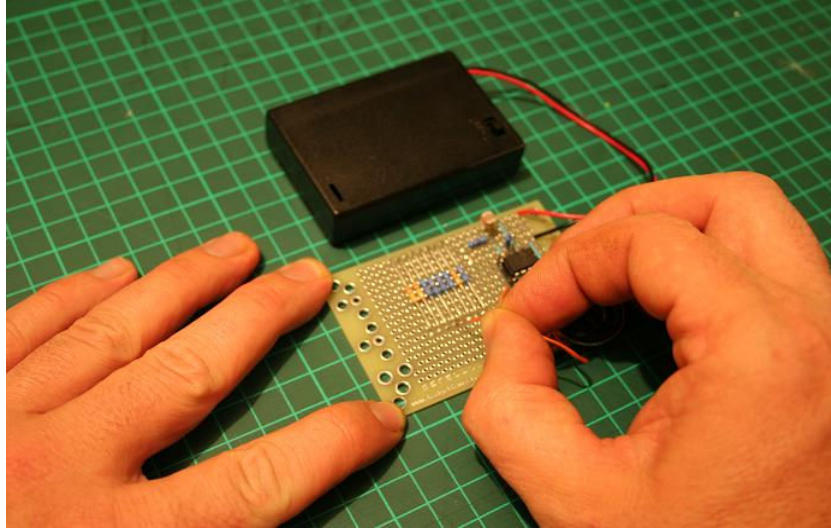


# Howto:

**Howto:** NoiseAxe  
**URL:** <http://www.gadgetgangster/79>  
**Difficulty:** Easy

**Designed By:** Brian McNamara  
**Build Time:** 2.5 Hours

The NoiseAxe is an easy to build Picaxe based mini synth that plays a range of crazy sounds.



## Tools Required:

Soldering iron  
Wire cutters  
Solder

## How to play:

The NoiseAxe will play 8 different notes, each note is played by touching one of the 8 resistor legs at the bottom right of the PCB with the stylus wire. You can change the level of modulation by varying the light that enters the photoresistor, creating a vibrato effect. This is done by putting your finger over, or shining a small LED torch onto, the photoresistor.

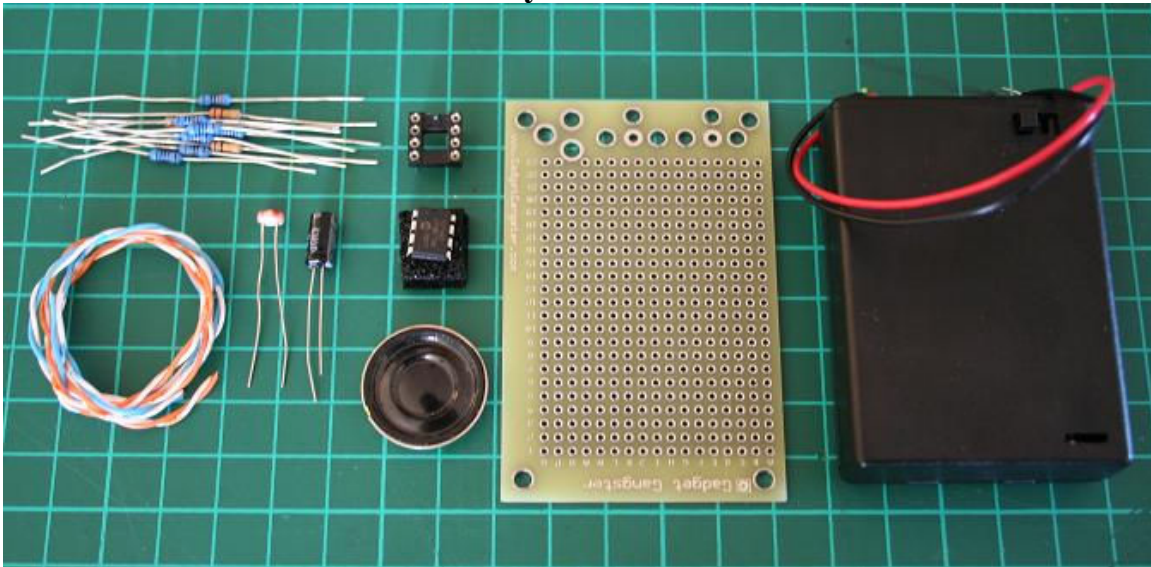
## How it works:

The NoiseAxe is based around the Picaxe 08M micro-controller. The 8 different notes that it will play are controlled via a stylus that you use to touch each of the 8 resistors legs at the bottom right of the PCB. Each resistor makes a voltage divider that produces a different voltage when that resistor is touched. The voltage is sensed by the ADC (analog to digital converter) on the Picaxe and converted into one of 8 values in the program. The 8 note output corresponds to one octave on a keyboard. The sound command is then used to output the correct note to the speaker. The photoresistor is also used in a voltage divider circuit connected to one of the inputs the micro-controllers ADC. A digital value is read within the program and added or subtracted from the frequency sent to the sound command.



# Howto:

## What you will need

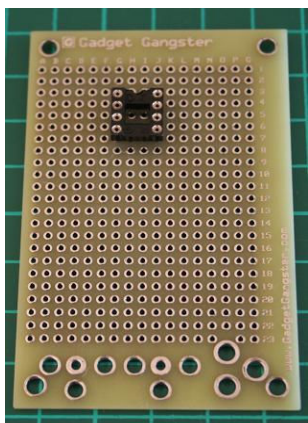


## Bill of materials

Type	Value	Des	Qty
Resistor	330R	R1	1
Resistor	560R	R2	1
Resistor	1K	R3	1
Resistor	2.2K	R4	1
Resistor	3.3K	R5	1
Resistor	10K	R6,R9,R10,R11	4
Resistor	100K	R7	1
Resistor	220K	R8	1
Photoresistor	10K	R12	1
Capacitor	10uF	C1	1
Picaxe	08M	IC1	1
8Pin IC Socket	8Pin	SC1	1
Battery holder	3AA	B1	1
Micro Speaker	8ohm	SP1	1
Project PCB	Half Board	PCB1	1
Hookup Wire	Solid core		~1ft

# Howto:

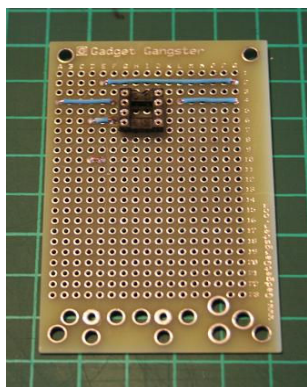
## STEP 1



### IC socket:

Place the 8pin IC Socket on the top side of the PCB, with pin 1 on G4 of the PCB and pin 8 on J4 of the PCB. Solder into place.

## STEP 2

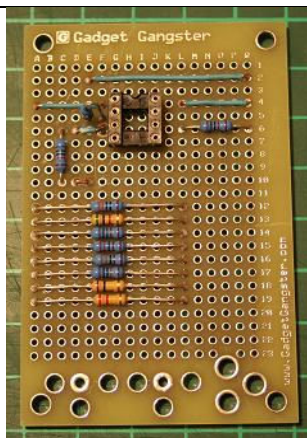


### Wire links:

Solder the wire links to the top side of the board at coordinates:

- E2 to Q2
- L4 to Q4
- A4 to F4
- D6 to F6
- D10 to E10

## STEP 3



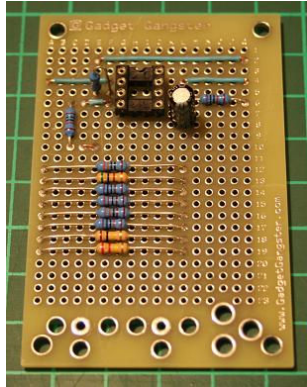
### Resistors:

Place the resistors on the top of the PCB at the following coordinates:

- R1; A12 to L12 330R
- R2; A13 to L13 560R
- R3; A14 to L14 1K
- R4; A15 to L15 2.2K
- R5; A16 to L16 3.3K
- R6; A17 to L17 10K
- R7; A18 to L18 100K
- R8; A19 to L19 220K
- R9; L6 to Q6 10K
- R10; E5 to F5 10K
- R11; C6 to C10 10K

# Howto:

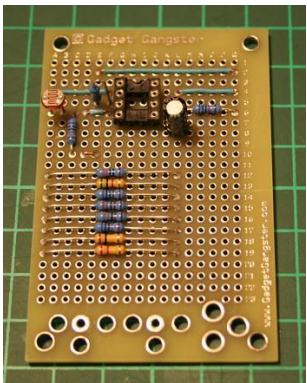
## STEP 4



### **Capacitor:**

Solder the 10uF Capacitor to the top side of the PCB, with the positive leg at L7 and the negative leg at L8.

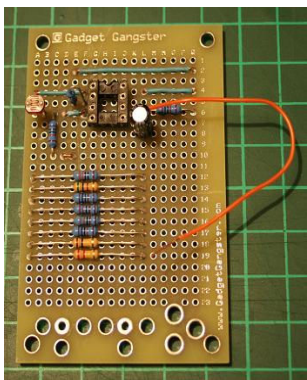
## STEP 5



### **Photoresistor:**

Fit the photoresistor to the top side of the PCB with one leg at A6 and the other at B6. Solder in place.

## STEP 6



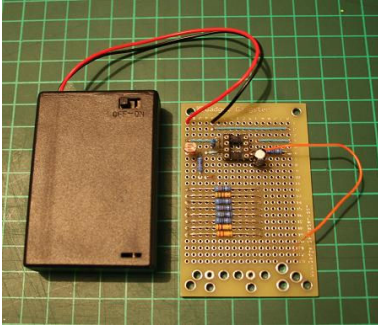
### **Stylus wire:**

Cut about 4" of wire. Strip both ends, and solder one to K6. Leave the other end free.



# Howto:

## STEP 7



### **Battery box:**

Solder the Red wire on the battery box to A1 on the top side of the PCB.

Solder the Black wire to E1 on the top side of the PCB.

## STEP 8

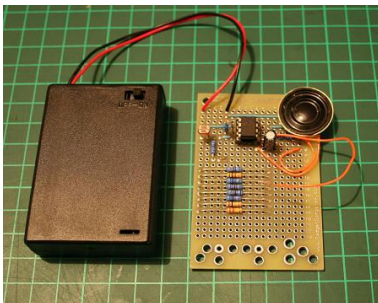


### **Speaker:**

Cut 2 pieces of wire about 2" long, strip both ends and solder one end of each wire to each terminal of the speaker. Solder the two wires to K8 and Q8 on the top side of the PCB.

Bend the wires to place the speaker in the place were you want it.

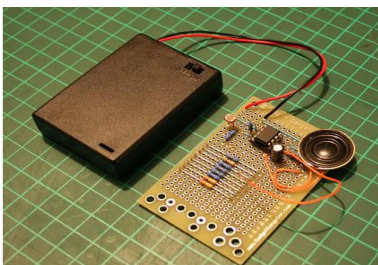
## STEP 9



### **Fit Picaxe:**

Fit the Picaxe 08M to the 8pin IC socket on the PCB.

## STEP 10

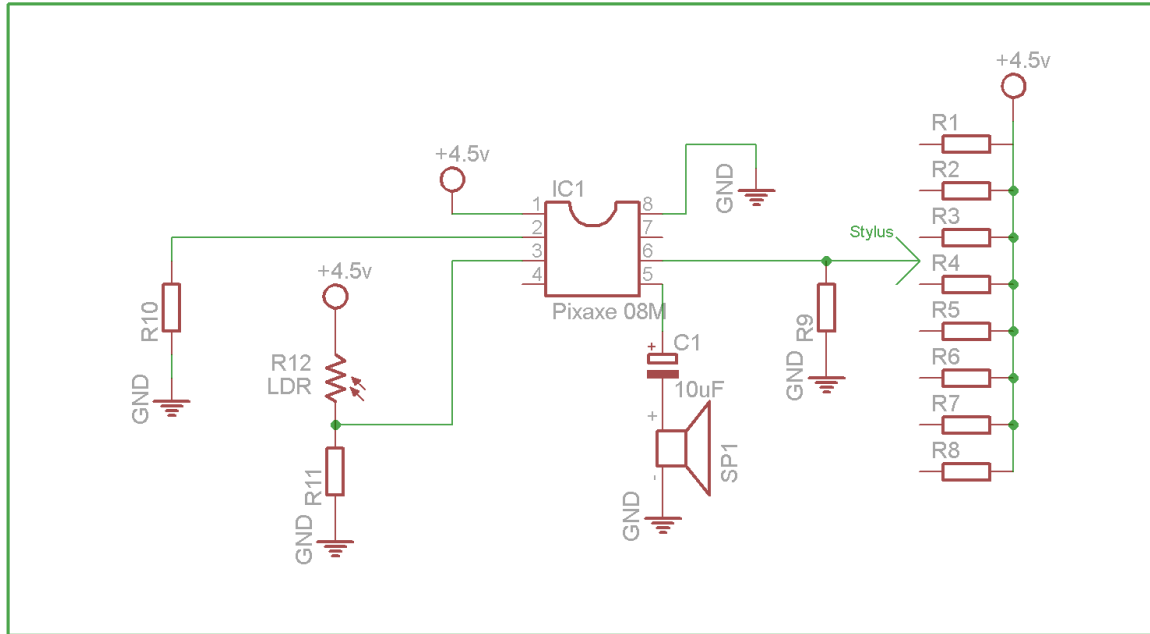


### **Fit batteries and test:**

Fit the 3AA size batteries to the battery box.

Turn the NoiseAxe on and check for sound by placing the stylus on each of the 8 resistor legs that terminate in row L.

# Howto:



NoiseAxe Schematic

