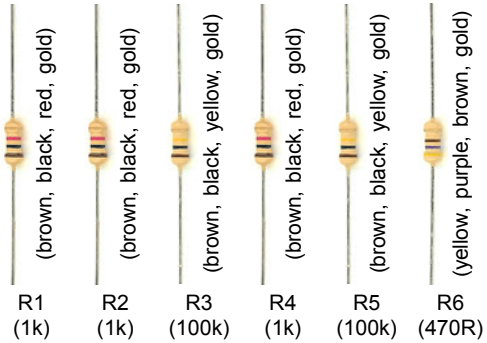
The Electric Telegraph

practise Morse Code then send secret messages

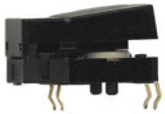


R1 (1k) R2 (1k) R3 (100k) R4 (1k) R5 (100k) R6 (470R)

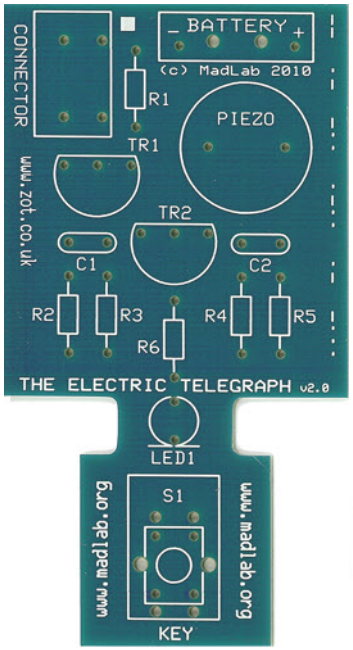
C1 (4n7) C2 (4n7)

Battery snap

PIEZO

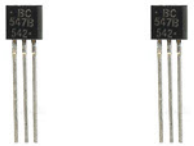


S1



Circuit board

LED1 (red)



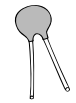
TR1 (BC547/8/9) TR2 (BC547/8/9)

Terminal block

1. Identify the different components using the spotter chart.

2. Find the resistors (R1 to R6) telling them apart by the coloured bands around their bodies. Bend the legs into a U-shape then fit them flat onto the picture side of the circuit board. Bend the legs outwards into a V-shape to hold them in place. They can be fitted either way around.

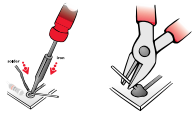
3. Fit the capacitors (C1 and C2) to the board either way around. Bend the legs outwards to hold them in place.



4. Fit the light (LED1) to the board putting the shorter leg into the hole with the line. The shorter leg also has a flattened edge on the rim. Bend the legs away from each other.

5. Open the legs of the transistors (TR1 and TR2) a little and fit them to the board matching the half-circle shape of the transistor to the half-circle shape on the board. Push the transistors half way down and bend their legs.

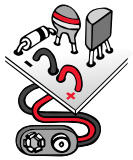
6. Solder the legs of all the components to the metal side of the board then clip the legs close to each solder joint.



7. Solder the speaker (PIEZO) to the board either way around and clip its legs.

8. Solder the terminal block (CONNECTOR) to the board within the marked outline such that the orange levers are on the inside.

9. Solder the keyswitch (S1) such that it fits within the marked rectangle.



10. Push the battery snap leads up through the larger holes in the board from the metal side of the board. Fit the metal tip of the red lead into the BATTERY + hole and the metal tip of the black lead into the BATTERY – hole. Solder the metal tips to the tracks on the board then pull the wire loops back.

11. Connect a battery **(9V PP3)** to the battery snap. Press the keyswitch and a beep should sound and the LED should light.

12. You can connect two *Electric Telegraphs* together and send messages between them. Use twin-core wire or two individual wires. Depress the orange levers of the terminal block and push the wires into the holes. Connect like to like, i.e. the two holes marked with a small rectangle together. (If you connect the wires the other way around a continuous beep will sound.) Pressing the keyswitch on either *Electric Telegraph* will then sound a beep simultaneously on both.

© MadLab® 2016

Morse Code Alphabet

A	•-	N	-•	0	-----
B	-•••	O	---	1	•----
C	-•-•	P	•--•	2	••---
D	-••	Q	--•-	3	•••--
E	•	R	•-•	4	••••-
F	••-•	S	•••	5	•••••
G	--•	T	-	6	-••••
H	••••	U	••-	7	--•••
I	••	V	•••-	8	---••
J	•---	W	•--	9	----•
K	-•-	X	-••-	.	•-•-•-
L	•-••	Y	-•--	,	--••--
M	--	Z	--••	?	••--••