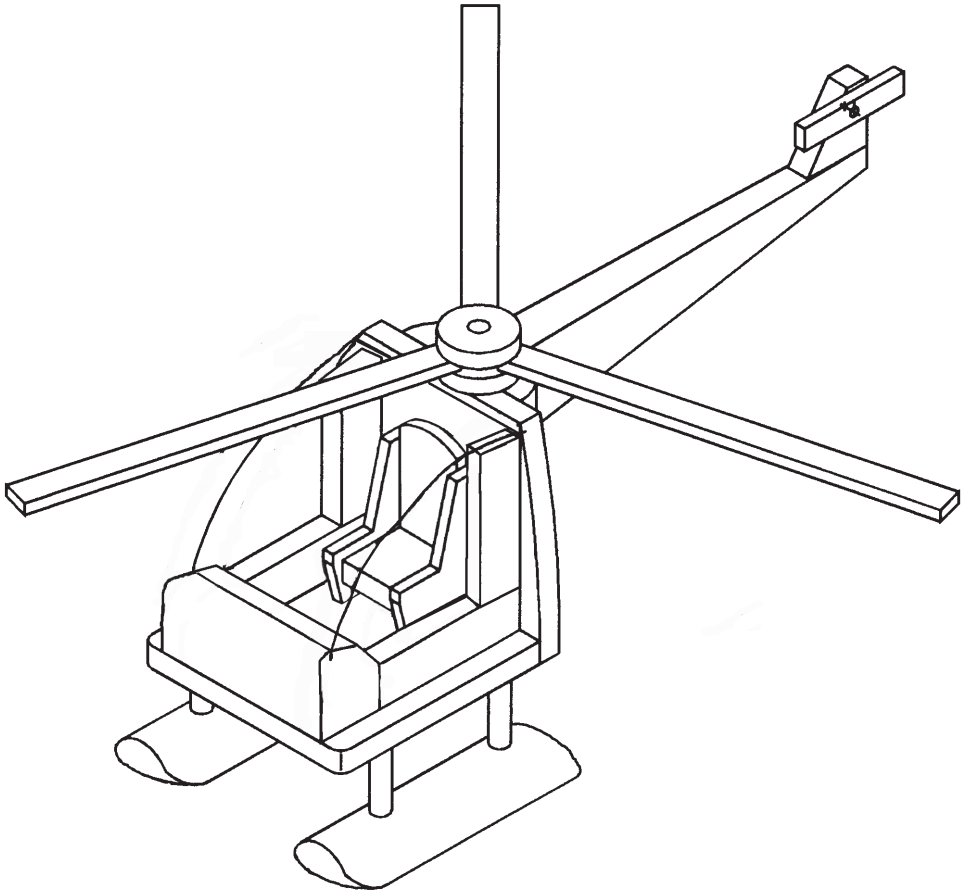
OPITEC

102.713
Helicopter



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 Technolo- gy.These projects should only be undertaken and tested 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. Dan- ger of suffocation!

1. Information:

Article: model helicopter

Age: 11 - 12 years

2. About the process:

Materials: pine, a soft wood which should be dry before being worked on;

Working: pine can be sawn, rasped, filed, drilled and sanded;
measurements can be marked out on the wood or
shapes drawn out using patterns or stencils.;

Joining: dowel joints, or glueing (PVA);

Surface finishing: use wax (solid or liquid);
wood varnish;
staining (colour water based stains - then varnished);

3. Tools:

Sawing: **Fret saw**ffor curves and shapes;

Note! the teeth of the blades should face forwards

Use a fret saw clamp to hold your work, saw carefully with regular straight strokes, turning the work as you go;

Dovetail saw for straight cuts and sawing small sections of wood;

Note! hold the work in a clamp

Gents saw for small cuts in stripwood and dowels;

Rasps/file: depending on the required finish of the work, first use a rasp and then finish with a woodfile. Choose the correct shape of rasp/file for each job;

Note! rasps and files only cut in a forward direction

Sanding: Use a sanding block for flat surfaces and edges, and loose sheets for individual shapes

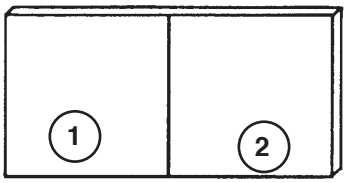
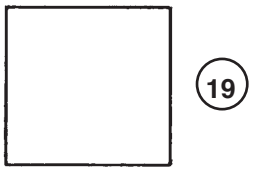
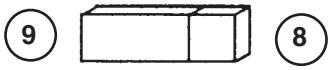
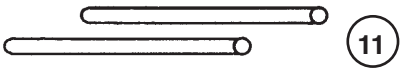
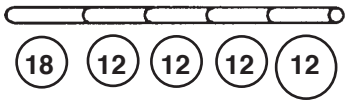
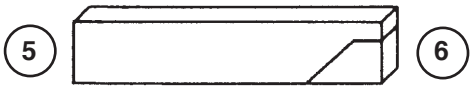
Drilling: Use a hand drill or pillar drill;

Note! pay attention to the safety rules (long hair tied back, no jewellery or loose clothing, wear safety glasses and make sure that the work is held in a clamp)

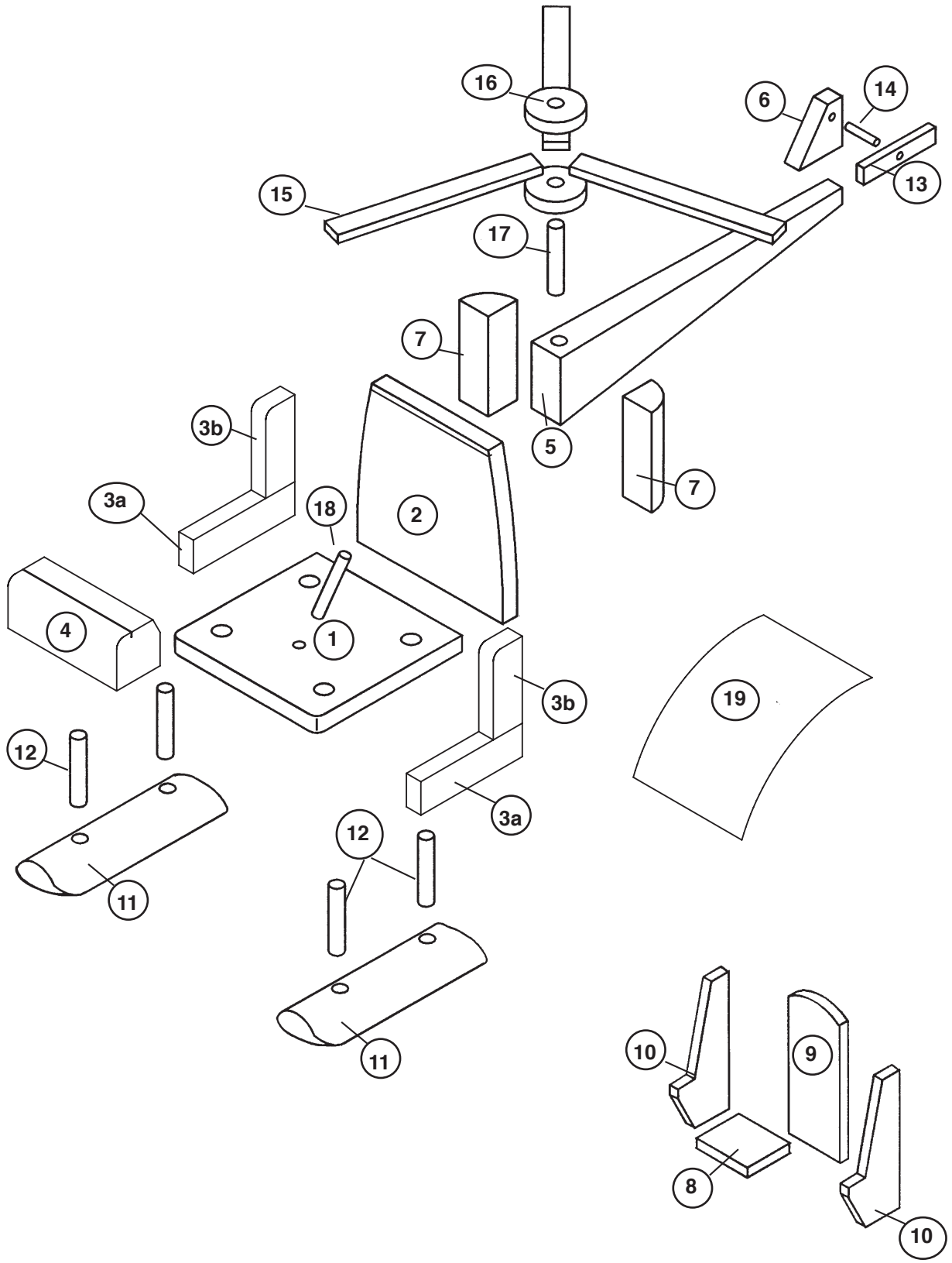
Take especial care when using Forstner bits!

Clamping: when you are using a clamp, make sure that it does not mark or damage your work

4. Parts List:

Description	Material	Quantity	Drawing / Part n°	Size
Cockpit	board	1		200 x 100 x 15 mm
	strip	2		150 x 20 x 10 mm
	strip	1		75 x 30 x 30 mm
	Vacuum forming plastic	1		120 x 120 x 0,5 mm
Seat	strip	1		100 x 30 x 5 mm
	strip	1		150 x 30 x 5 mm
Skids	dowel	2		ø 20 x 150 mm
	dowel	1		ø 8 x 250 mm
Rear tail	strip	1		200 x 40 x 20 mm
	strip	1		75 x 30 x 30 mm
Rotor	strip	3		150 x 15 x 5 mm
	strip	1		50 x 15 x 5 mm
	dowel	1		ø 4 x 100 mm
	discs	2		ø 30 x 8 mm

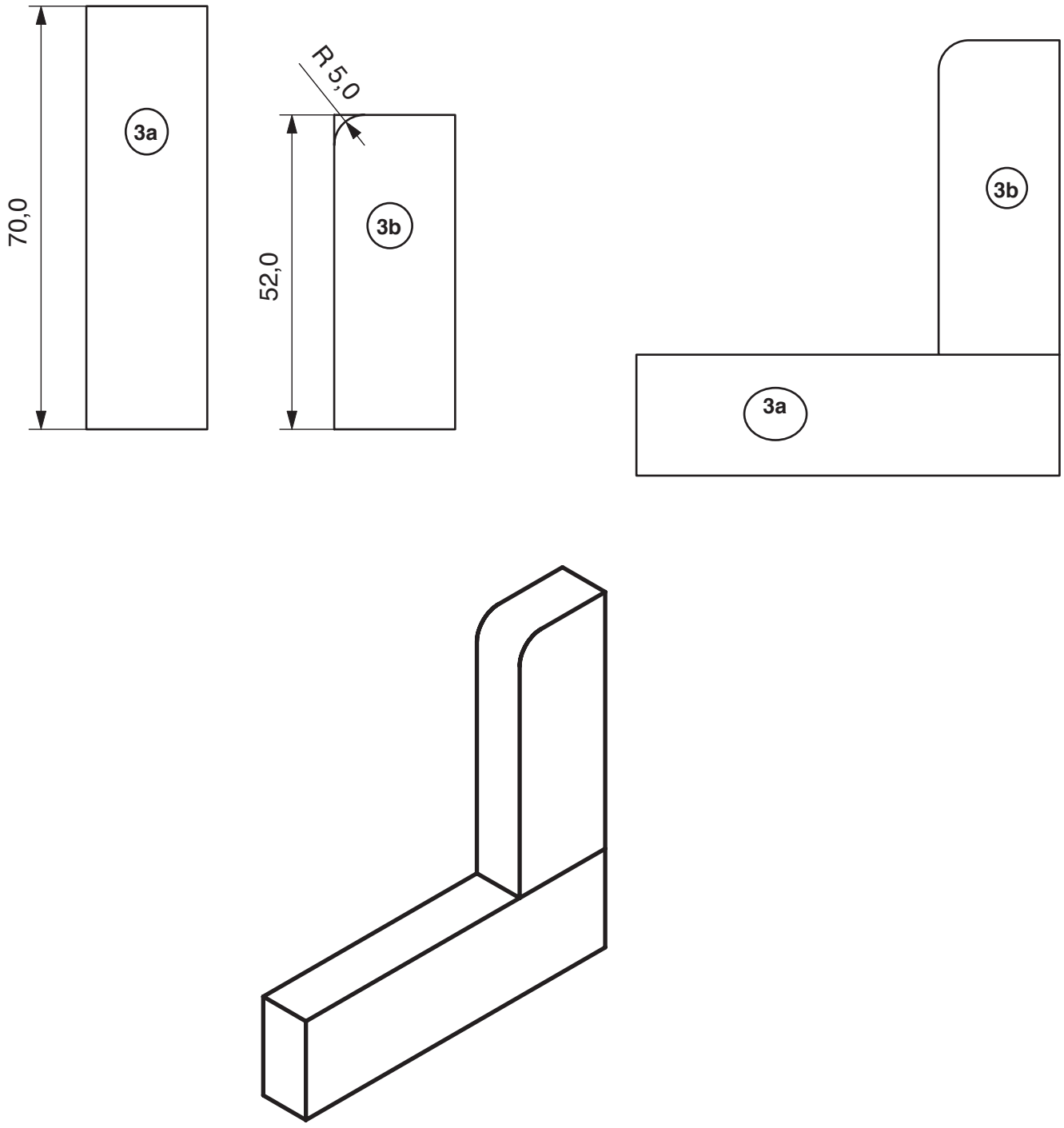
5. Exploded drawing:



6. Table of contents:

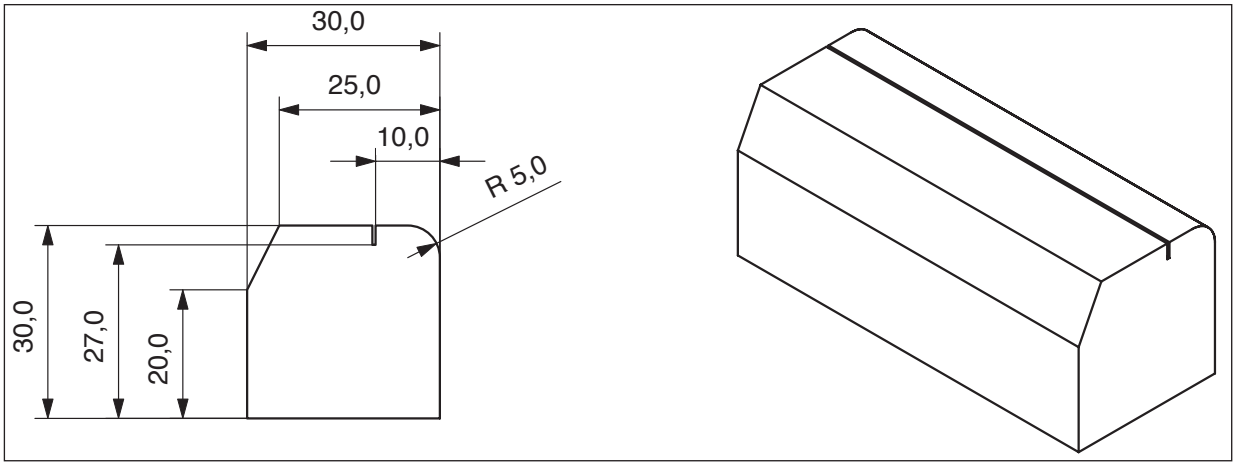
6.1. Making the cockpit:

The cockpit sides (Part 3a / 3b) are made from the pine strip 150 x 20 x 10mm (Part 3) and should be marked out according to the plan. Saw them to length, round the ends, then assemble and glue them together to make the sides as shown.



6.1. Making the cockpit:

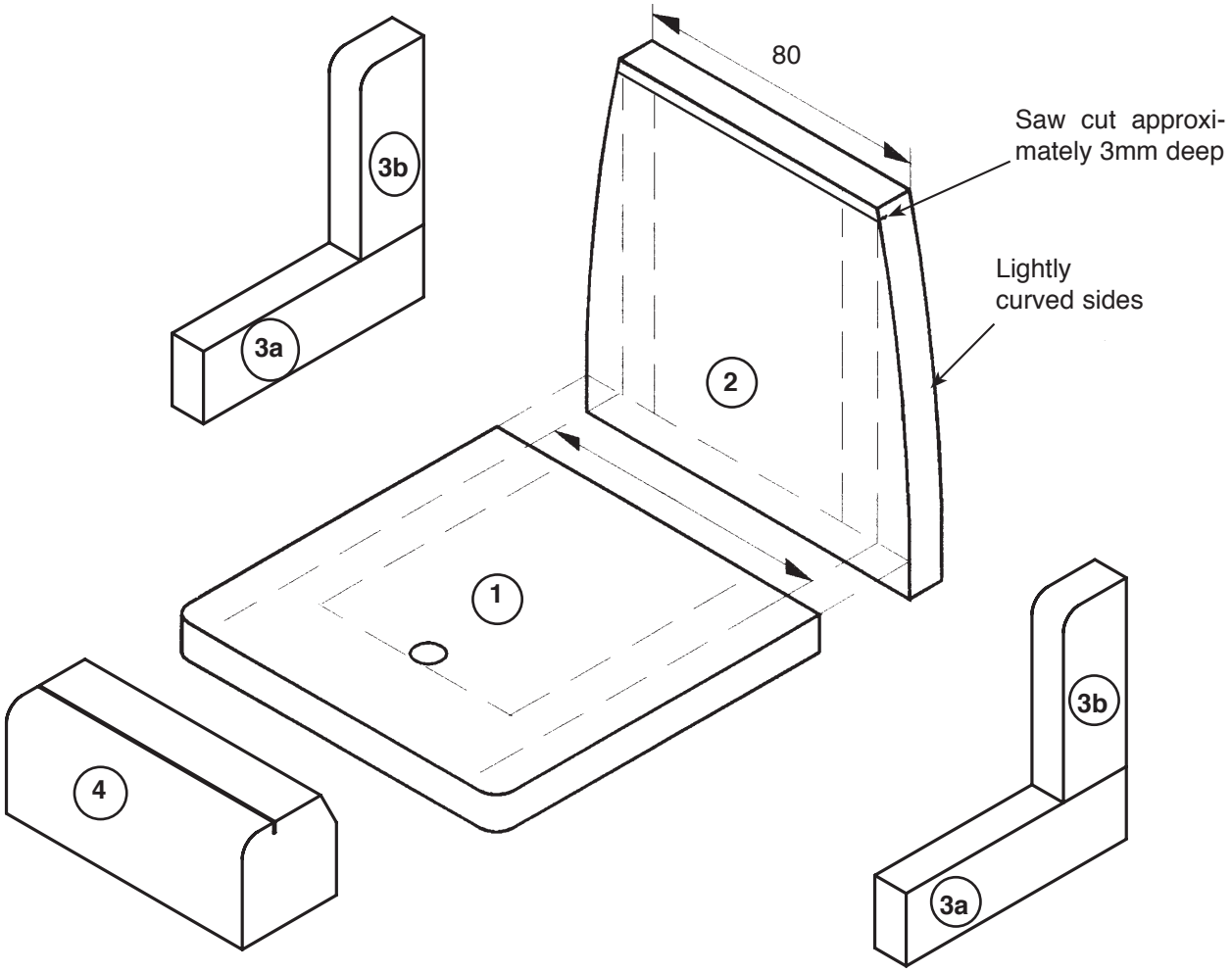
Shape the instrument panel (Part 4) 75 x 30 x 30mm as shown, slope the front and round the rear edge and then make the 3mm deep saw cut as shown.



Saw the wood strip 200 x 100 x 15mm through the middle.
Take the wood strip 100 x 100 x 15mm cabin floor (Part 1) and in the middle, 35mm from the front edge drill a 8mm diameter hole. Make sure that this hole is sloped at an angle of approx 60 degrees (To take the joy-stick)

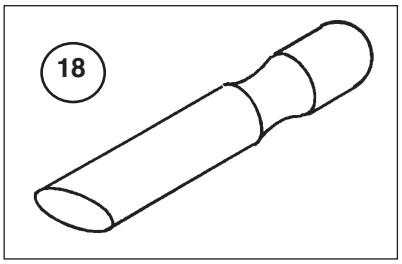
Hole 8mm diameter

Finally round off the front corners of the cabin floor.
The rear wall of the cabin (Part 2) should be lightly rounded and a 3mm deep saw cut made across the top.
Glue together (Part 1) cockpit floor, instrument panel, (Part 2) cockpit sides (Parts3a/3b and rear wall (Part 2)



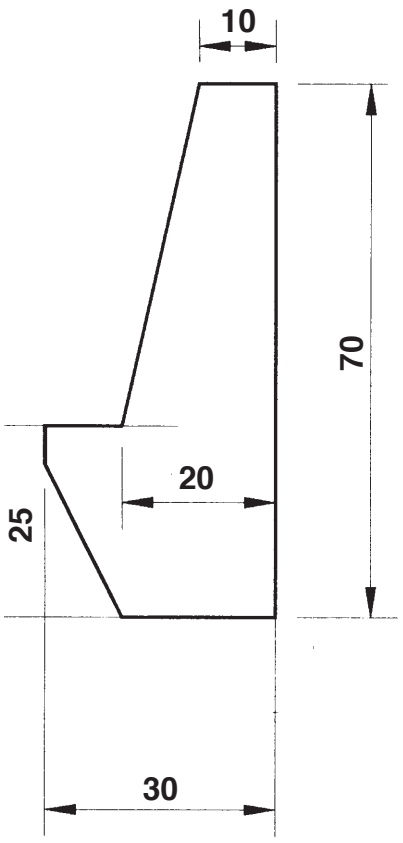
6.1. Assembling cockpit:

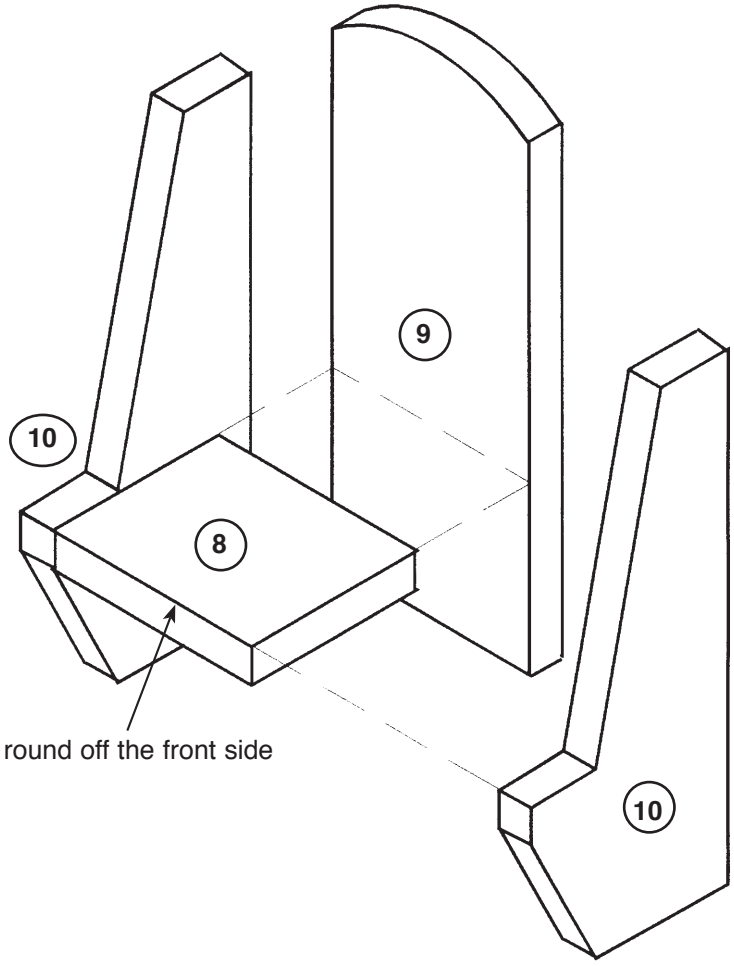
Joystick (part n° 18)
Cut a length of 60 mm from the dowel ø 8 x 250, and shape it to form the joystick.



Pilots seat (part n° 8, 9, 10)
Take the strip 100 x 30 x 5 mm and shorten it to 75 mm and round off the end. The remainder is used to design the seat back and sides.

first glue the sides

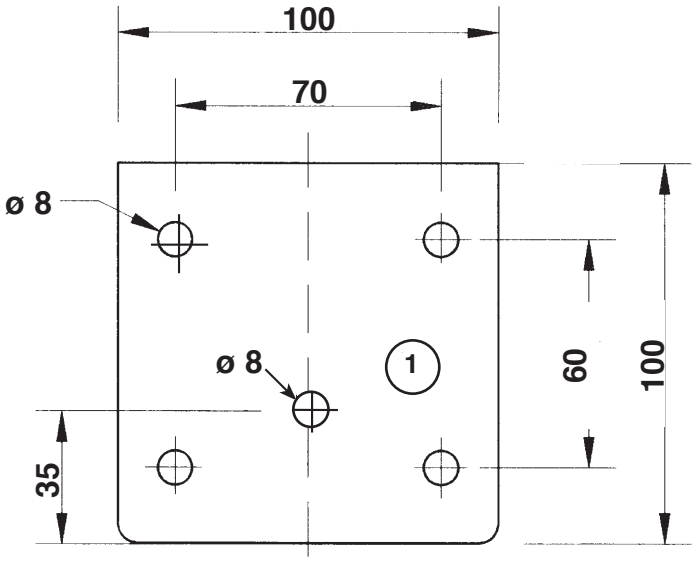




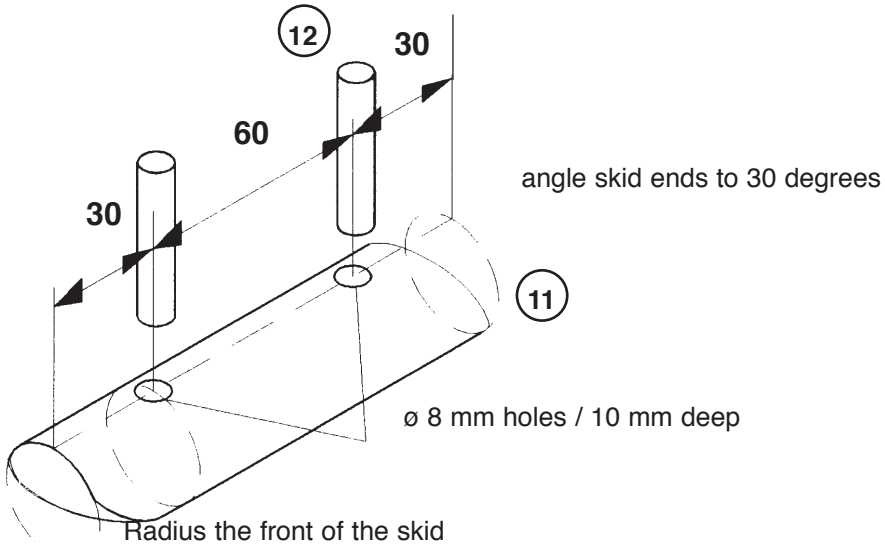
Remark: You can of course make the seat sides to your own design

6.2. Assembling skids:

Turn the completed cabin upside down and hold it in a vice. Mark out the 4 holes as shown and drill them 8 mm deep.



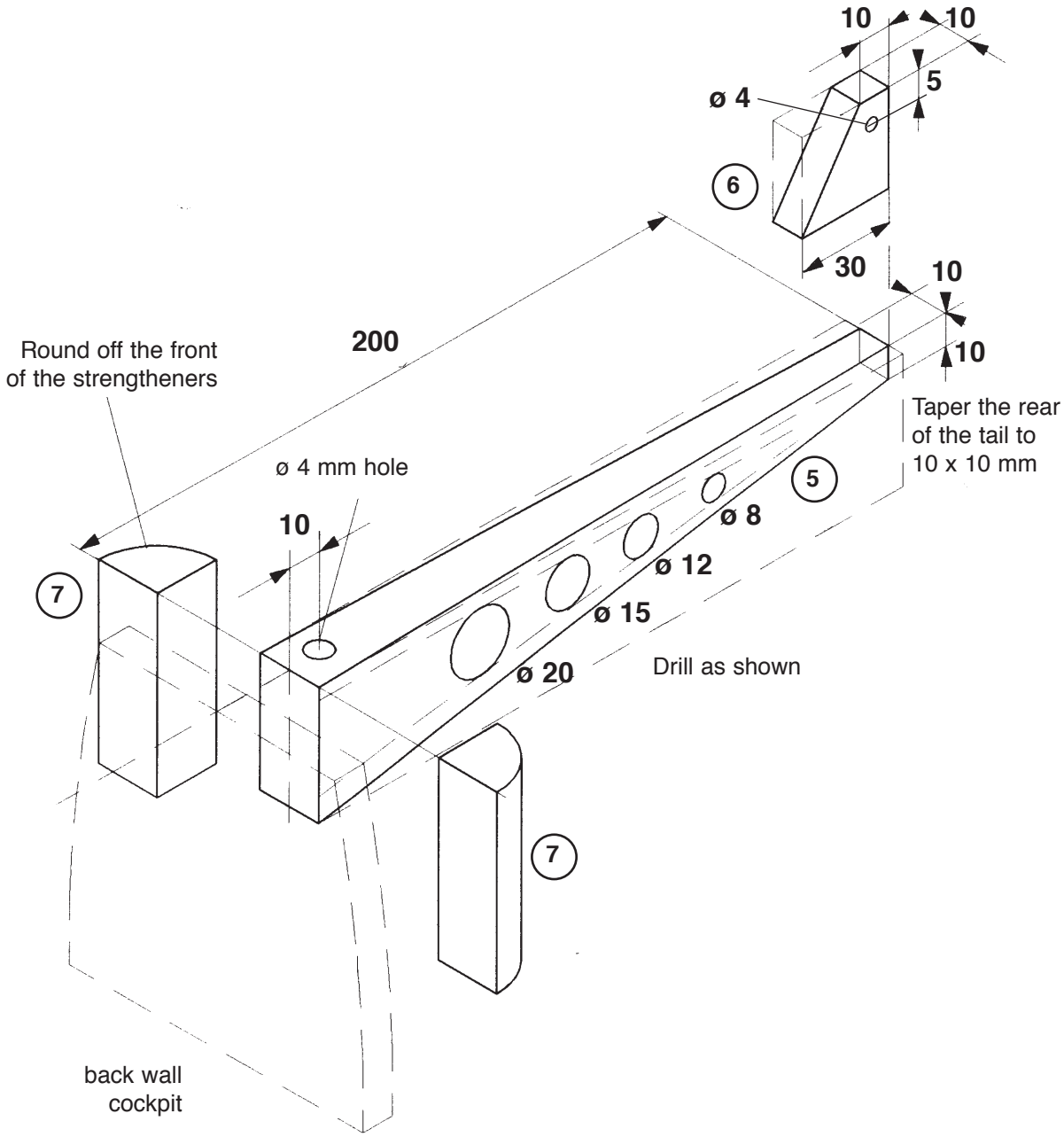
After this stage saw four lenghts of dowel, each 40 mm long (dowel part n° 12). Then drill the holes in the skids (part n° 11) as shown for the skid.



6.3. Assembling rear tail:

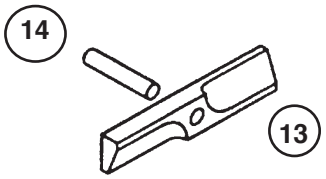
Saw the tail section from the strip 200 x 40 x 20 mm (part n° 5 and 6). Glue the parts together as shown in the diagram and then drill the holes. (remember the safety precautions!).
Finally saw the strip 75 x 30 x 30mm (Part n° 7) in half (approx 37mm) round off the outer edges (see diagram) and glue them in place either side of the tail boom.

Now glue the complete tail section to the cockpit.

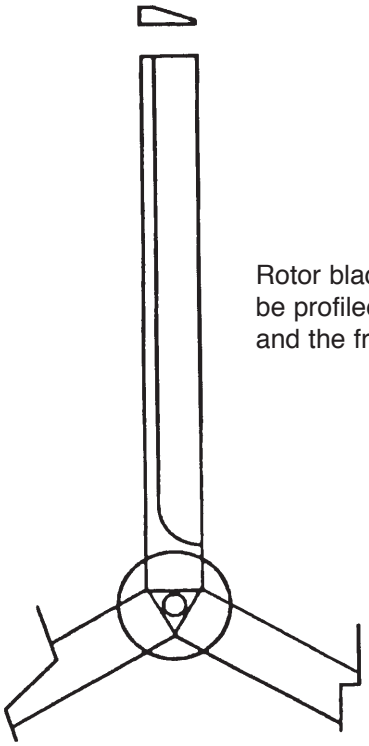


6.4. Assembling rotors:

The rear rotor (part n° 13) is made from the strip 50 x 15 x 5 mm which is drilled in the middle (ø 4 mm) and then mounted with the dowel ø 4 x 15 mm (cut off part n° 14 from the dowel ø 4 x 100 mm)

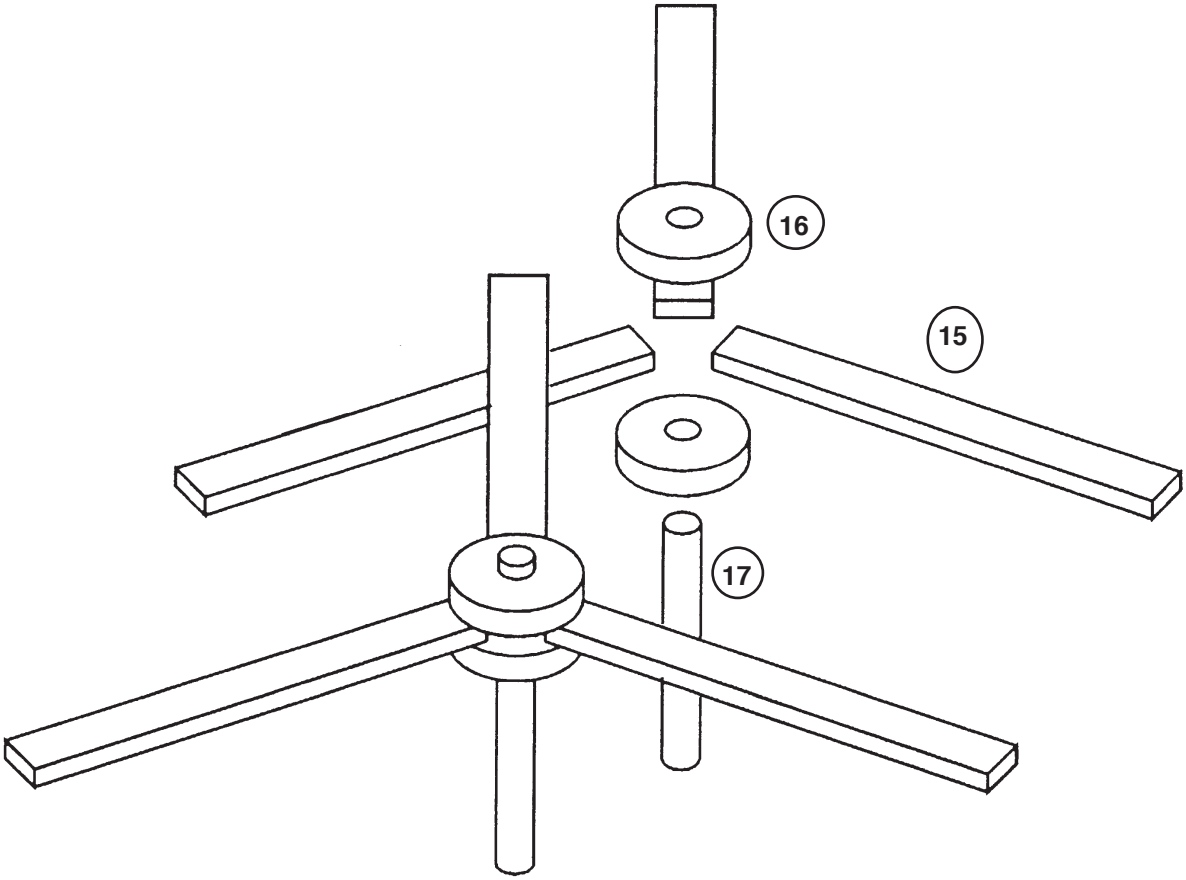


glue part n° 13 and part. n° 14 exactly



Rotor blades should be profiled as shown and the front edge rounded.

Main rotor (part n° 15) is made up from the three strips 150 x 15 x 5 mm. Glue the rotor blades to the lower disc.
Note! stick to 3 x 120°! Fix the rotor onto the dowel ø 4 x 85 mm (part n° 17) and put it in the drilling of the tail section (part n° 5).
If necessary, you might shorten part n° 17.



Helicopter:

The vacuum forming plastic (Part 19) should be cut to suit the width of part 4, 75mm wide and inserted into the saw cuts in Part 4 and Part 2

Now all you need is to add the seat!

How would your model look if some parts were painted?