



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).

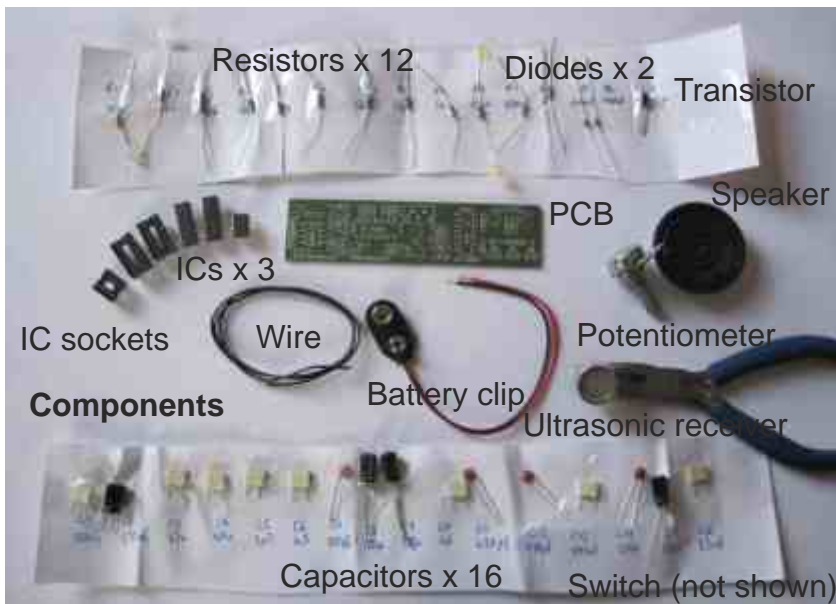
This electronic circuit converts the high pitched sounds produced by bats to a human-audible level. This device can be tuned to different frequencies of different species of bat.

It can also be used to listen to other high frequencies such as peeling sticky tape, compact fluorescent lights and power supplies.

This kit is based upon a circuit originally published by Elektor Electronics:

<http://www.elektor.com/magazines/2011/november/simple-bat-detector.1971945.lynx>

This kit was developed by Matt Little for Nottingham Hackspace: 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		C5 2n2		C9 100u		C13 100n	
C2 47n		C6 1n5		C10 1n		C14 100p	
C3 220u		C7 100p		C11 470p		C15 100u	
C4 47n		C8 100u		C12 470p		C16 33n	

Note polarity on C3, C8, C9 and C15.

Step 3: Solder the diodes and transistor



Diodes: 1N4148
Note polarity of diodes.



Transistor: BC337
Note orientation.

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



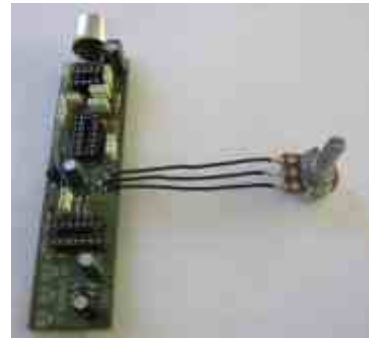
Cut 3x pieces of wire



Strip both ends



Solder to PCB



Solder to potentiometer

Step 7: Solder the speaker, switch and battery clip

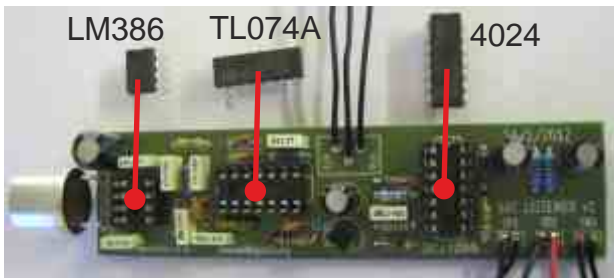


Cut 4 x pieces of wire.
Strip ends.
Solder to PCB on SW1
and SP1.
Solder Speaker to SPK.
Solder switch to SW1.

Solder battery clip to BT1
Note the polarity.



Step 8: Insert ICs into Sockets



LM386

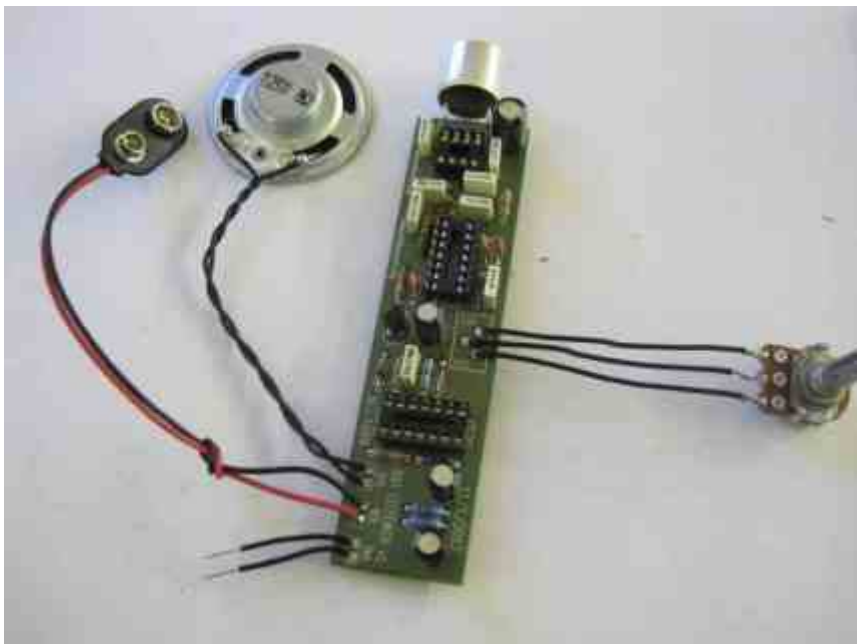
TL074A

4024



Ensure IC orientation correct - check the notch.

Step 9: Add a battery and test.



This circuit uses a 9V PP3 type battery. Apply 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!

Circuit Diagram & Parts List

Ref	Item
BT1	BATTERY Battery Clip
C1	220n
C2	47n
C3	220u
C4	47n
C5	2n2
C6	1n5
C7	100p
C8	100u
C9	100u
C10	1n
C11	470p
C12	470p
C13	100n
C14	100p
C15	100u
C16	33n
D1	1N4148
D2	1N4148
P1	Ultrasonic receiver
Q1	Bc337
R1	10ohm
R2	1k3
R3	150k
R4	47k
R5	47k
R6	1k
R7	560k
R8	10k
R9	1k
R10	100ohm
R11	470k
R12	1k
RV1	22k
SP1	SPEAKER
SW1	SWITCH
U1	LM386
U2	TL074A
U3	4024

