OPITEC

110.372

F M Radio

Necessary Tools:
Fretsaw
Ruler,pencil
Sandpaper
Wood glue
All purpose glue
Drill ø4; 4,5,10 mm
Soldering iron, solder
Wire strippers
Side cutters
File
Scissors
Acrylic paint
2-component glue
or glue gun

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!

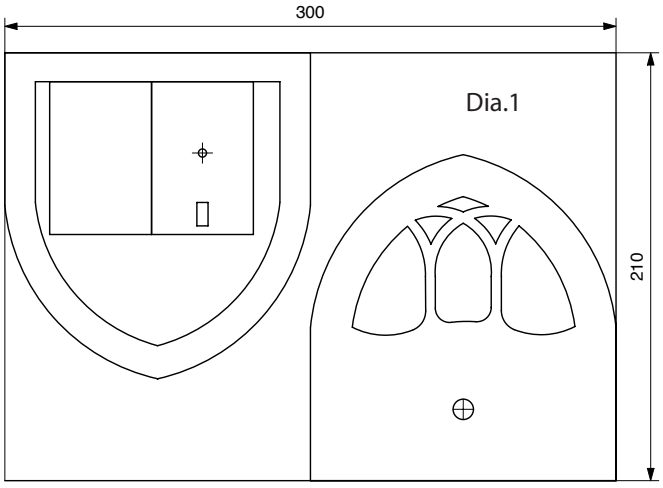
INSTRUCTIONS

PARTS LIST					
	Code	**Quantity**	**Size (mm)**	**Description**	**Teile-Nr.**
PLywood		1	300x210x5	Housing	1
Wooden strip		2	200x40x15	Base plate	2
Modelling plywood		1	300x60x1,5	Top (Version 1)	3
Wooden wheel		2	ø 30	knob	4
Jute material		1	200x145	Loudspeaker cover	5
Loudspeaker		1	ø57	Loudspeaker cover	6
Plastic tube		1	ø4/3	Insulation	7
IC holder 8leg		1			8
Cable		1	2000	Wire aerial	9
IC TDA 7021T		1		Receiver	10
Circuit board for FM-Radio		1			11
IC TDA 7052A		1		NF-Amplifier	12
Potentiometer 1MOhm		1	6		13
Capacitor 820 pF	821	1		C4	14
Capacitor 3,3 nF	3n3	2		C6/7	15
Capacitor 1,0 µF	105	1		C10	16
Capacitor 0,47 µF	474	1		C9	17
Capicitor 4,7 nF	4n7/472	1		C5	18
Capacitor 0,1 µF	104	3		C2	19
Capcitor 0,01 µF	103	1		C1	20
Capacitor 33pF	33	1		C3	21
Capacitor 220 µF		1		Capacitor, C8	22
Micro switch		1	19x6	Switch	23
Flat connector		2	6,3	Battery connection	24
Cable red		1	500	Cable	25
Silver wire		1	500x0,6	Coil	26
Zylinderkopfschraube		1	30x3	Sendereinstellung	27
Nuts		1	M3	Mutter	28

General :
The casing of FM radio is shown in two versions. There are plans for both versions. In the instructions only one variation is described the other version is similar . Both variations are are shown with exploded drawings. (Page 7)

1. Trace or copy the plans for the housing on to the plywood sheet (1) according to the plan (see dia 1 and page 6). Saw out the parts with a fretsaw and sand the edges.

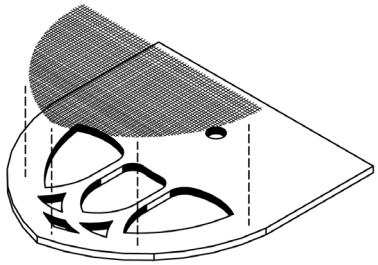
   Also saw out any internal shapes and drill the holes as shown.



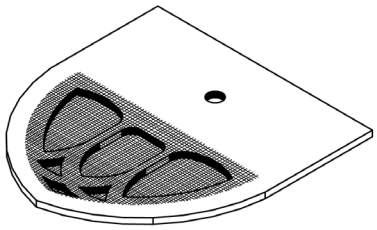
Dia.1

INSTRUCTIONS

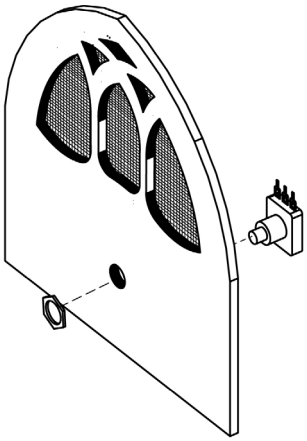
2. Cut the jute (5) as shown so that it covers the cut out on the front of the housing.



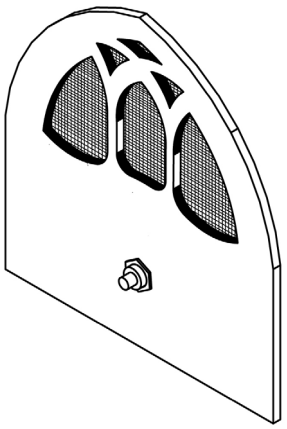
3. Use PVA wood glue to ensure that the jute lays flat over the shapes



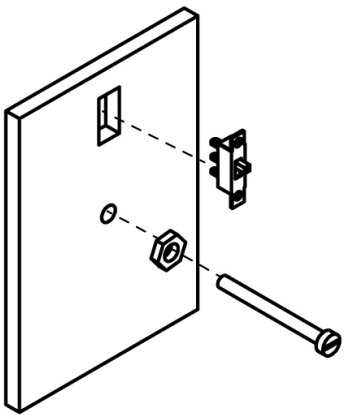
5. Shorten the end of the potentiometer (15) with a fine bladed saw to 10mm and insert it into the hole in the front as shown

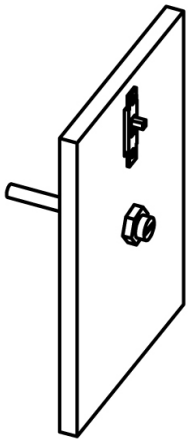


6. Screw the nut on the front and tighten.

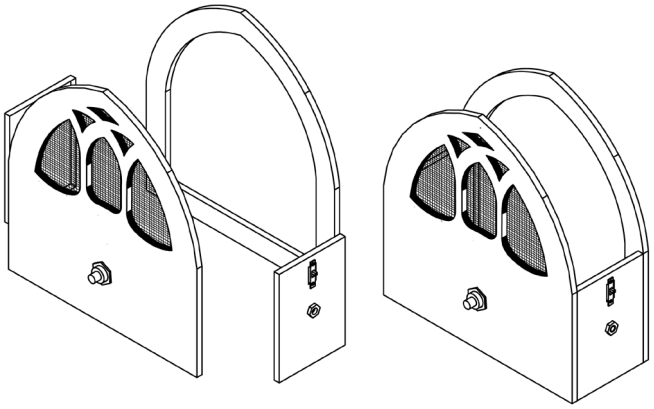


7. Take the side part with the cut out for the switch (22) Insert the switch and glue it in place. Add the nut (28) outside and glue it over the 4mm hole or instant glue. Insert the screw (27) in the nut . No glue should creep on to the thread !

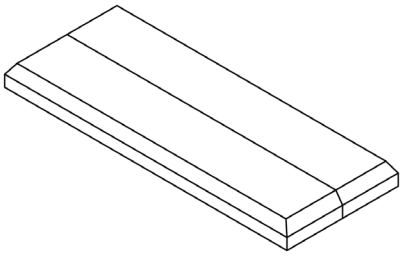




8. Glue the parts together as shown and leave them to dry well



9. Shorten the wooden strips (2) to 170 mm long . (Version 2 do not shorten!) The strips must be chamfered at 45 degrees (see dia.). on three sides. Glue the two strips together on the non chamfered edges and leave to dry.

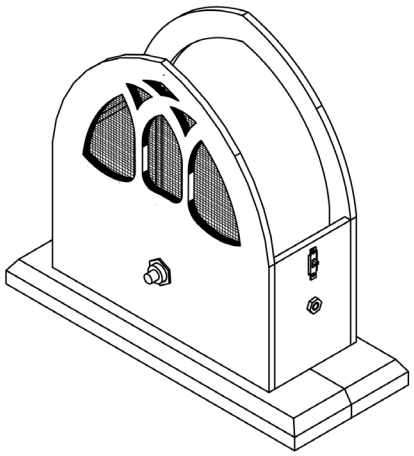


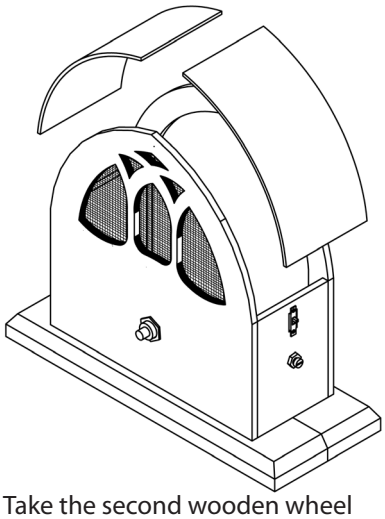
INSTRUCTIONS

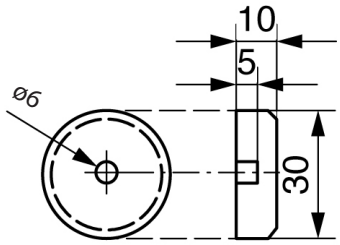
10. Glue the housing centrally on the pre-glued base

11. Cut two 130mm long pieces from the modelling plywood (3) and glue them on the housing as shown

12. Take the wheel (4) and on non milled side drill a blind hole 6mm dia 5mm deep



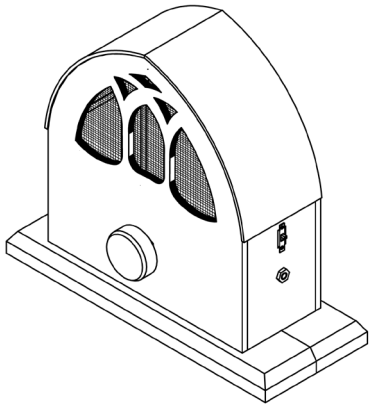


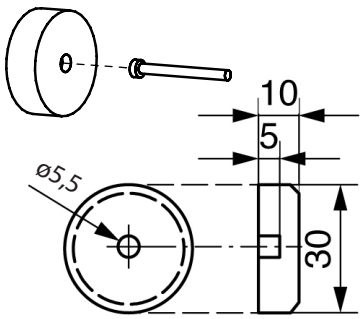


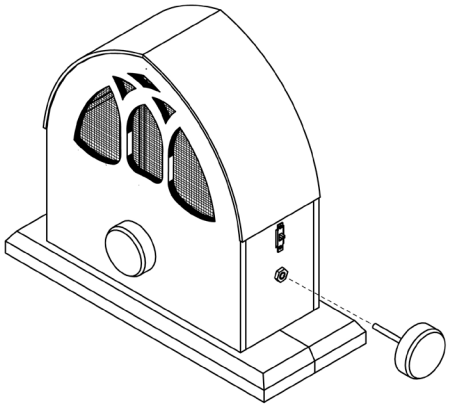
13. Set the wooden wheel (4) on the potentiometer (15) and glue in place (Hot glue gun) See diagram !

14. Take the second wooden wheel (4) on opposte sto the milled side drill a blind hole ø 5,5 mm by 5mm deep. Glue the head of the machine screw (27) in the hole with hot glue

15. Take the wooden wheel with the machine screw (4/27) and screw it into the nut on the side (28)



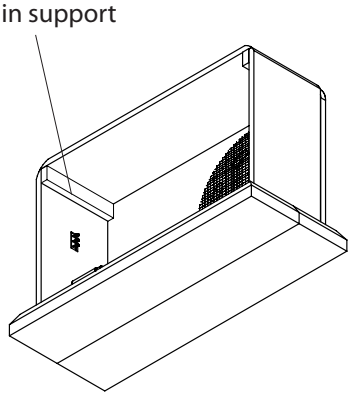


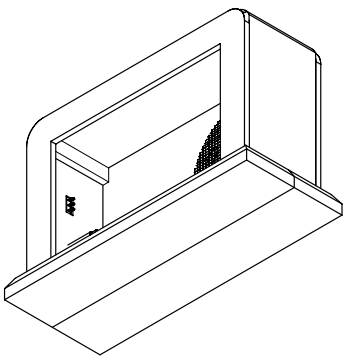


Note:

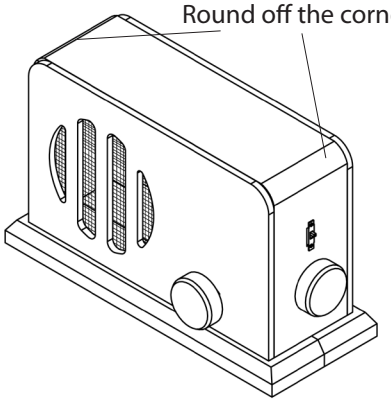
In the second version glue the 2 supports 55x10x5 for the top (see diagram) Once its all dry the top corners can be rounded

Glue in support





Round off the corners



16. Place the plastic (7) tube from the inside in the hole of the nut (28) use instant glue or hot glue gun. To fix the M3 machine screw(27) outside use a nut.

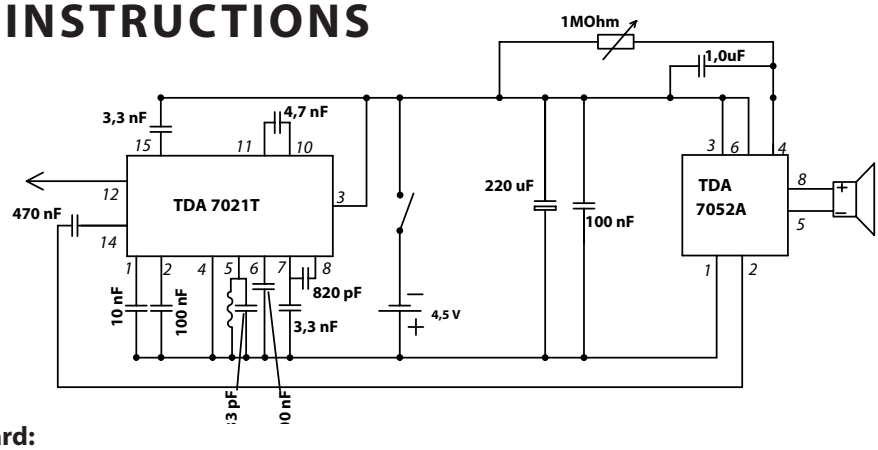
Note . no glue should creep on to the screw thread !

17. The finished housing is ready for painting . We recommend using acrylic paints or varnish!

E110732#1

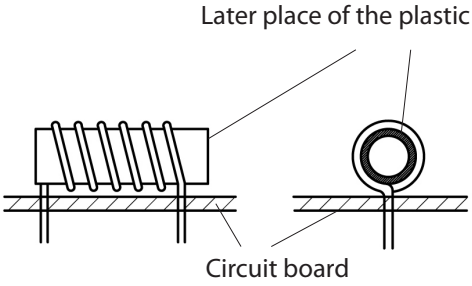
INSTRUCTIONS

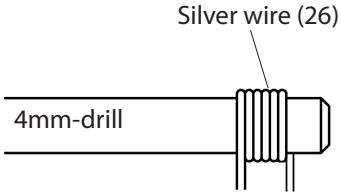
Schematic diagram



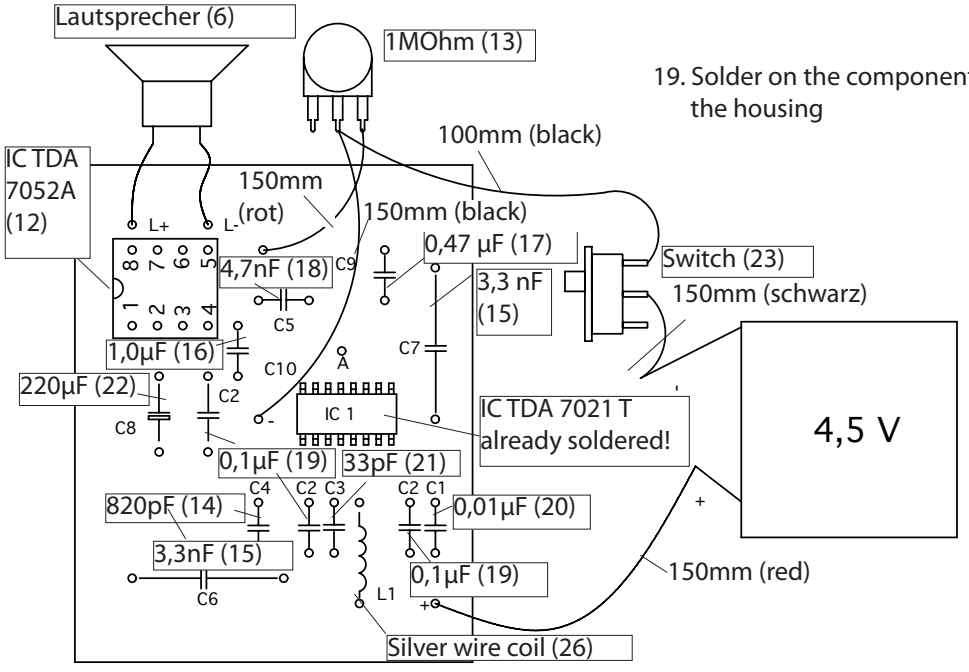
Soldering the components on the circuit board:

18. Use a 4mm drill as a former to wind 6 turns of siver wire close together (See diagram.) Bend the end of the colil as shown Pull the ends of coil carefully apart so that it can be soldered on the circuit board as shown. Place it so that the coil does not lay on the boards but a litte above. Solder in place. Trim the ends under the board



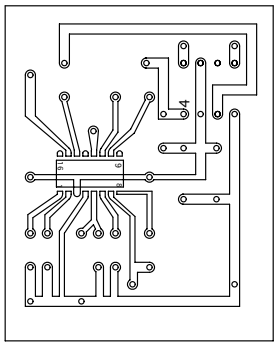


Circuit (top view):



19. Solder on the components as shown and insert the board into the housing

Cicuit board from underneath



Placing and soldering the components on the circuit board

The circuit board has two distinct sides : The top is drilled and printed - the underneath shows all the tracks where the components are soldered.

The IC holder (8) as shown on the top circuit board diagram, the holder
is placed on the top and soldered underneath NOTE the holder has a notch at one end this must be inserted as shown . This ensures that the IC when inserted is the correct way around.

- The amplifier IC (12) is the last component to be inserted otherwise it could be damaged by soldering.
- Insert the capcaitors C1, C2, C3, C4, C5, C6, C7, C9, C10 from the top and lightly bend the legs ten solder them to the underneath of the board

Check them once once that they are in the corret place. Finally trim off the component legs protruding under the board with side cutters

Then add the eletrolyte capacitors C8, 220 µF (22) The difference with these CAPACITORS is that they have a POLARITY and must be inserted the correct way around. The MINUS of the capacitor is marked on the circuit board.

INSTRUCTIONS

- Take the cable from the loudspeakers (each ca. 150mm red + black) stripthe insulation from the ends. Twist the inners together and tin them with solder. The red cable from the plus on the loudspeaker is connected and soldered to the Red L+ on the board. The black cable is soldered to the L-minus on the board.
- Trim Ca. 150mm from the black cable and remove the insulation from both ends. Solder it to the middle connection on the potentiometer (13) The other end is soldered to the Minus on the board. Cut another piece, from the black cable ca. 100mm long, strip and tin the ends. Solder it to an outer connection on the potentiometer(13) and the other end to the middle connection on the switch (23). Take about 150 from the red cable, strip the insulation from the ends. an solder it to an outer connection on the potentiometer (13) Connect the other end to the circuit board. (unmarked connection). Solder the minus cable-see diagram of balck cable 150mm to the outer connection on the switch (28) Solder ca. 150mm long piece of cable ,and connect it to the +- on the circuit board. Srtip and tin the the ends of the remaining black cable and solder t as an aerial to the board (A).
- Use the flat conncters (27) on the battery connection wires and solder them to the plus -minus on the circuit board.
- The following checks should be made to avoid any damage to the components on the board.

Ensure that there is no excess solder making connections where theshould not be (See circuit diagram)
Make sure that all the components are in their correct place (see circuit diagram) Make sure that their values are correct ?

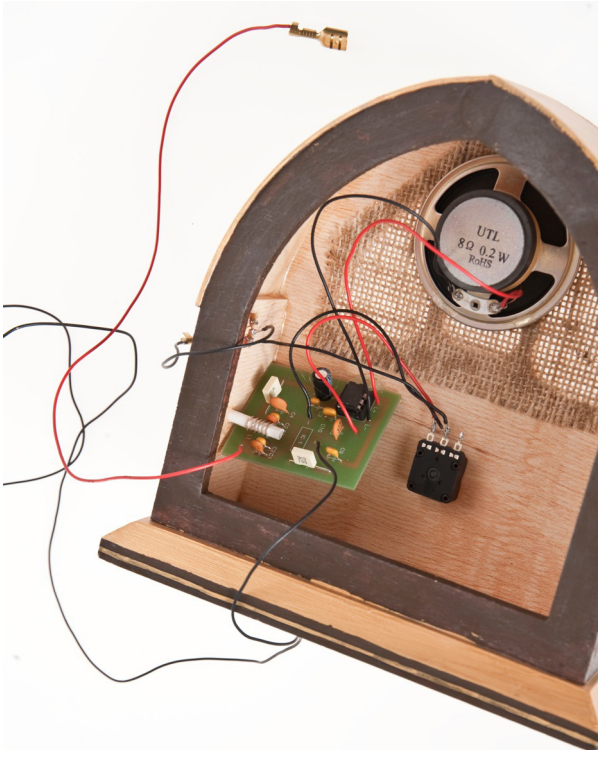
- Erst wenn diese Arbeit durchgeführt ist kann der IC (12) seitenrichtig in die IC-Fassung eingesetzt werden. Dabei ist darauf zu achten, dass alle Beine in der Fassung stecken.
- Adjust the potentiometer to the middle position (mddle volume.
- Now connect a new 4.5volt battery. You will either hear a nose or receive a program .
- If this doesn#t work go through all te checks as above once more .
- If you hear a noise, you can widen the coil a little until you recive a staion. At least you can see that it is working corretly or not

To receive diffrent stations is hard and patient work to adjust, you do this by screwing in the centre of the coil. The plastic tube stops the direct contact with the coil

Fianl assembly

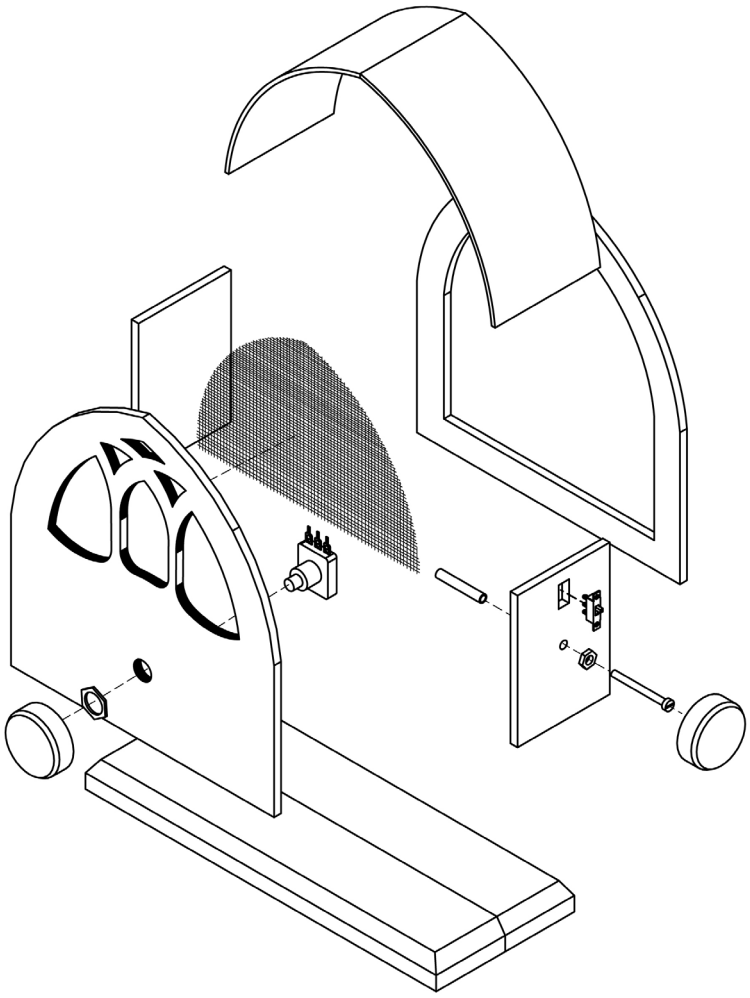
- Mount and glue the loudspeaker to the wooden frame behind the jute materail.Use a hotglue gun or 2 part glue.
- To fit the crcuit in the housing : Slide the coil over the platic tube. Then turn the circuit board so thta it lies on the front and side part of the hosing

Testthe radio works once more. Glue the circuit board in the front part of the housing

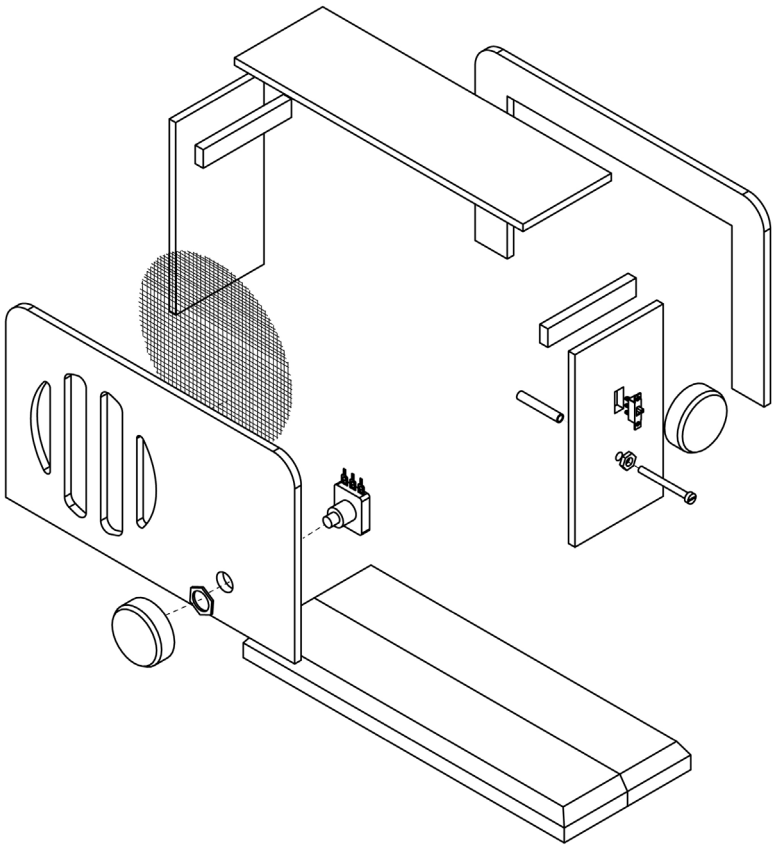


BAUANLEITUNG

Expoded diagram
Variantion 1

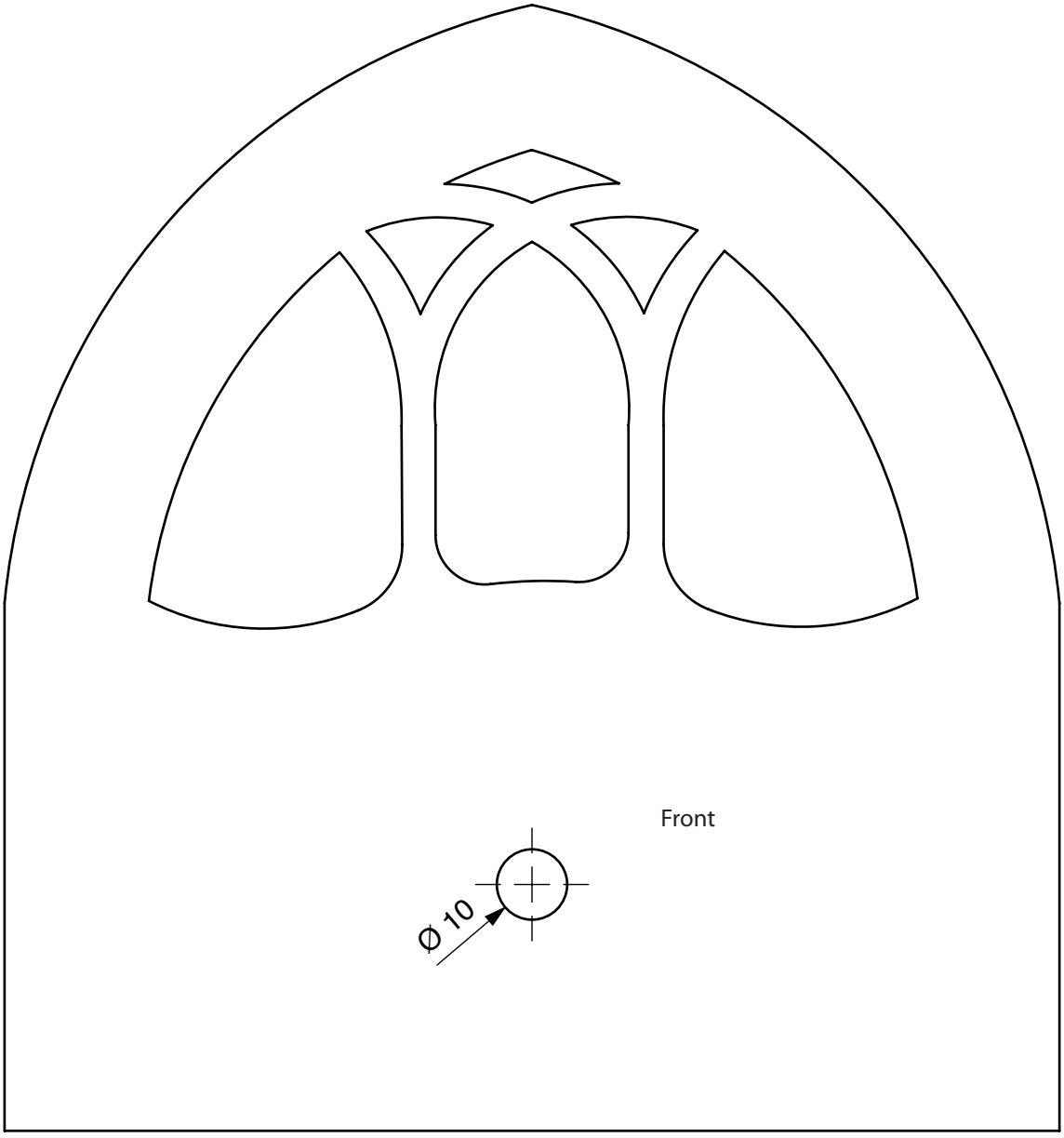


Exploded diagram
Variantion 2



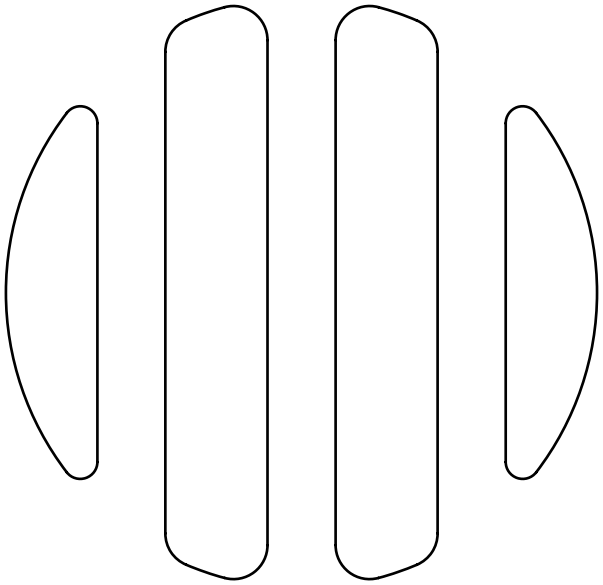
INSTRUCTIONS

Pattern variation 1
Sale 1:1

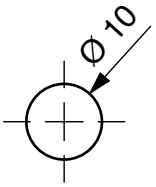


INSTRUCTIONS

Pattern Variation 2
Scale 1:1



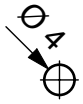
Front



Back part

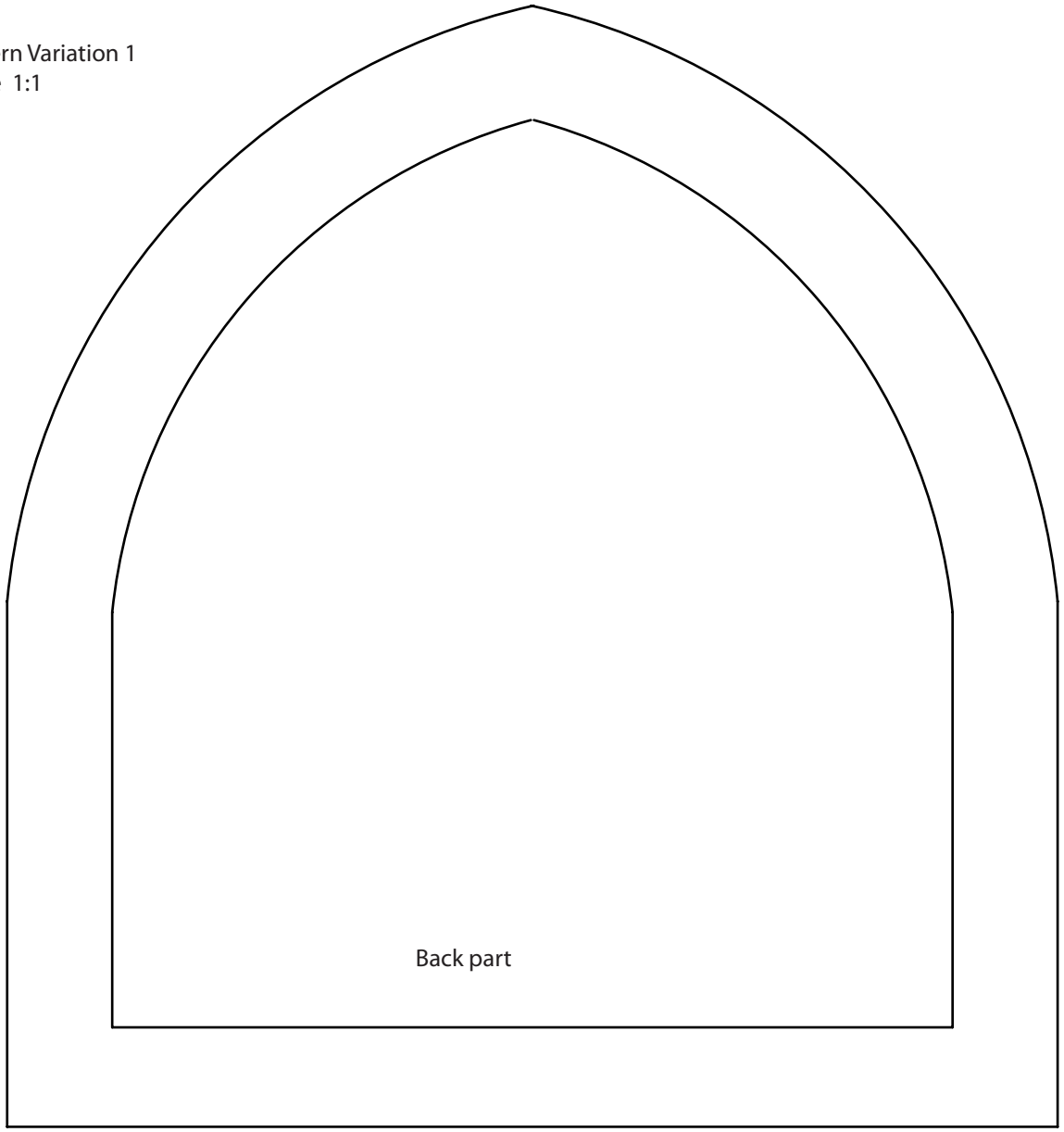
Side part

Side part

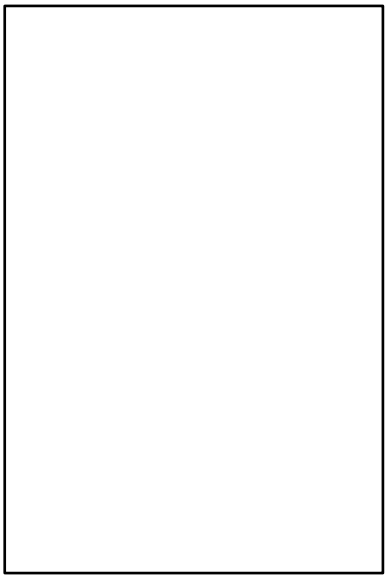


INSTRUCTIONS

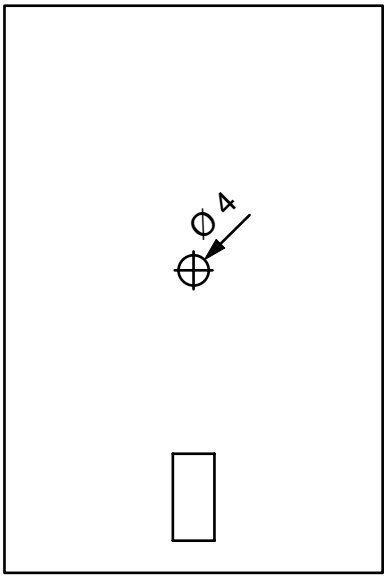
Pattern Variation 1
Scale 1:1



Side part

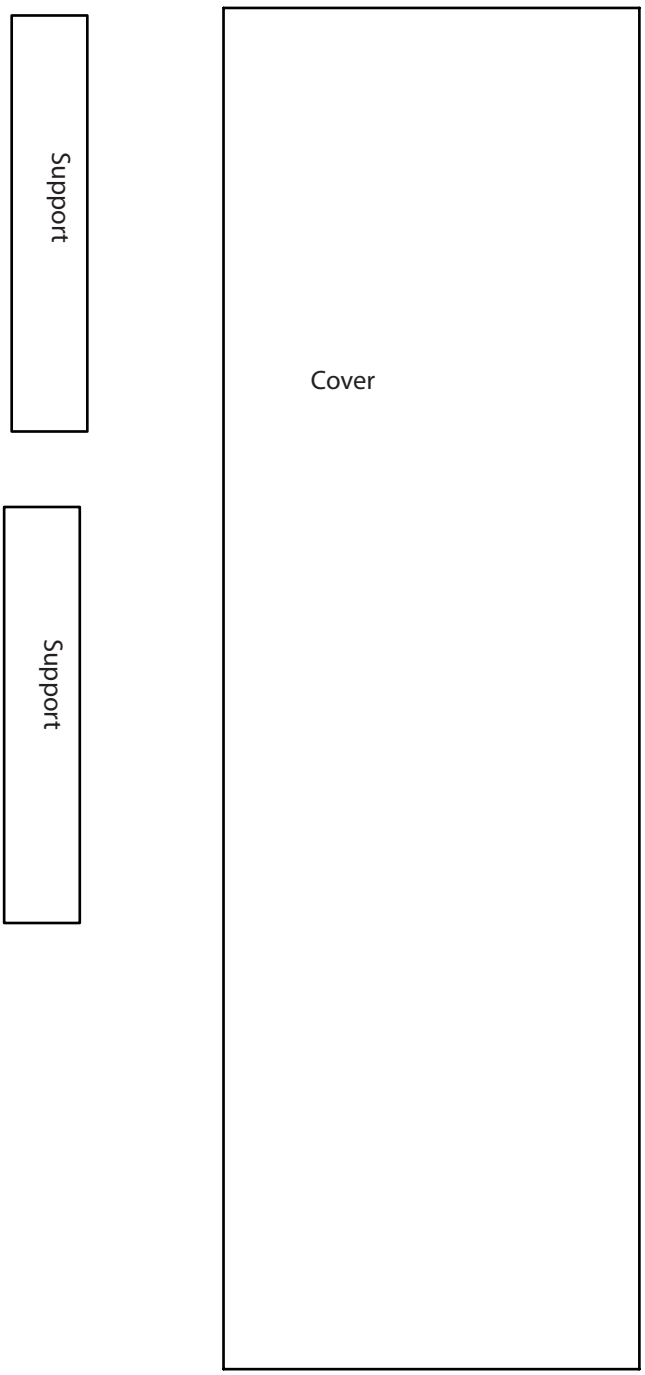


Side part



INSTRUCTIONS

Pattern Variation 2
Scale 1:1



INSTRUCTIONS

Cutting plan Varaition 1+2