OPITEC

115855

Bi-Power-Speedy with Wired Remote Control

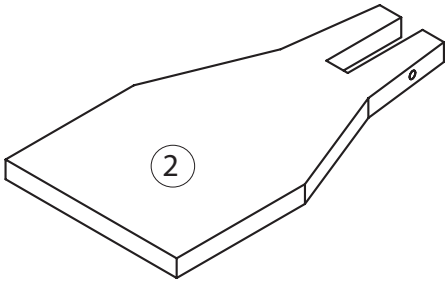
Required Tools:
sand paper
fine saw or scroll saw
scissor, ruler, pencil
drill ø2.5, ø4, ø 7, ø10mm
wood glue and all purpose adhesive
modeling knife
soldering iron, solder flux

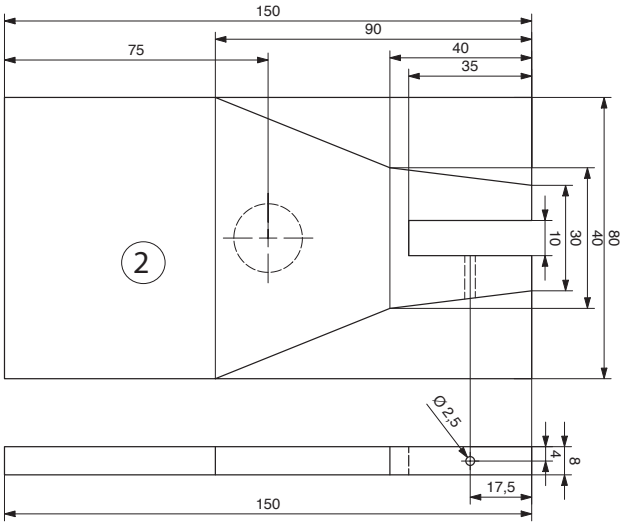
Please Note
The OPITEC range of projects is not intended as play toys for young children. They are teaching aids for young people learning the skills of craft, design and technology. These projects should only be undertaken and operated with the guidance of a fully qualified adult. The finished projects are not suitable to give to children under 3 years old. Some parts can be swallowed. Danger of suffocation!

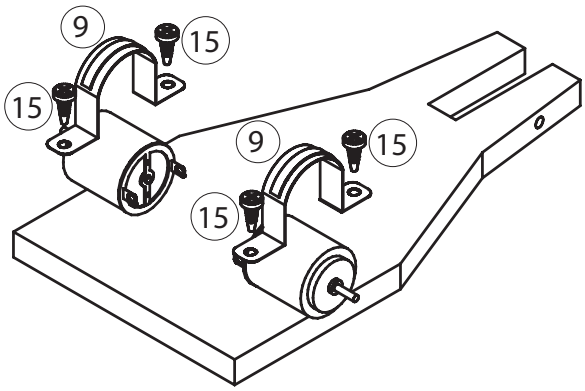
Contents list				
	Qty	**Dimensions(mm)**	**Designation**	**Part no.**
Plywood	1	200x100x5	Construction control	1
Plywood	1	200x80x8	Construction vehicle	2
Grey Cardboard	1	210x150x1	Construction vehicle	3
Hard Paper Pipe	1	ø 19,5x300	Exhaust	4
Wooden Wheel	1	ø 30	Wheel Rear Axle	5
Impeller	2	ø 45	Wheel Front Axle	6
Wooden Strip	1	350x25x10	Composition Controling	7
Motor	2		Drive	8
Bow	2	21	Attachment Motor	9
Brass Case	1	ø4 x 8	Axle-Box Back Wheel	10
Reducer	2	3/2	Reduction Motor Shaft	11
Push Button	2		Control	12
Slide Switch	1	36x13, 6-polig	Switch	13
Tapping Screw	1	2,9x25	Rear Axle	14
Tapping Screw	8	2,9x9,5	Screwing	15
Blade Receptacle	2		Battery Connector	16
Washer	6	7/3,2	Washer	17
Cable red	2	2000	Cabling	18
Cable black	2	2000	Cabling	19

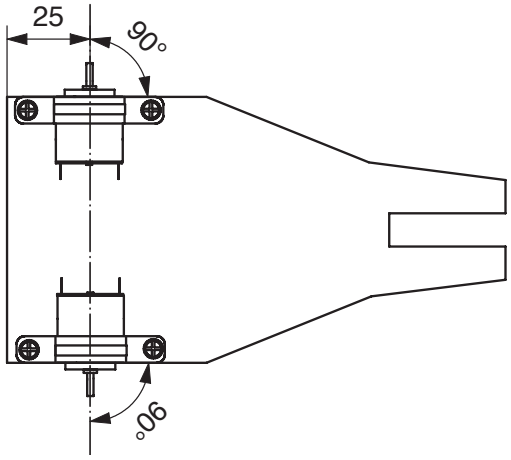
Instructions to build the vehicle:

1. Transfer the template of the base (page 7) on the plywood and saw it with the fretsaw. Clean and sand the sawed edges.
   Drill a ø2,5 mm drilling in the side edge. See picture!

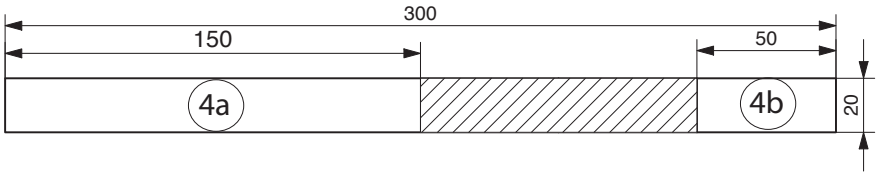


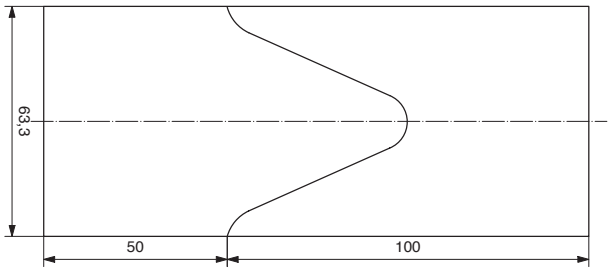


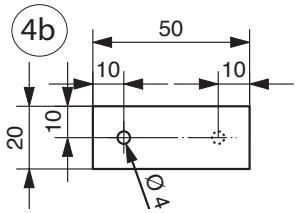


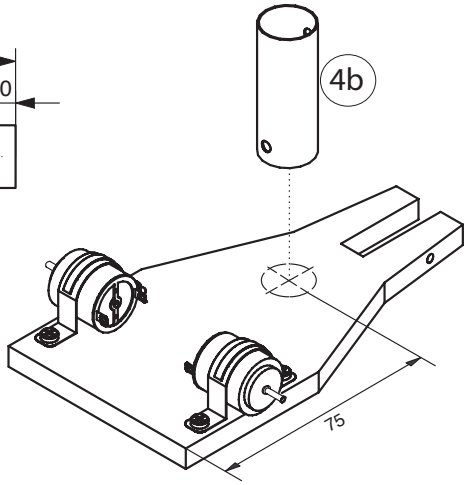


3. Fix each motor with a bow (9) and two screws (15) on the base as shown.
   Hint: Direct your attention on the position of the motors. They must be fixed right angeled to the base and must be in a line with each other.



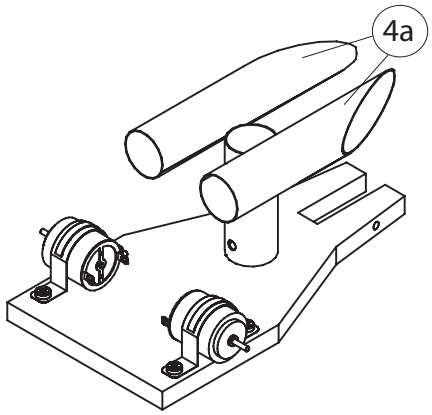




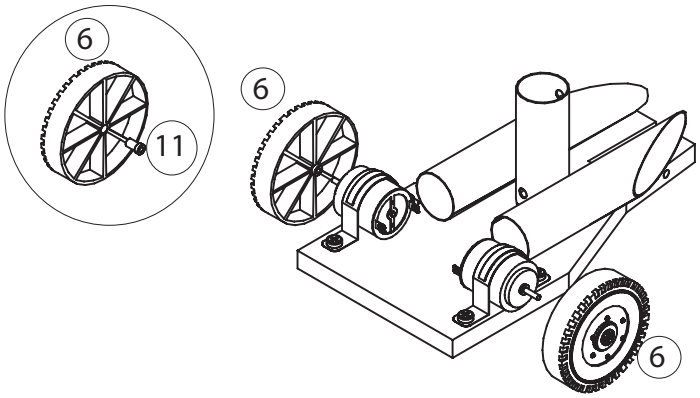


4. Measure and mark 150mm (4a) on the hard paper pipe (4) from one end and 50mm from the other end (4b). Cut the hard paper pipe along the marked lines with the jigsaw. Cut the template for the pipe (page 7) Lay it round the hard paper piece and fix it with tape.
   Cut the 150mm long piece, along the line of the taped template, into two bevelled parts with the jigsaw.
   Take the 50mm piece (4b) and drill a ø4mm hole in one side, turn the pipe piece and drill a ø4mm hole again. The second hole is on the other end on the opposite side.

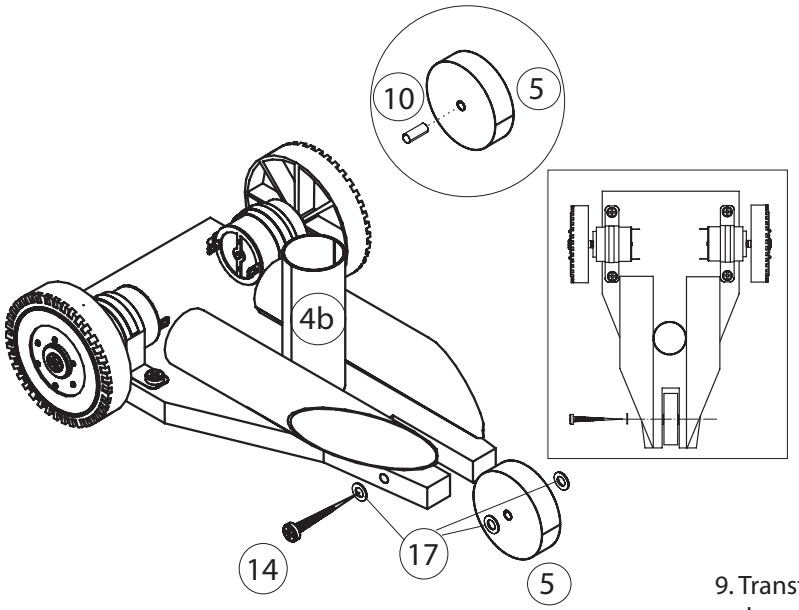
5. Glue the 50 mm hard paper pipe (4b) centered on the base as shown. Direct your attention on the drilling in the pipe. It must be straightened to the motor.



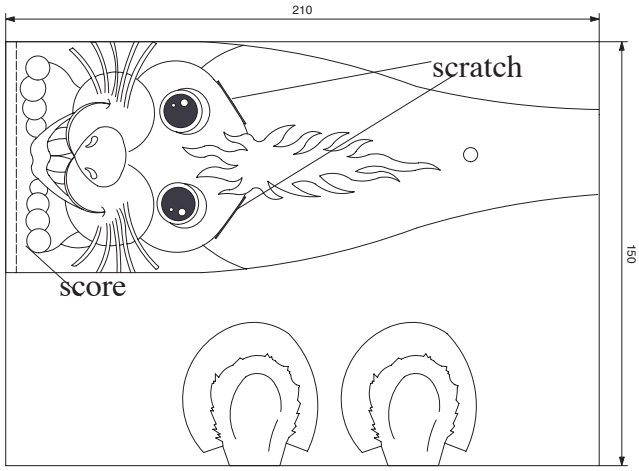
6. Fix the bevelled pipe pieces (4a), left and right of the 50mm pipe, on the base as shown.



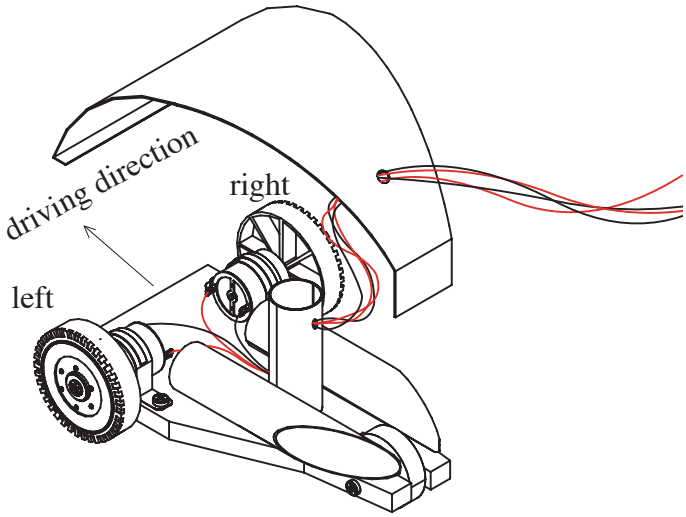
7. Insert a reducer (11) in the drilling hole of the wheels (6). In addition put each wheel on a motor axis.

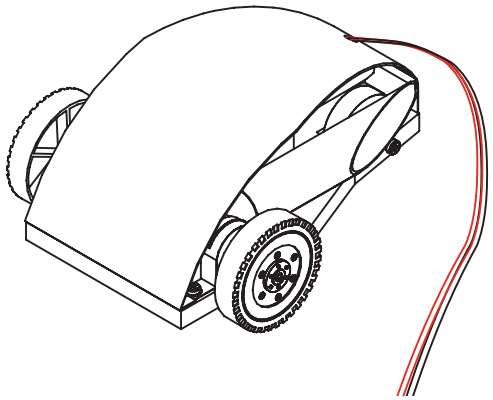


8. Put the brass sleeve (10) into the wooden wheel (5). Moreover fix the wooden wheel with a screw (14) and 3 flat washers (17) in the middle of the back axis.



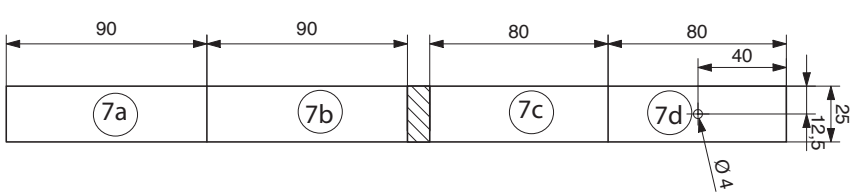
9. Transfer the composition (mouse motive) and the ears on the grey cardboard and cut it out (template page 9). Cut the slots (broken line) for the ears with a craft knife. Add the hole for the cable route with a ticket punch, a knife or a scissor for example.
Hint: Coloure the composition and the base plate before assembling.

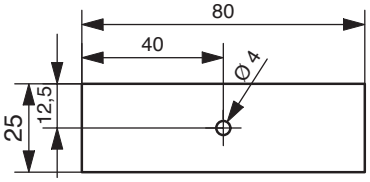


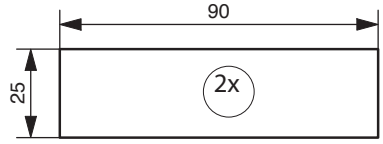


10. Cut a approx. 200mm long piece of the red and black cable. (18 + 19) Re isolate and tin both sides of all 4 cable parts. Connect one end of the black long wire with the plus terminal (marked with depression) of the left engine. Take the second black cable and connect it with the minus terminal of the right engine. Connect the remaining red cables to the free engine connection (1 each side). Lead all the 4 cables through the under drilling into the 50mm hard paper pipe and pull them out again through the upper hole.
Moreover thread the cables through the composition, as shown. Push the cardboard under the bow, which fixes the motor. Do not glue the building at the back yet.

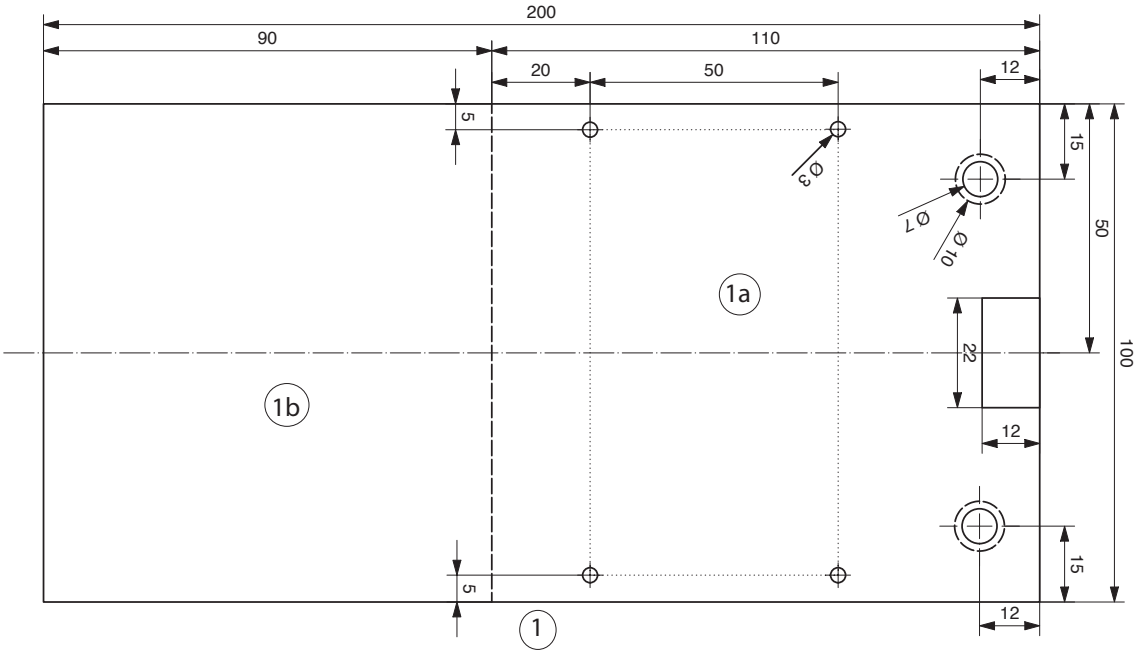
Instructions to build the control:



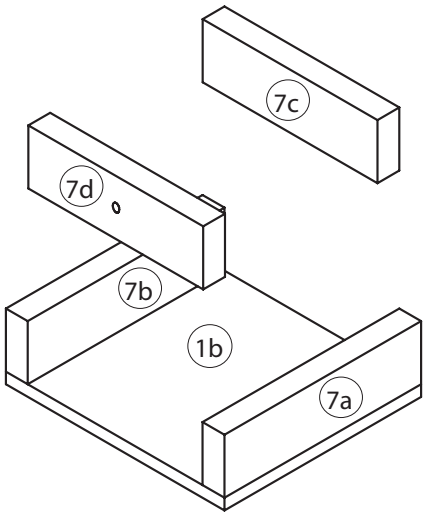




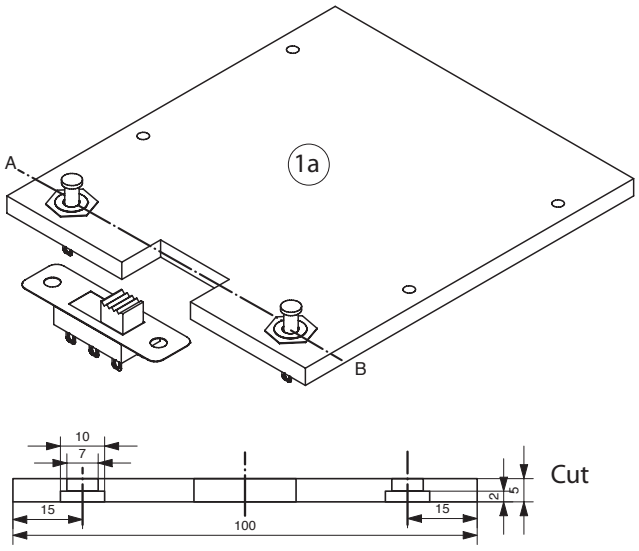
11. Cut the wooden strip (7) as shown. Mark the center of a 80mm strip and drill a hole ø 4mm into it.



12. Cut the plywood (1) as shown in two parts with 90mm and 110mm. Take the piece which is 110mm long and saw the opening for the slide switch.
Next drill two drill holes, ø2,5mm, for the push buttons next to the opening. Additionally turn around the plate and drill a 2mm deep hole with a diameter of 10mm directly over the ø2,5mm drill hole. After that turn around the plate again and drill one more hole with ø7mm over the existing ø2,5mm drilling hole on each side. For future mounting drill 4 holes ø 3mm into the base, as shown (1a).



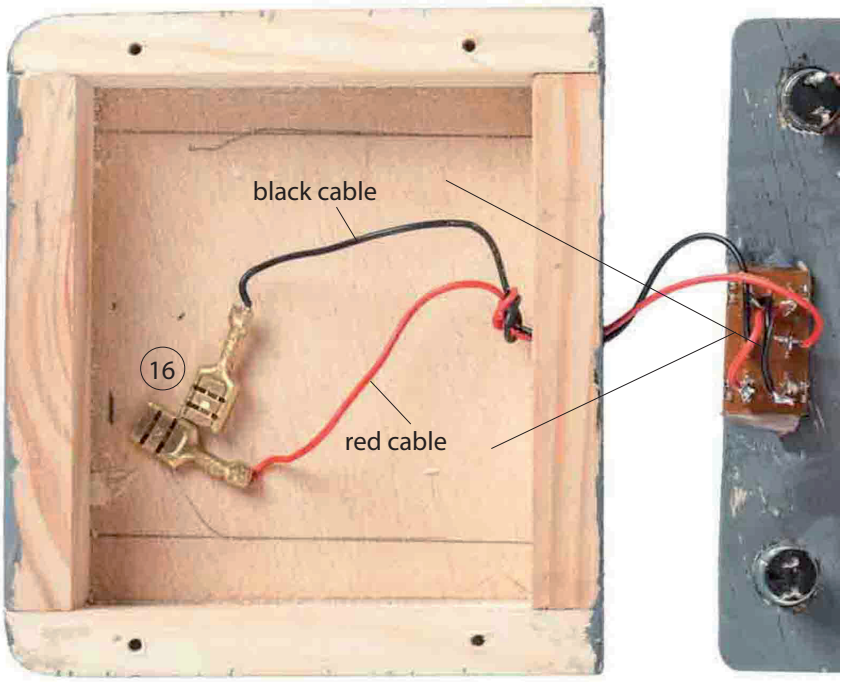
13. Glue the pieces 7a-7d on the base (1b), as shown.

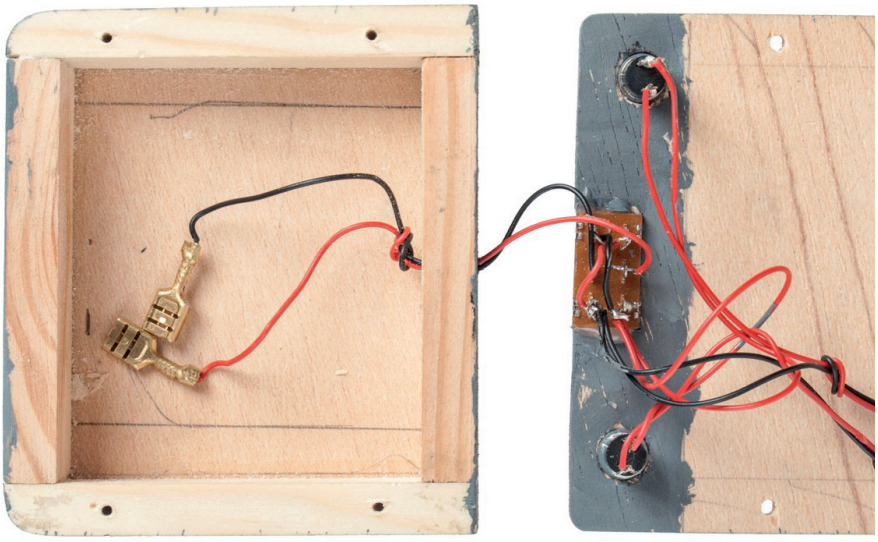


14. Glue the slide switch(13) into the opening (Teil 1a) and put the two push buttons into the drilling holes. Fix them with the appendant nuts.

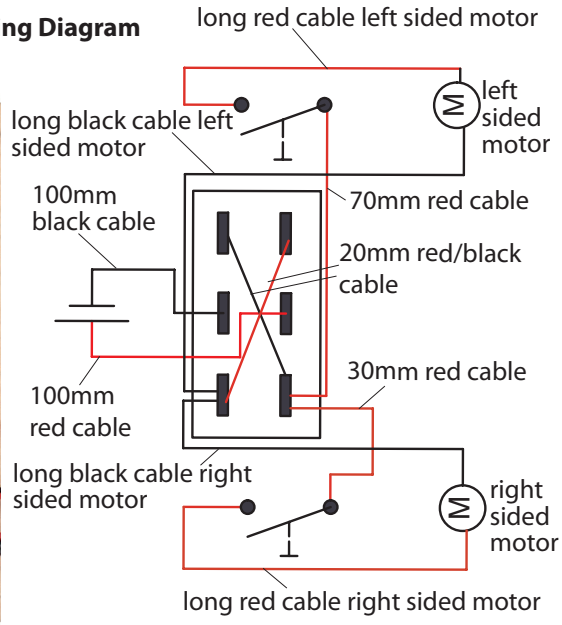
Cabling of the control:

15. Take a red and a black cable and cut a piece of 20 mm of each wire. Now re isolate the 4 ends and tin them. Connect the two cables crosswise to the external connections of the slide switch. (see diagram; the connections of the slide switch are the black rectangles; black cable: from left top to right bottom; right cable: from left bottom to right top) Take the red and black 200mm cable and cut them in half. Re isolate and tin the wire ends. Furthermore take one half of the red cable and connect it with the middle connection of the slide switch on the right side. After that take one half of the black cable and connect it with the middele connection of the slide switch on the left side. Put the two cables through the drilling 7d) and knot them together in the middle. See picture. Last but not least sold a flat receptacle (16) on each end.



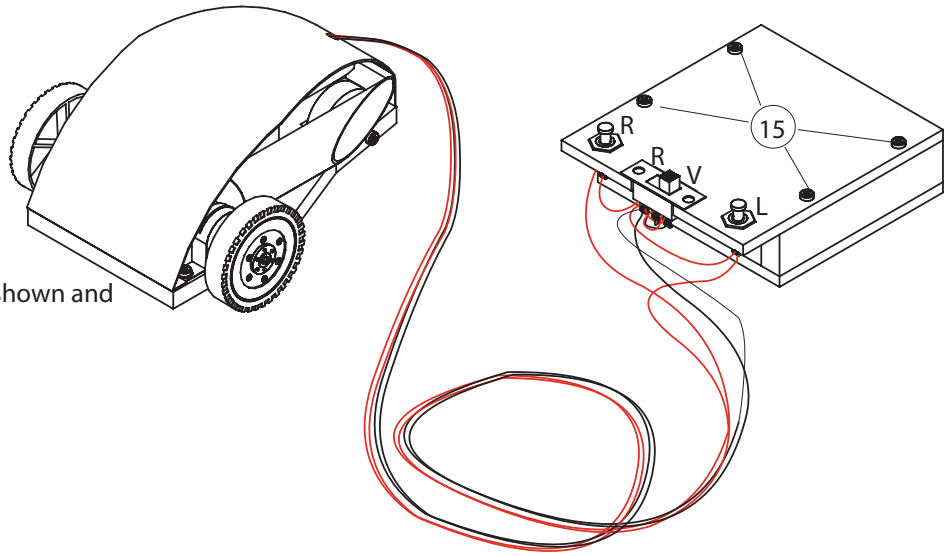


Wiring Diagram



16. Take one 100mm long red cable and cut it to 30mm. Re isolate and tin the ends. Now connect one end with the front left inward facing connection of the slide switch. (In the wiring diagram it is the lowest black rectangle on the lright side.) Connect the other end to the left push button. (It looks like a seesaw on the diagram) After that connect one end of the remaining piece of the red cable (70mm) to the same slide switch connection. Connect the other end with the right push button.
Moreover connect the two long red cables, coming from the engines, to the free connections of the push buttons and connect the two long black cables, coming from the engines, with the left sided outwards facing slide switch connection. (It is the lowest black rectangle on the left side) (See wiring diagram) Last put the batteries into the control box and connect it to the flat receptacles, red cable = + and black cable = -.

17. Replace the lid on the control as shown and fix it with 4 screws (15).



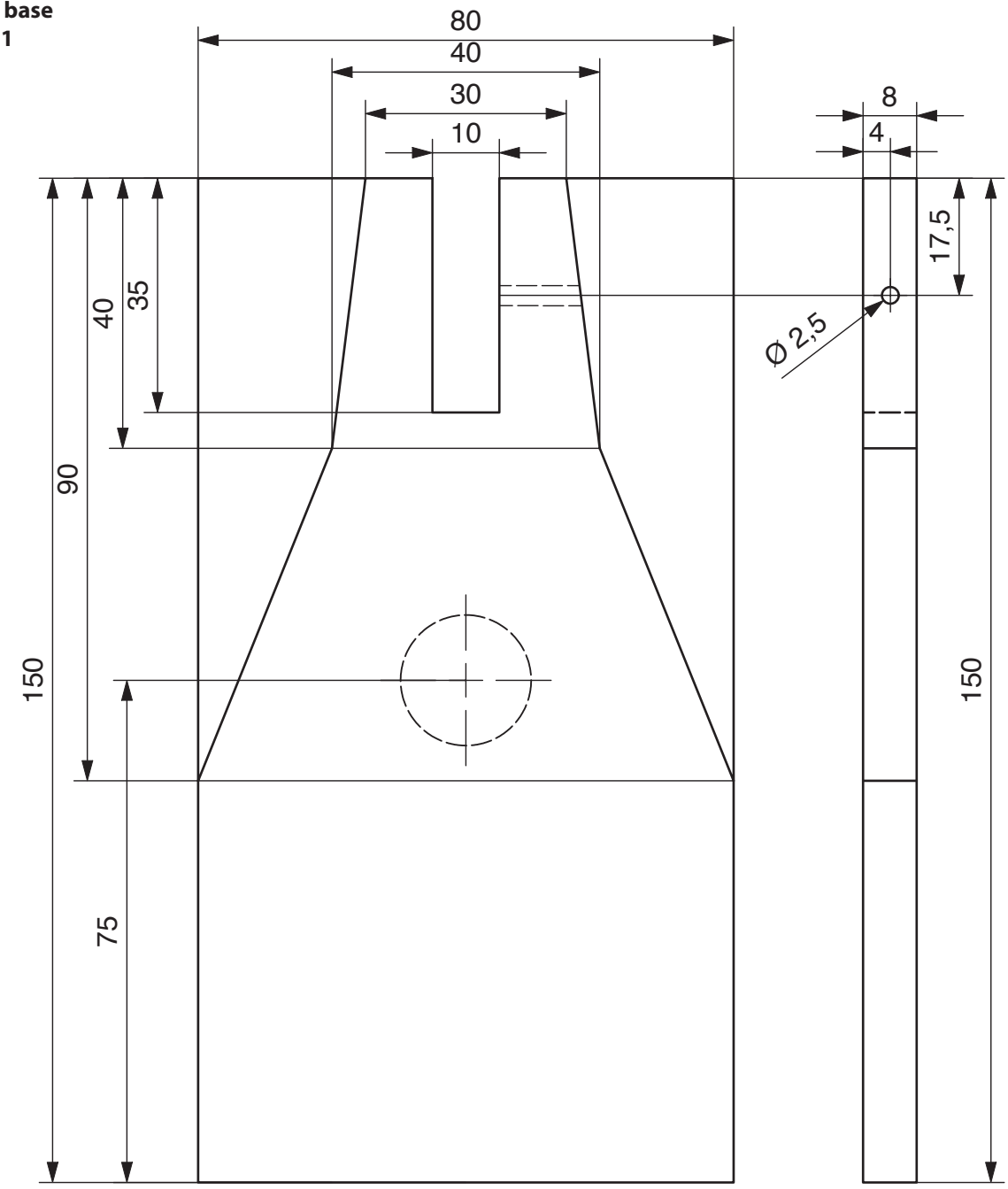
Hint:

After function control glue the construction on the base with wood glue.

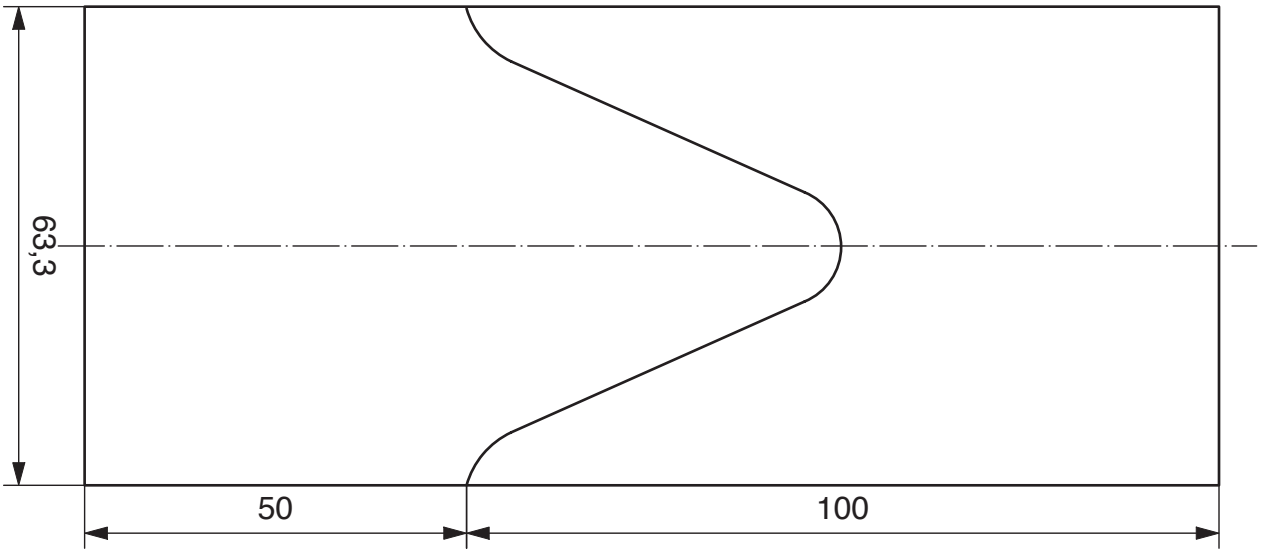
Funktionsbeschreibung:

Taster steuern die Motore einzeln links und rechts. Der Schiebeschalter ist ein Umpolschalter, d.h. Stellung V, Speedy fährt vorwärts, Stellung R, Speedy fährt rückwärts.

Template base
Scale 1:1



Template hard paper pipe
Scale 1:1



Template grey cardboard mouse
Scale 1:1