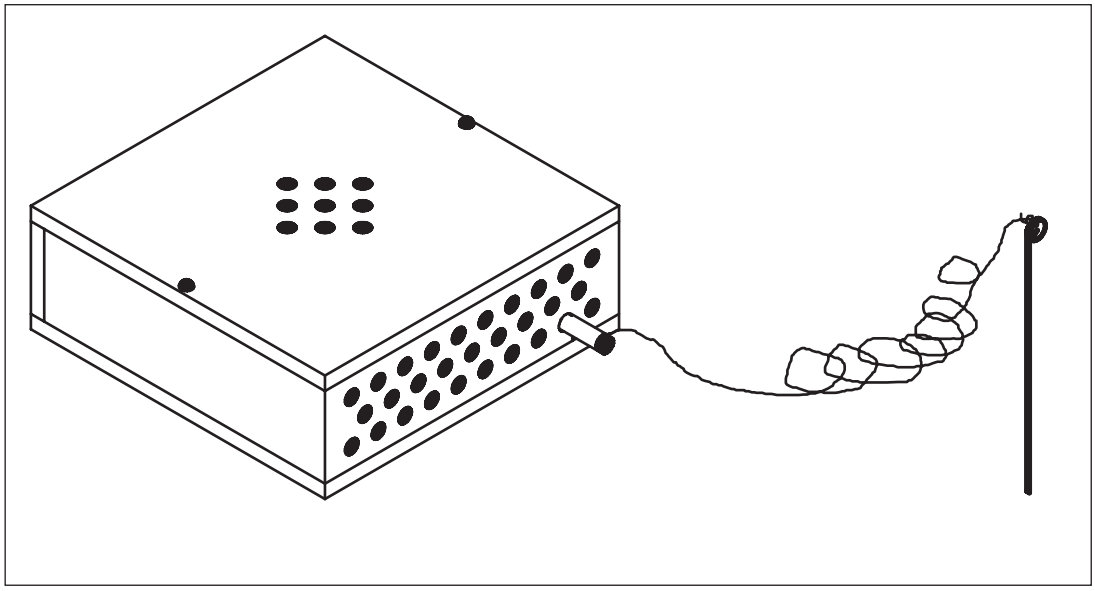
105.445

Alarm



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. Product information:

Article: Battery operated circuit

Use: in Design Technology Key Stage 3

2. Material information

2.1. Material: Pine (coniferous) softwood
Wood should be realtively dry before working
Gabun plywood, multi layered

Working: All wood can be sawn, filed, drilled and sanded
Measure to size or use a pattern

Joining: Use PVA white woodworking glue;

Finish: Use wax (liquid or solid)
Paint (undercoat and top coat)

2.2. Material: Welding rod (steel)

Working: Bending

Joining: Tie with a threadr

Finish: None necessary

2.3. Components:

Battery holder: to hold one mignon cell (AA)

Pulse tone buzzer: Changes electrical energy into sound

Wire: Insulated single core (0.5mm)

Brass band: Contact stripr

3. Tools

Sawing: Use a ***fret saw*** for all curves and round shapes.

Note! The blades fit the saw with the teeth facing forward

Use a proper fret sawing board and saw with slow even strokes.

Use a **fine bladed saw** for straight cuts

Note! Clamp the work in a vice

Filing: Choose a suitable grade file for the work

Note! Files only cut on the forward stroke!

Sanding: Use a block and glasspaper for all flat surfaces
Loose paper can be used for curves and individul forms

3. Tools

Drilling: Use a handrill or a pillar drill

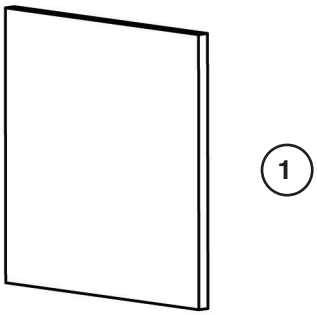
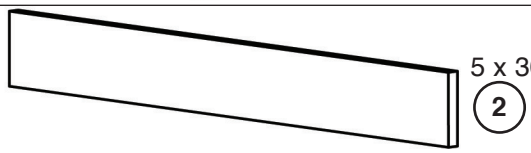
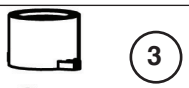
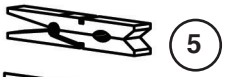
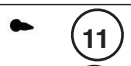
Note! Take care when drilling and adhere to the safety rules, tie all long hair back, remove rings and jewellery. Hold work to be drilled in a vice

Cutting: Use side cutters for cutting the insulated wire and brass strip

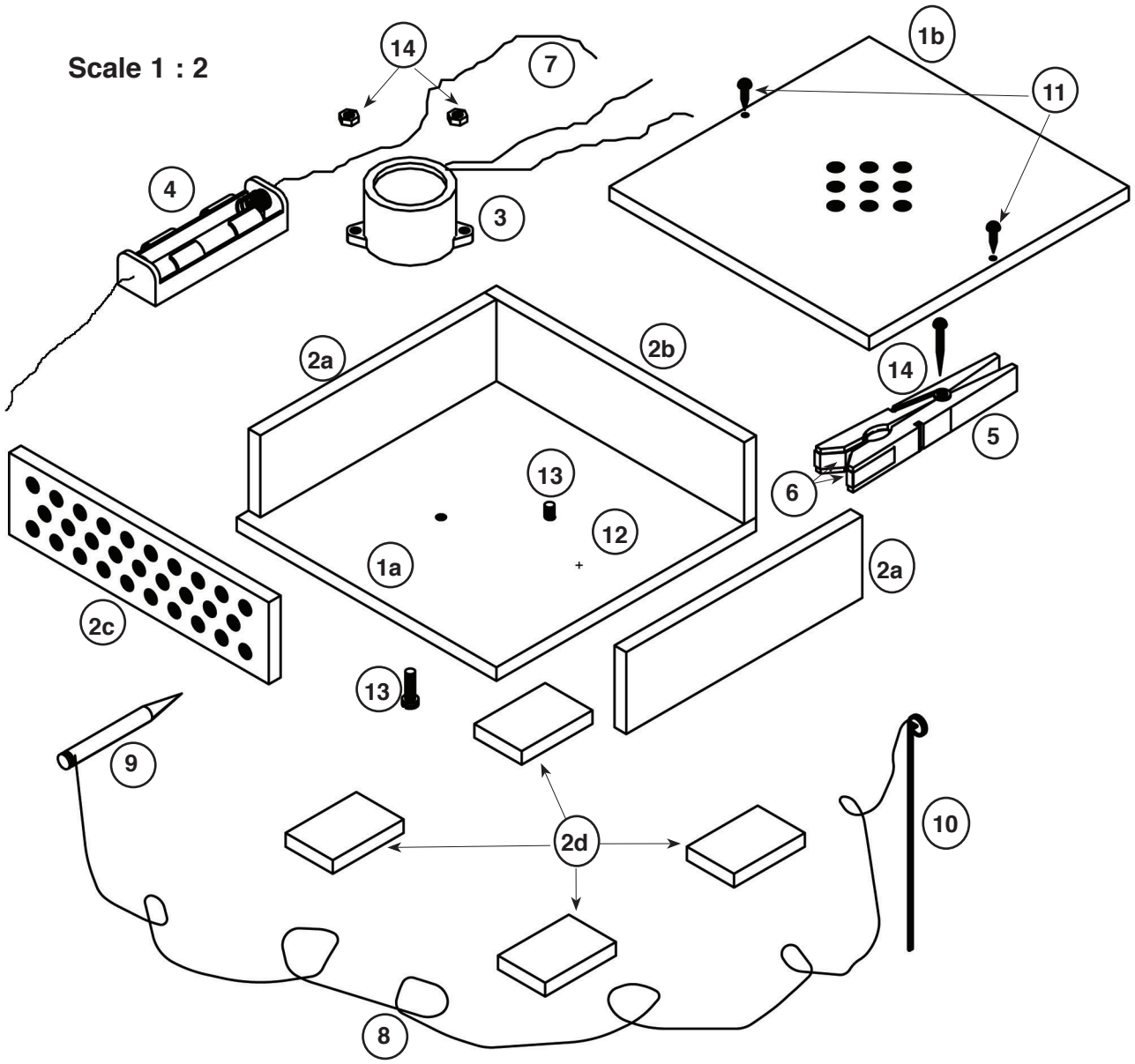
Soldering: For soldering use a 15-30 Watt iron with a fine tip and a flux paste

Note: A hot soldering iron can cause burns.
Electronic solder already contains flux.

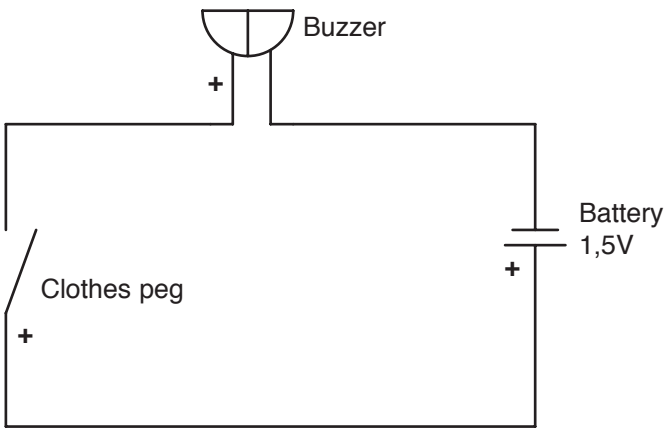
4. Parts list:

Part	Material	Quantity	Diagram / Part No	Size
Base (1a) **Cover** (1b)	Plywood	2		5 x 110 x 110 mm
Frame (2a-c) **feet** (2d)	Pine	2		5 x 30 x 250 mm
Alarm components	Buzzer	1		
	Battery holder	1		1x Mignon
	Clothes peg	1		
	Brass strip	1		0.3 x 5.5 x 150 mm
Trip wire	Nylon thread	1		Ø 0.3 x 2000 mm
	Beech dowel	1		Ø 3 x 50 mm
	Welding rod	1		Ø 1 x 100 mm
Sundries	Screws	2		2 x 10 mm
	Bolt	1		M3 x 16 mm
	Bolt	2		M3 x 10 mm
	Nuts	4		M3

5. Exploded diagram:



6. Wiring diagram



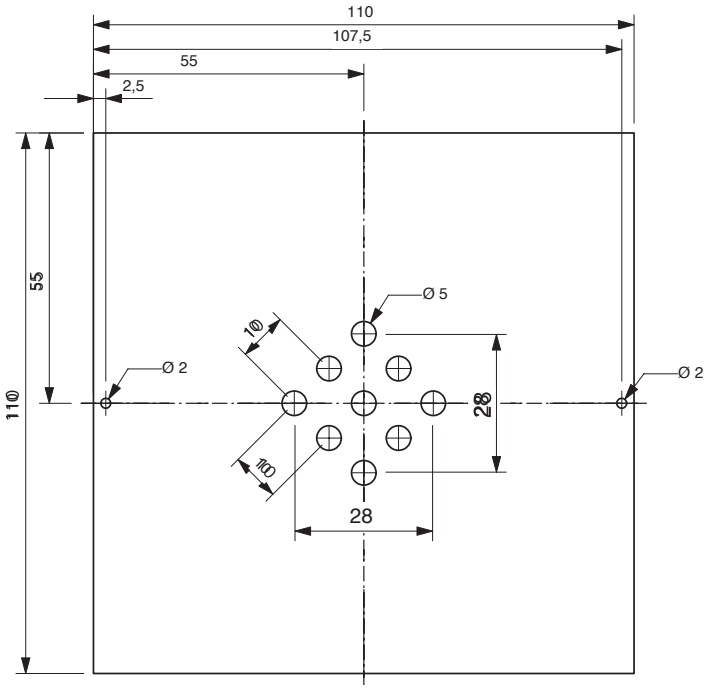
7. Planning and Making

7.1 Planning and making the case

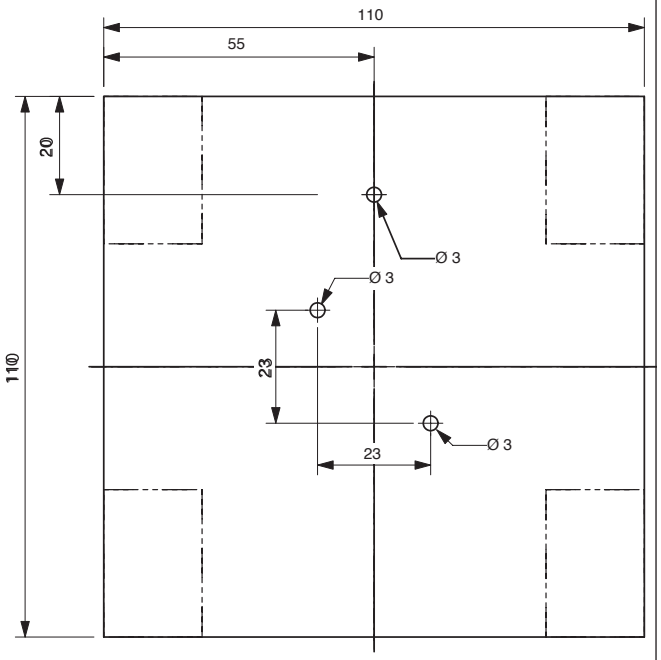
7.1.1 Drill the base (1a) and the cover (1b) as shown in the diagram (see page 9)

Note: The dotted line on the base shows the position of the circuit

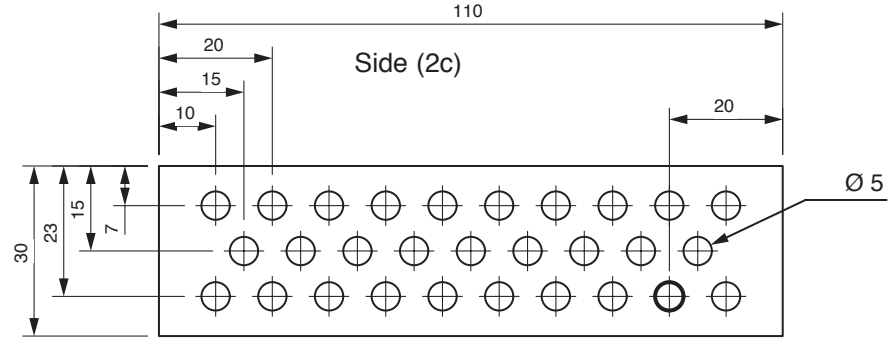
Cover (1b)



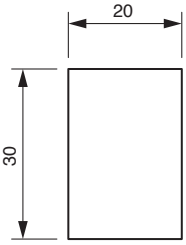
Base (1a)

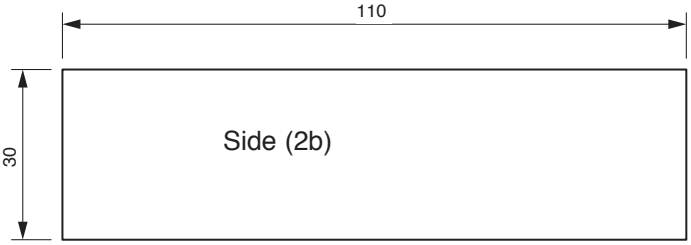


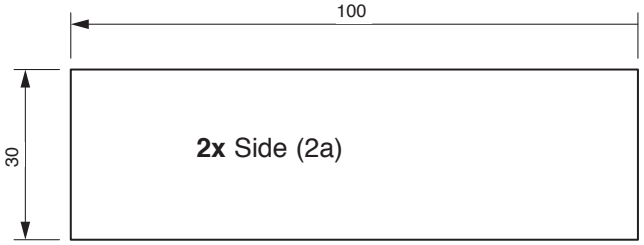
7.1.2 Mark out and cut the sides so that two (2b+c) are 110mm long and two (2a) are 100mm long. The four feet (2d) are 20mm long (see diagram)



4x feet (2d)







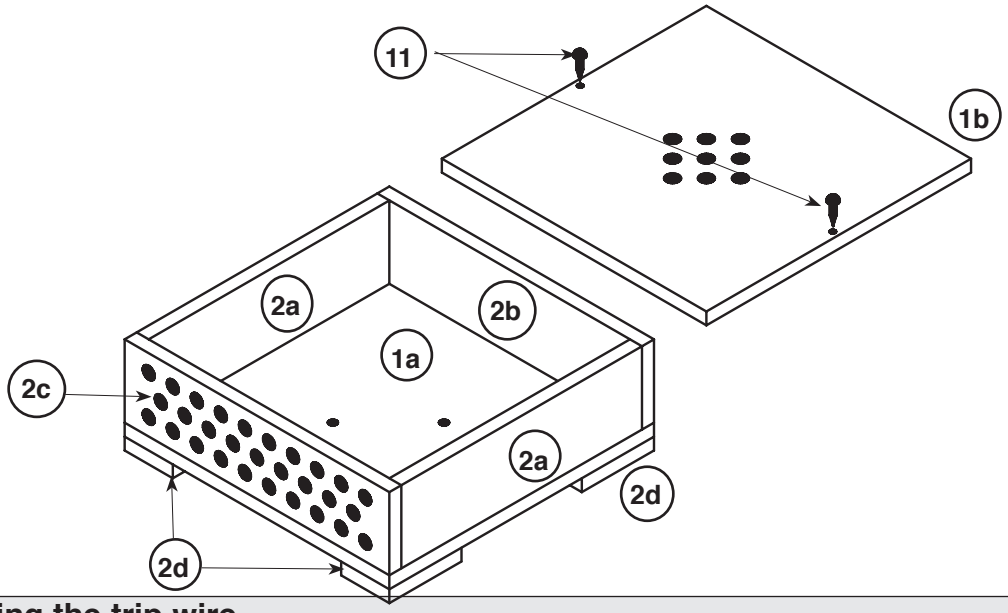
7.1.3 Finally mark out and drill the side (2c) as shown in the diagram (see page 5)

Note. The number of holes in the side make it difficult for the alarm to be 'cracked' and at the same time you can hear the 'noise' better.

7.1.4 Glue the feet in the corners of the frame

Note: Make sure the case is made properly so that that the dowel can be inserted into a hole and into the clothes peg.

7.1.5 Fix the cover with two small screws so that it fits properly, then remove it once again to complete the project



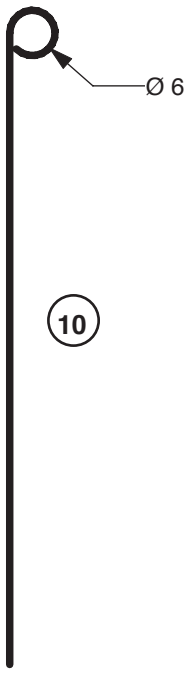
7.2 Making the trip wire

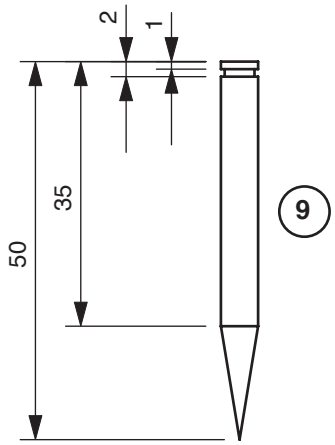
7.2.1 Make a groove in the top of the dowel (9) as shown in the diagram and file a point

Note: The groove can be made with a triangular file. An alternative design is to drill a 2mm diameter hole for the thread instead of the groove.

7.2.2 Bend an eye shape into one end of the welding rod (10).

7.2.3 Thread one end of the nylon line through the eye of the welding rod and wind the other end around the groove in the dowel pin. (or hole if you have chosen that design)



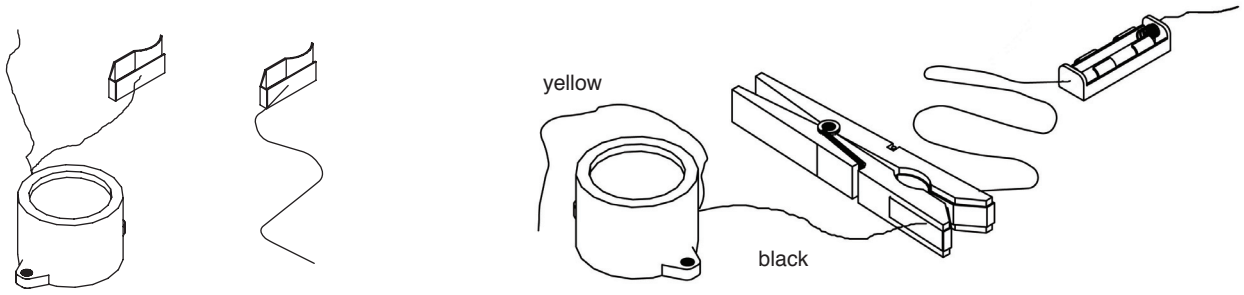


7.3 Designing the switch (clothes peg and brass strip)

7.3.1Cut two pieces, each 35m long from the brass strip and bend them around the ends of the clothes peg. (see diagram)

7.3.2 Solder a formed brass contact to the minus pole(Black cable) on the pulse tone alarm. Solder the black cable from the battery holder to the second brass contact

Note: Due the heat generated when soldering it is advisable to solder the contacts first and then glue them to the clothes peg



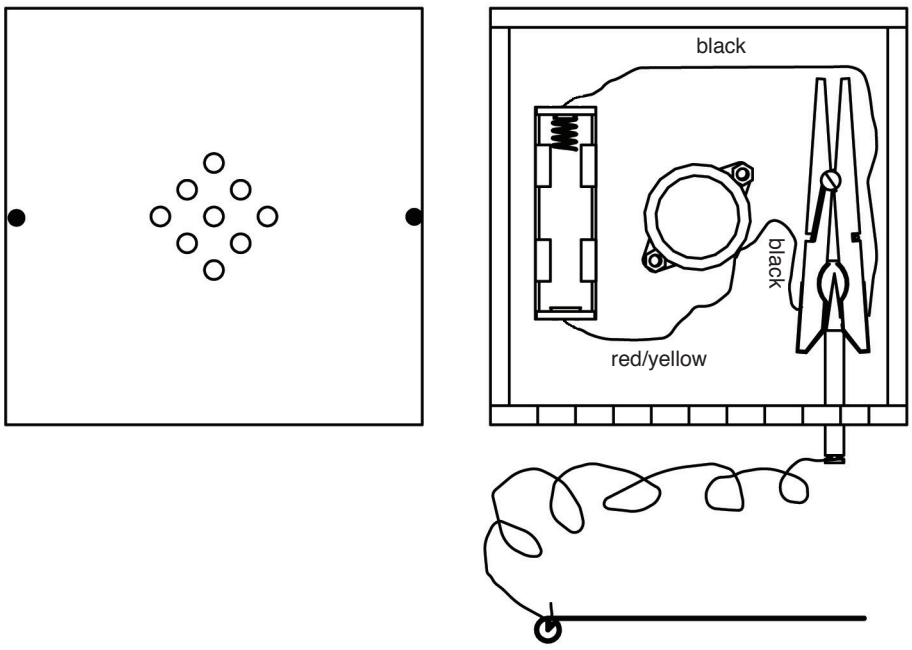
7.3.3 Glue the brass strips to the clothes peg with a hot glue gun or a universal glue.

7.4 Mounting the components

7.4.1 Fix the clothes peg to the base of the box with a small bolt (12) and two lock nuts (14)
Hold (13) the buzzer in place with two nuts (14) and bolts (13)
Fix the battery holder (4) in place with glue gun or universal glue

7.4.2 Solder the plus lead (yellow or red) from the buzzer to the battery holder plus connection. Then solder the wire from the clothes peg to the other side (spring) of the battery holder.

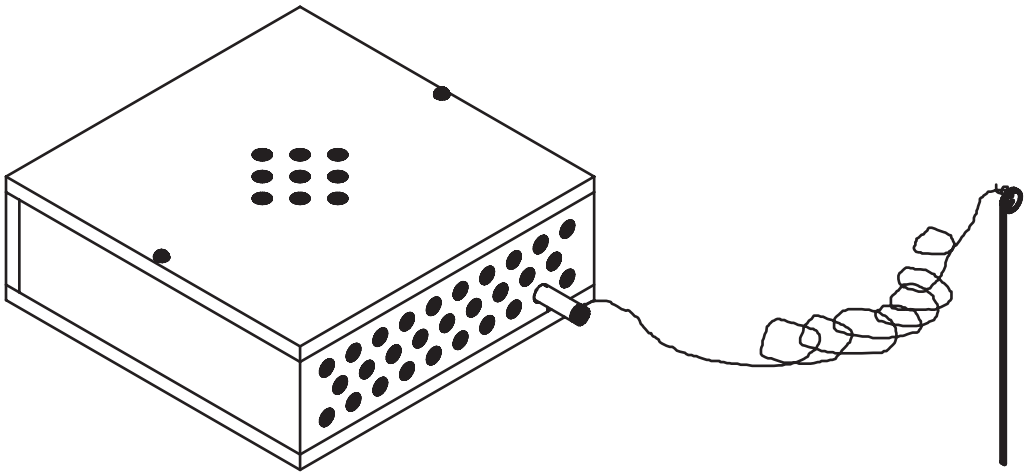
Note: Do not hold a hot soldering iron too long on the battery holder or the conducted heat will melt the plastic and loosen the connector !.



7.4.3 Testing and Evaluating the circuit

Insert the dowel into the corrct hole in the side of the case and in between the contacts on the clothes peg. Now set up the trip wire. When the dowel is pulled out of the box the contacts on the clothes peg close, making the circuit and setting off the alarm. If the circuit does not work, check all the solderjoins

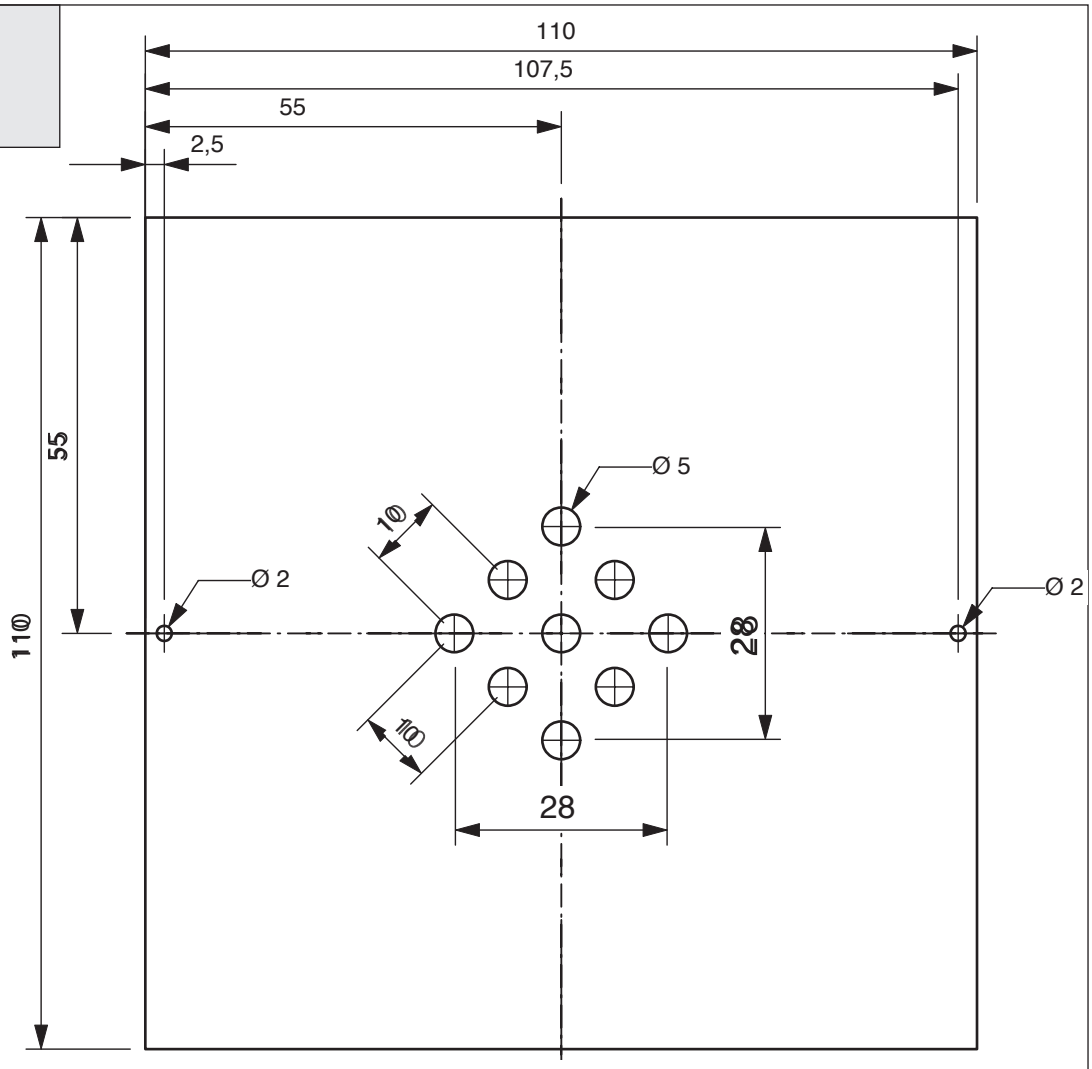
7.4.4 When the circuit has been checked and is working perfectly screw the cover in position..



Patterns

M 1 : 1

Cover (1b)



Base (1a)