



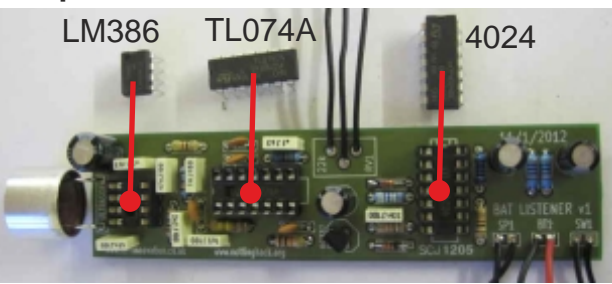
# BAT LISTENER KIT

## Instructions

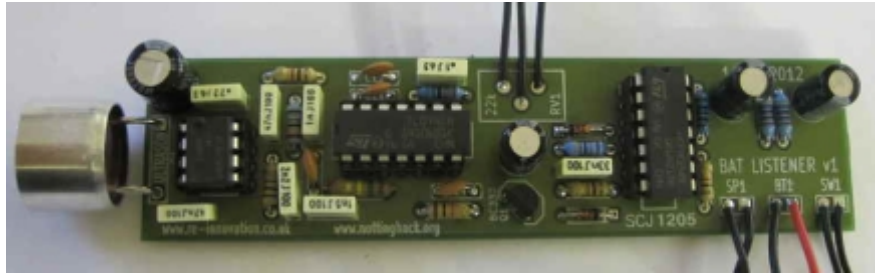


Bats use ultra-sonic pulses to navigate and to detect prey. These pulses are very high pitch (around 5 times the maximum frequency humans can hear). This electronic circuit converts the high pitched sounds produced by bats to a human-audible level. This device can be tuned to different frequencies of different species of bat. It can also be used to listen to other high frequencies such as peeling sticky tape, compact fluorescent lights and power supplies.

### Step 8: Insert ICs into Sockets



Ensure IC orientation correct - check the notch.

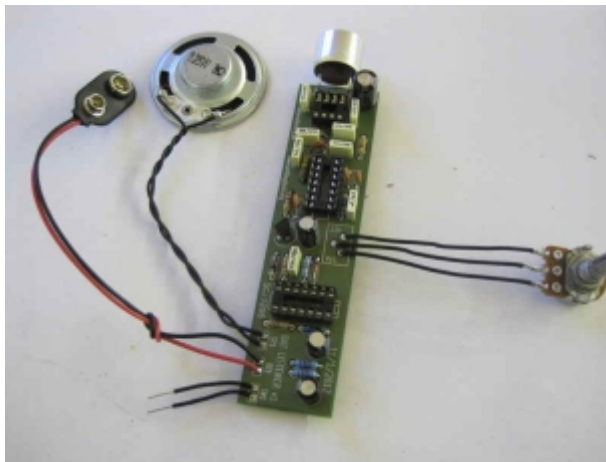


### Step 9: Add a battery and test.

This circuit uses a 9V PP3 type battery. Connect the battery and switch on.

You may hear a squeal from the device. Adjust potentiometer until you do not hear any noise. Use a reel of sticky tape to test. Slowly peel the tape off the reel and you should hear crackles from the speaker. This is picking up high frequency sound from the glue breaking.

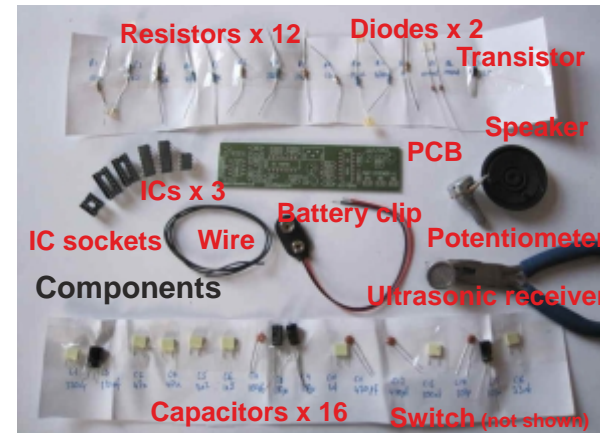
You can also test by pointing at a compact fluorescent light bulb. These switch at around 100kHz and hence give off ultrasonic noise.



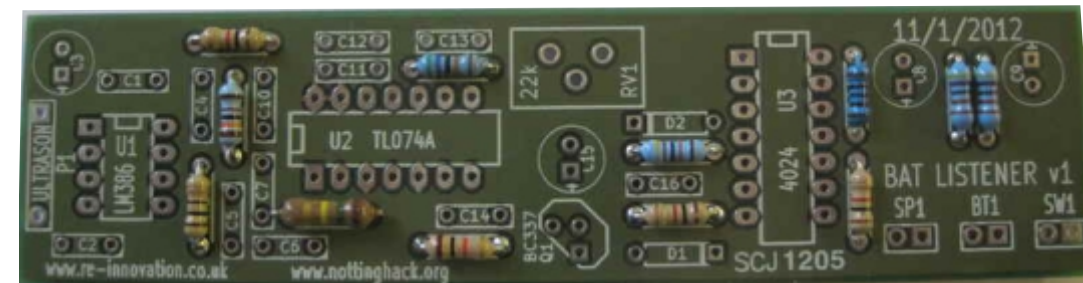
Fit the device into an enclosure of your liking (it is designed to fit within a short piece of 40mm waste water pipe with push-fit end fittings).

### Step 10: Finished! Go and listen to some bats....

This kit is based upon a circuit originally published by Elektor Electronics: <http://www.elektor.com/magazines/2011/november/simple-bat-detector.1971945.lynxk>  
Kit developed by Matt Little: [www.re-innovation.co.uk](http://www.re-innovation.co.uk)  
for Nottingham Hackspace: [www.nottinghack.org.uk](http://www.nottinghack.org.uk)

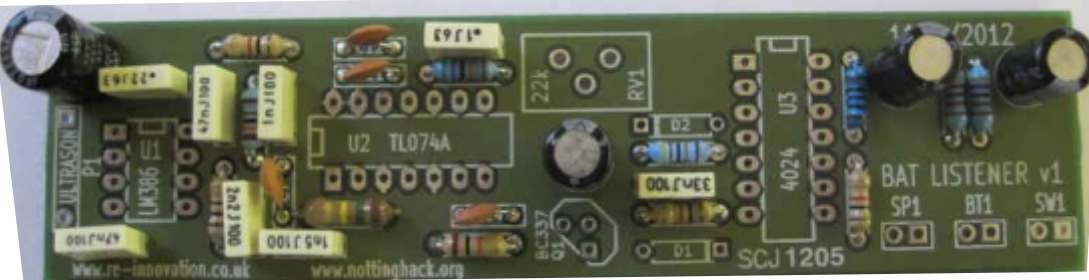


### Step 1: Solder the resistors



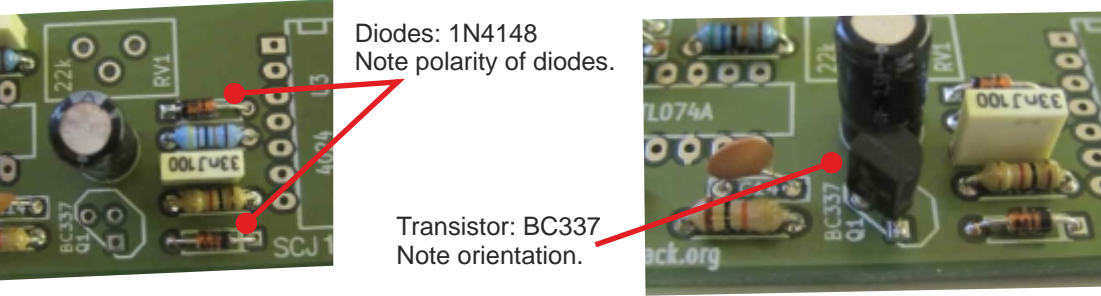
R1 10		R5 47k		R9 1k	
R2 1k3		R6 1k		R10 100	
R3 150k		R7 560k		R11 470k	
R4 47k		R8 10k		R12 1k	

**Step 2: Solder the capacitors**



- |         |  |         |  |          |  |
|---------|--|---------|--|----------|--|
| C1 220n |  | C6 1n5  |  | C11 470p |  |
| C2 47n  |  | C7 100p |  | C12 470p |  |
| C3 220u |  | C8 100u |  | C13 100n |  |
| C4 47n  |  | C9 100u |  | C14 100p |  |
| C5 2n2  |  | C10 1n  |  | C15 100u |  |
|         |  | C16 33n |  |          |  |
- Note: polarity on C3, C8, C9 and C15.*

**Step 3: Solder the diodes and transistor**



**Step 4: Solder the IC sockets**

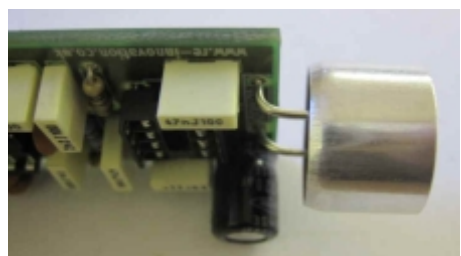


Note notch on IC sockets

**Step 5: Solder the ultrasonic receiver**



Bend legs with pliers



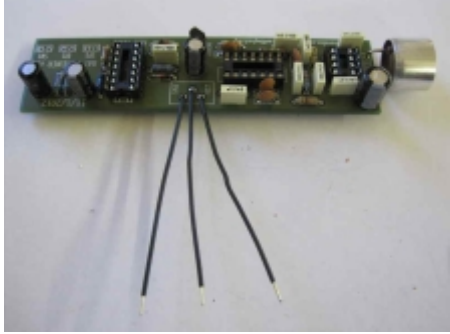
**Step 6: Connect the potentiometer**



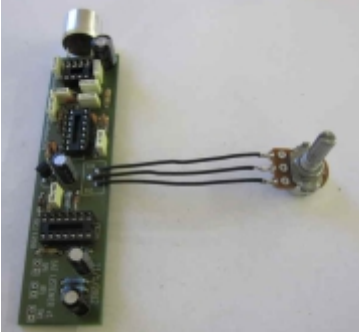
Cut 3x pieces of wire



Strip both ends

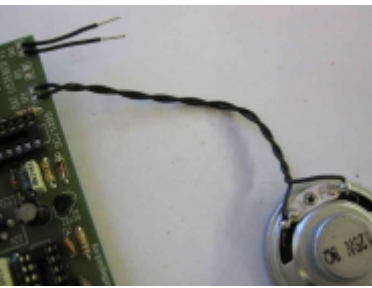


Solder to PCB

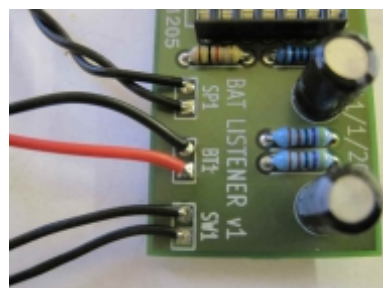


Solder to potentiometer

**Step 7: Solder the speaker, switch and battery clip**



Cut 4 x pieces of wire.  
Strip ends.  
Solder to PCB on SW1 and SP1.  
Solder speaker to SPK.  
Solder switch to SW1.



Solder battery clip to BT1  
Note the polarity.