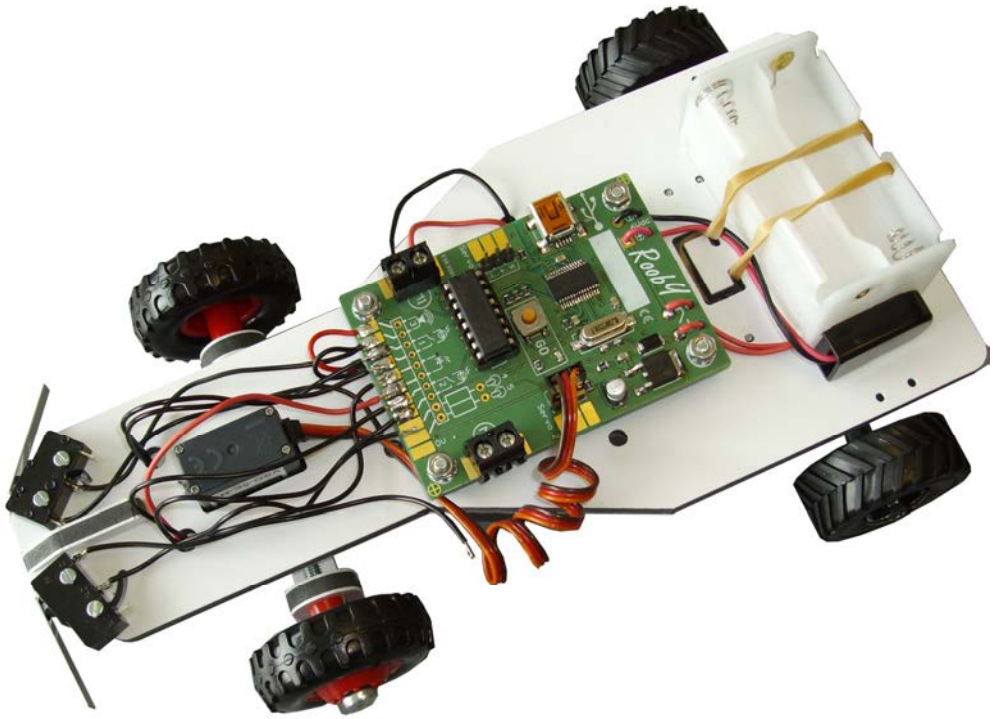
Tighten the screw which was supplied with the servomotor through the axle

Mounting the rear wheels:

Parts required: The previous assembly, 2 wheels (J).



Push the wheels (J) onto the geared motor's axle.



Your assembly is ready to be programmed