Tic Tac Tunes - Now with Tic Tac Beat Box

by **AndyGadget** on July 2, 2009

Table of Contents

Intro: Tic Tac Tunes - Now with Tic Tac Beat Box

Micro-organ and drum-kit in a Tic Tac box

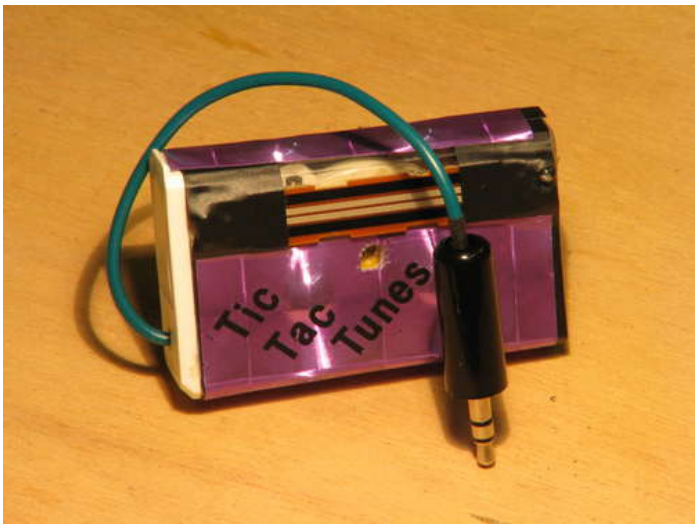
This tiny box will give you hours of fun composing your own tunes. You can vary the tune tempo and switch between a pentatonic and blues scale as well as producing a variety of percussion sounds.
Load up a different program and it will compose its own percussion rhythms(Tic Tac Beat Box) or play with half a dozen different musical scales (Tic Tac Scales).
Another cool feature is no power switch - It will hibernate when it's not being used.

There are great musicians around . . . and then there's me with no musical talent at all, but even I can get some great sounding tunes out of this. Watch the video and have a listen to the MP3 files to get an idea of what this little marvel can do.

UPDATE - Two new programs added - Tic Tac Scales and Tic Tac Beat Box - See step 6
Couple more sound files added (better quality)
Modification for right-handed version added to step 4.

I did mention a kit. This is a pretty fiddly project and it was too difficult to produce a kit which could be successfully constructed by an average purchaser, but I will be picking up this idea again sometime with a larger but higher spec project, probably with a minty flavour to it.

CLICK TO PLAY VIDEO



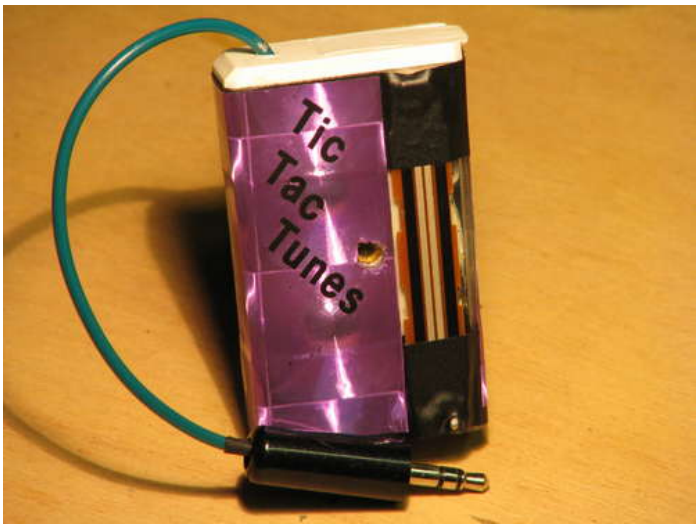


Image Notes
1. That's more like it!
2. Way too big - No challenge at all. I might build an interociter into this one later.

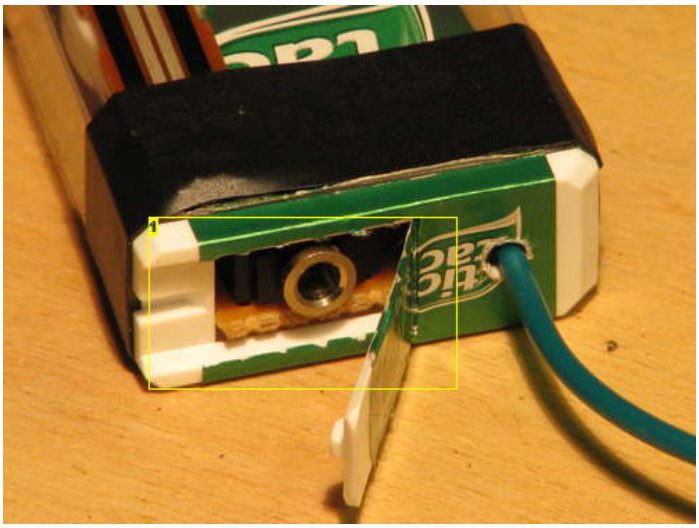


Image Notes
1. Flip up the lid to get to the programming socket

File Downloads

Percussion.mp3 (220 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'Percussion.mp3']

MoreBlues.mp3 (295 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'MoreBlues.mp3']

MinorPentatonic.mp3 (260 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'MinorPentatonic.mp3']

BluesScale.mp3 (189 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'BluesScale.mp3']

GoodBlues.mp3 (170 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'GoodBlues.mp3']

FastBlues.mp3 (120 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'FastBlues.mp3']

BeatBox New.mp3 (990 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'BeatBox New.mp3']

Hungarian.mp3 (247 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'Hungarian.mp3']

Arabic.mp3 (228 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'Arabic.mp3']

Chromatic.mp3 (237 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'Chromatic.mp3']

Step 1: Parts and Tools Required

As well as standard workbench tools and soldering equipment, you will need :-

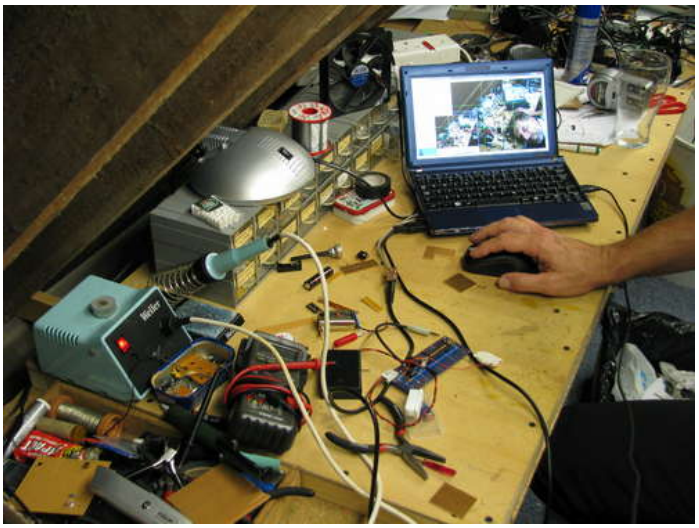
1 x PicAxe 08M microcontroller chip - see below
2 x 10K resistors - all are 1/4 or 1/8 W
1 x 330R resistor
1 x 22K resistor
1 x 560K resistor
1 x red LED
1 x 10K linear dual gang slide potentiometer (60mm).
2 x 1N4148 or similar diodes. Just about any small diode will do
1 x 0.1 uF capacitor (10V or more)
1 x 28mm x 4mm piezo sounder. This MUST be a low profile type or it won't fit
1 x PX28A 6V keyfob battery (4LR44 PX28A A544 L1325 equivalents)
1 x stereo 3.5mm jack socket
1 x jack plug for probe. This can be 2.5 or 3.5mm, mono or stereo
1 x stripboard 22 x 12 holes
1 x spring from a retractable pen
1 packet of TicTacs. Your choice of flavour

You'll also need a few bits of link wire and something to decorate it. I used the old Blue Peter favourite - sticky back plastic.

If you need to brush up on your soldering technique, there's an excellent guide HERE.

Most of my parts came from Maplin (UK), but Mouser or your friendly local on-line electronics store will have these in other parts of the globe. All the parts (including Tic Tacs and battery) shouldn't come to more that 10 pounds (16 dollars), but that may vary depending on where you are, and doesn't include p+p, or the programming lead (see below). The kit I'll be offering (see *update*) will have a pre-programmed chip so you won't need the programming lead.

I've used a PicAxe 08M microcontroller which comes as a blank chip and needs to be programmed. To do this, you will need a programming lead and the free programming editor software. Both the PicAxe chip and the lead are available from Tech Supplies in the UK or see HERE for other countries.
Once you have the lead, you only need a PicAxe, two resistors and whatever sensors and output devices you choose to have a full PicAxe development kit which can program any of the PicAxe range, so you can design your own projects. I have an Instructable planned which will get you well on the way.



Step 2: Making the Circuit Board

Take the 22 x 12 stripboard, mark and cut as shown. To cut stripboard, score it deeply with a craft knife (using a ruler) on both sides. Then use a pair of pliers to very gently flex it. The board should weaken and break. Later on I accidentally broke off the thin leg so substituted a brass pin and used this to connect the -ve battery terminal.

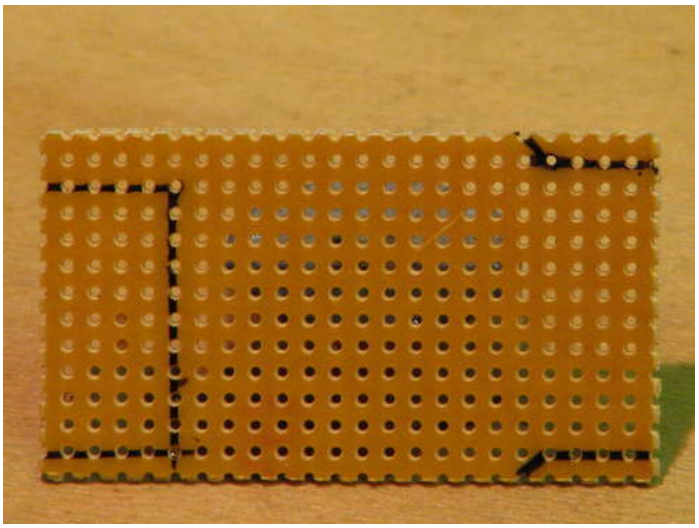
This layout developed as I built it, so look at the front and back photos to get the component and cut track locations. A spot face cutter is the best tool, but failing that, use a handheld 5mm (1/4") drill bit or a craft knife. Make sure no thin bridges of track are left.

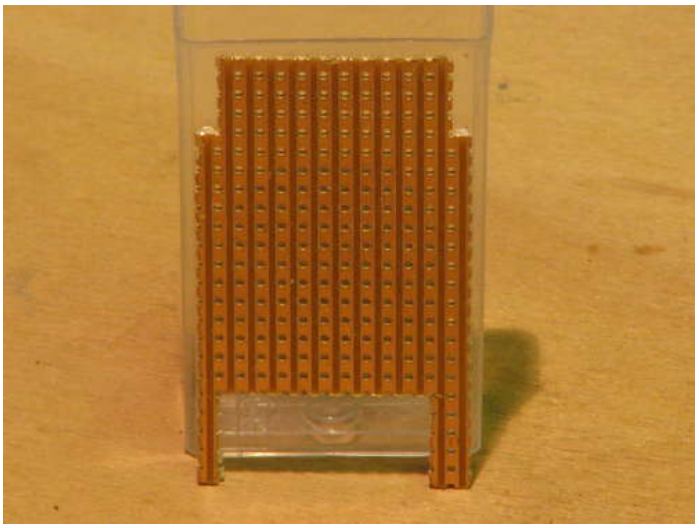
Put in the programming socket and links first, then the resistors and finally the diodes and IC. Normally I'd use an IC socket, but there's no room for such luxuries here - The sounder wouldn't fit! Trim off anything sticking out the back of the board to reduce height. I did say this was tight!

Because we're not using an I.C socket be very careful when soldering the chip. Solder each pin for the shortest possible time to get a good joint, and let the chip cool down between pins.

For the piezo mounting posts I used brass pins from a wire-wrap IC socket, but any stiff solderable wire would do. Use two pieces (approx 8mm) soldered into the board for the posts the piezo sounder will sit on. Once soldered, bulk them out a bit with heat-shrink. Cut 2 lengths from the biro spring so that when you sit the sounder on the posts and slide the PCB into the box, the sounder is sprung against the top.

I've used the 'repair' brass wire to connect another stiff wire to and solder to the -ve of the battery. This holds the battery reasonably firmly in place. The terminals are easy to solder to, but do it quickly so as not to overheat the battery. Leave the wire from the positive terminal unconnected at the moment, until we're ready to put the whole thing together.





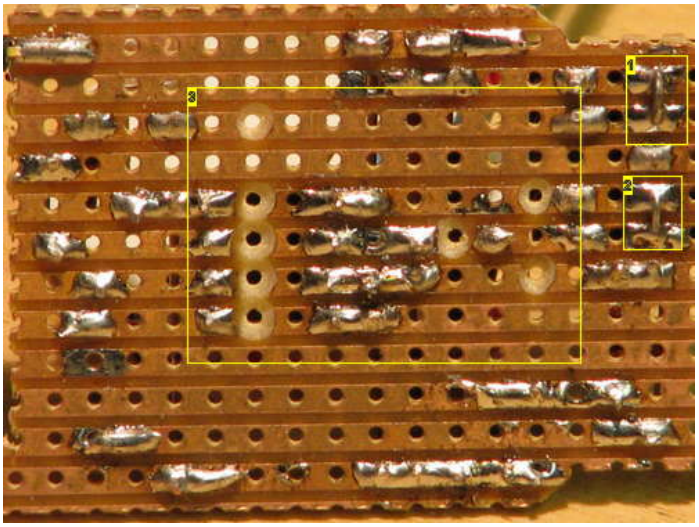


Image Notes
1. Link
2. Link
3. 8 cut tracks

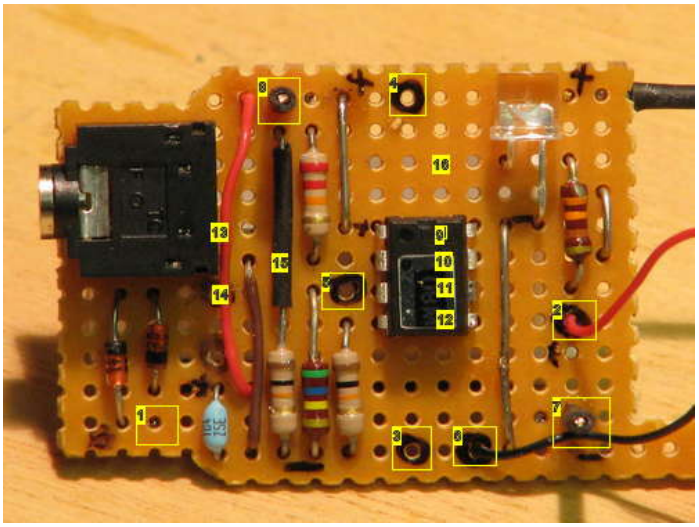
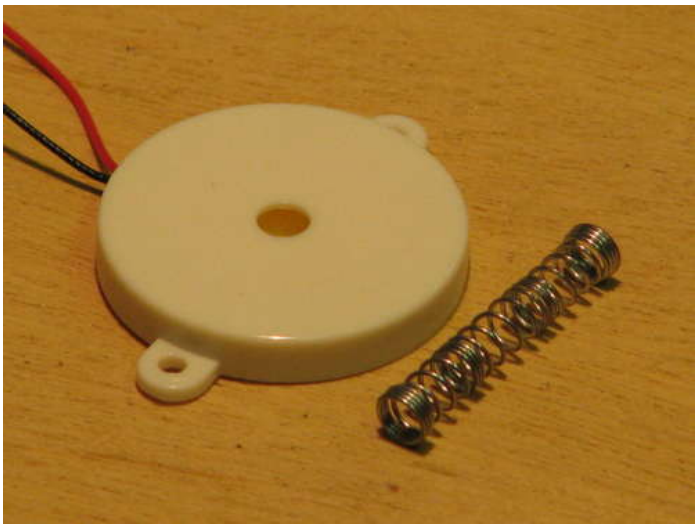


Image Notes
1. Battery +ve
2. Piezo Sounder
3. Keyboard -ve
4. Keyboard +ve
5. Keyboard probe
6. Piezo sounder
7. Piezo mounting post
8. Piezo mounting post
9. Cut track
10. Cut track
11. Cut track
12. Cut track
13. Cut track
14. Cut track
15. Cut track
16. Cut track



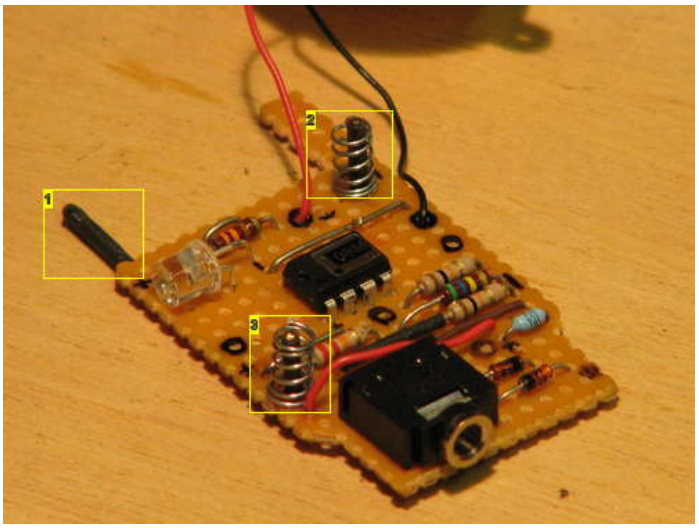


Image Notes
1. Repaired!
2. Piezo mounting post
3. Piezo mounting post

Step 3: Building the 'Keyboard'.

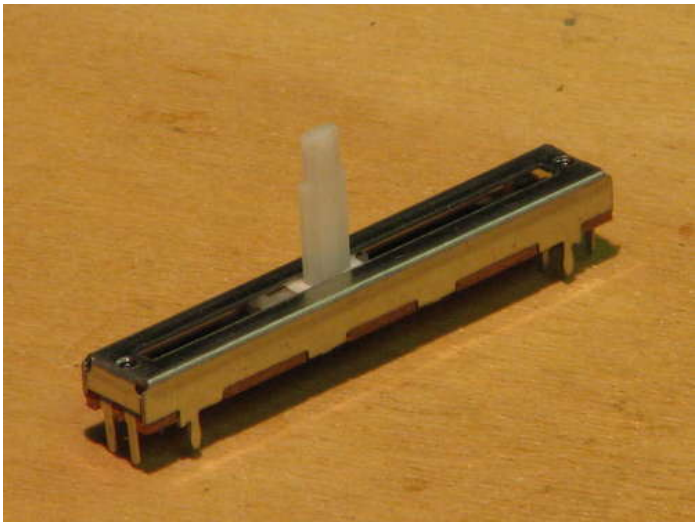
For the keyboard I've used a 10K LINEAR slide dual gang potentiometer. These are the type of thing you'd see on a mixer desk, only smaller. It works in the same way as a normal pot, but in a straight line. Dual gang means there are two of them in the unit (for stereo signals). Linear means the resistance increases evenly across the length.

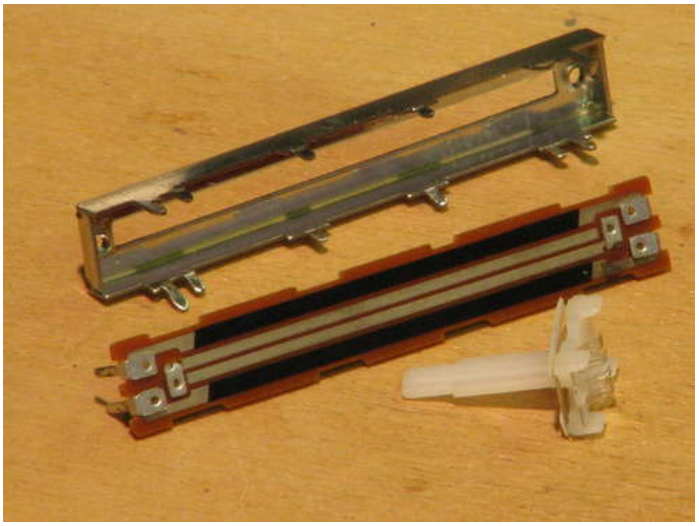
Firstly, bend up the eight lugs and remove the resistive element, then look closely at the third picture and notice the diagonal lines on the element. This is where the resistive part starts and will be significant later.

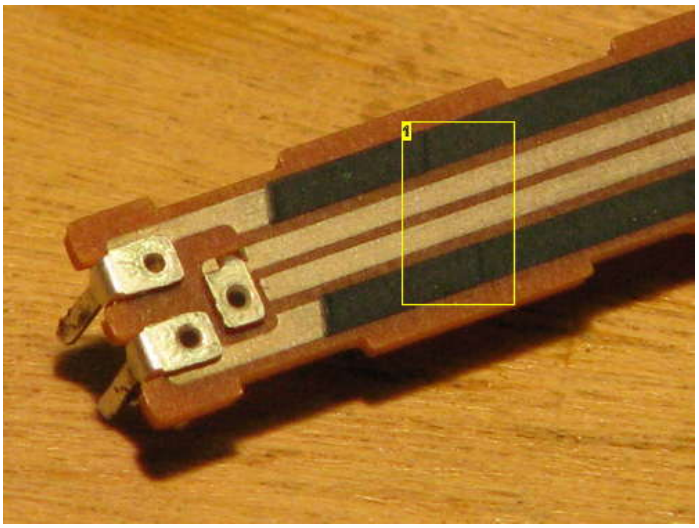
Cut off the six legs, and very carefully cut and grind away the board up to the holes as in the sixth picture. Grind away the through-holes on the back a bit and roughen up the back as we will be gluing this later. Careful here - these things aren't all that rugged and the track is easily scratched.

Fit a link across the holes at one end and thin wires from the two at the other end as in the eighth picture. In the picture, the yellow wire will go to the +ve, the blue to the -ve. Build up a blob of solder on the +ve terminal. This will be the contact for controlling the tempo.

For the probe I'm using just the top pin of a 3.5mm jack plug. Stereo or mono, or 2.5mm would be fine. Use good flexible wire for connecting this. Solder a single wire to the centre terminal and ideally add some heatshrink as strain relief.







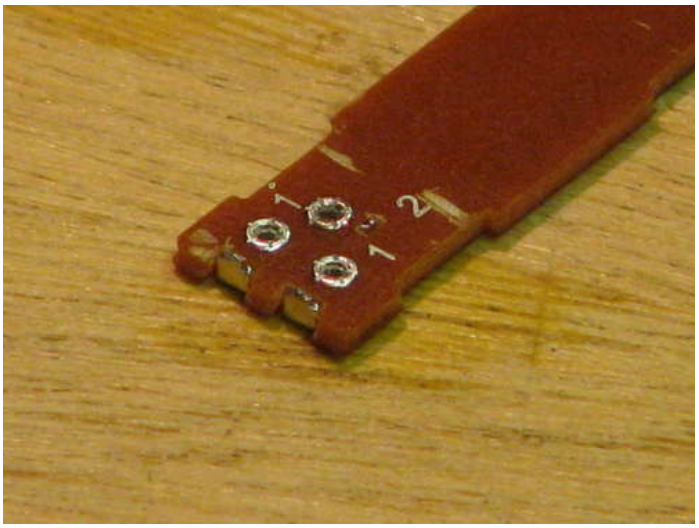
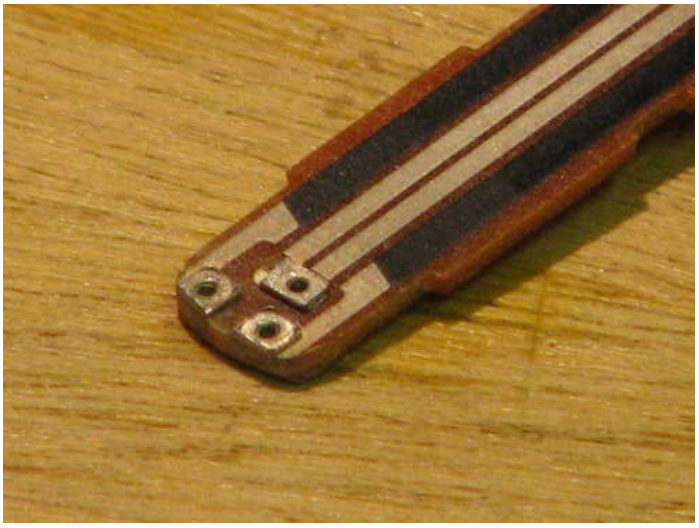
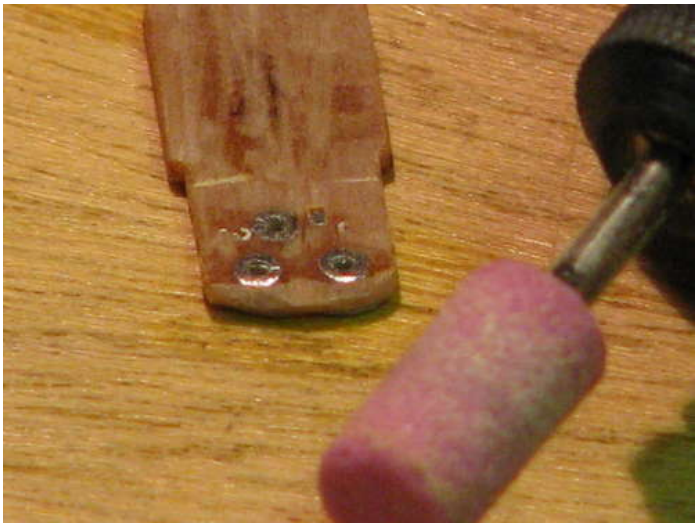


Image Notes
1. Start of the resistive track. Tape crosses here.





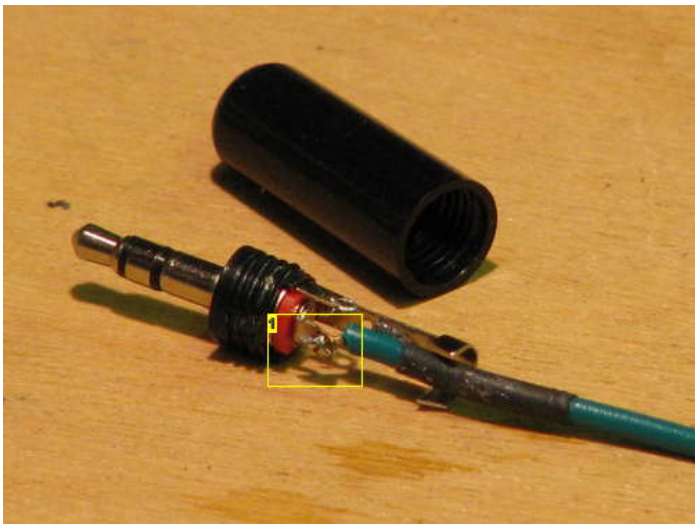
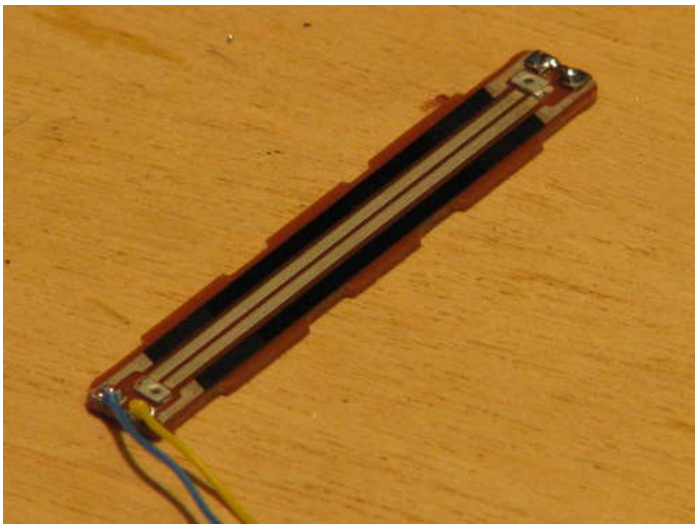


Image Notes
1. Only the centre connection required.



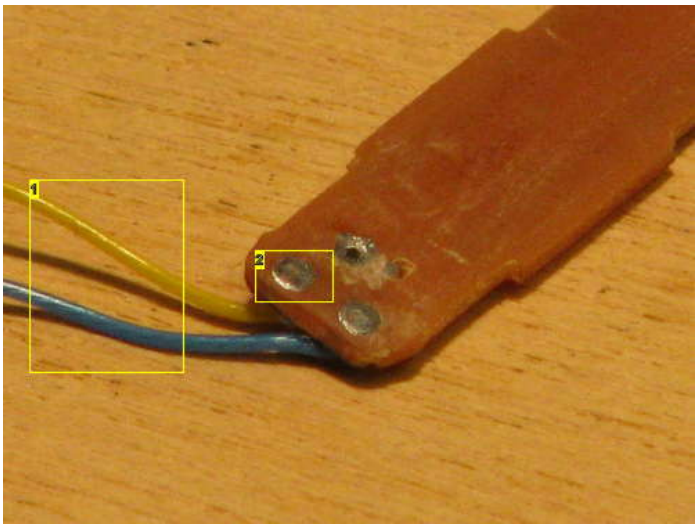


Image Notes
1. Yellow to +ve, blue to -ve.
2. Build up a blob of solder here.

Step 4: Putting It All Together

To position the sound-hole, put the springs on the posts and put the sounder on top. Gently press down and slide the whole assembly into the box then put the lid on. Mark the position of the sounder hole and then remove the circuit and drill a small hole there. A hot soldering iron is great for tidying the edges up. While you're at it, make a hole in the lid of the tic tac box to let the probe lead through. Also make another hole near the base of the box to allow the wires from the keyboard through.

Feed the probe and keyboard wires through into the box and cut these as short as you safely can then solder them to the board. Connect the wire from the battery +ve terminal. The circuit is now live!

Put the sounder in place and feed everything in for the last time. Use a hooked piece of stiff wire to pull the keyboard wires through so they don't foul the battery placement. Take your time over this step.

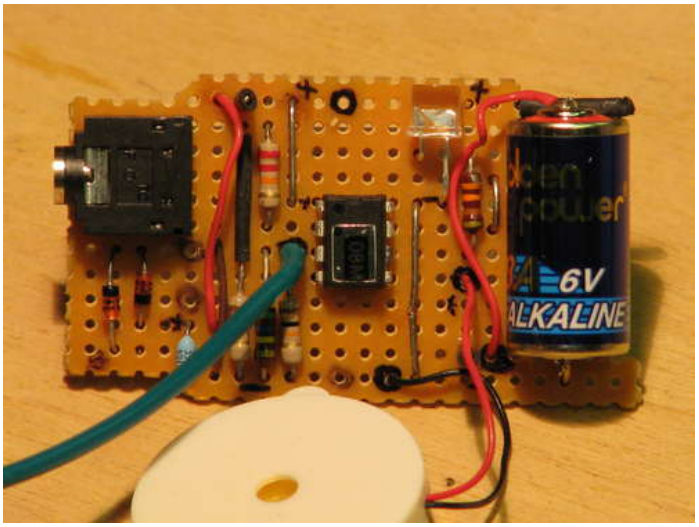
Impact adhesive is about the only thing which will stick the pot base to the plastic box, so give them a thin coat and leave to dry. After 5 minutes or so, carefully stick it down.

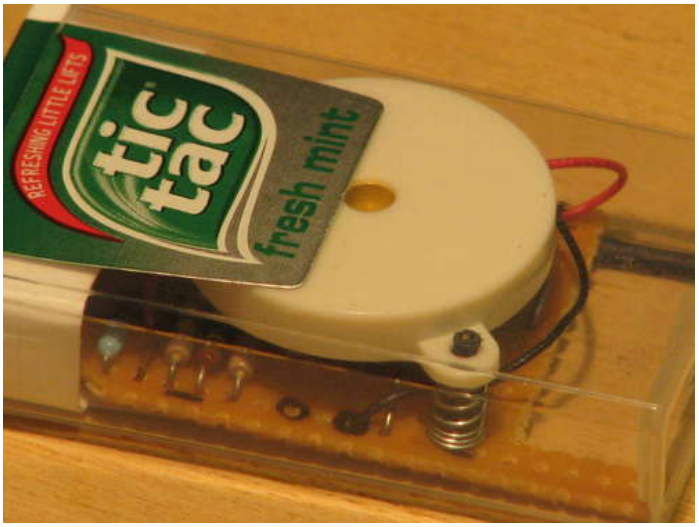
I'm left handed and have made this to suit a left-handed person. For the right-handed version, stick the resistor strip lower down on the panel and turn the unit around when you're playing it.

The insulating tape is important. It has to go around the box and cross the tracks exactly on the diagonal stripe mentioned earlier. This sets the end-points for the keyboard.

Trim away the tape around the solder blob on the keyboard. This is the control button which turns it on, and sets the tempo and scale.

Decorate it in a style of your choosing and clear the sound-hole with your soldering iron tip. I went for the purple holographic sticky vinyl to give a futuristic look but with a retro purple seventies vibe (and because the shop was selling it cheap).





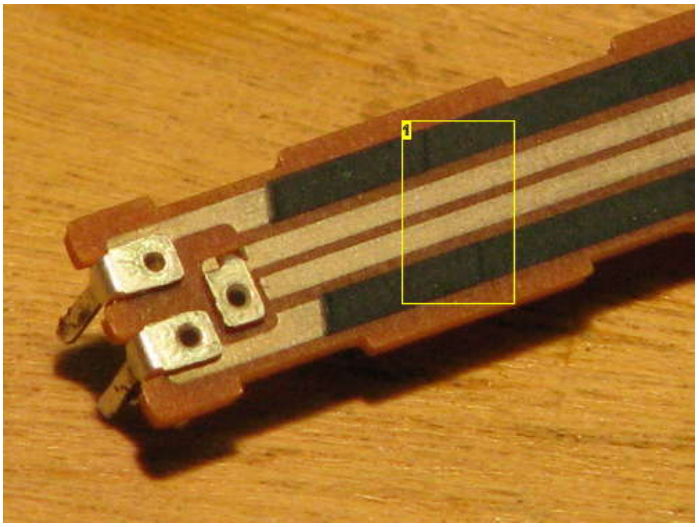
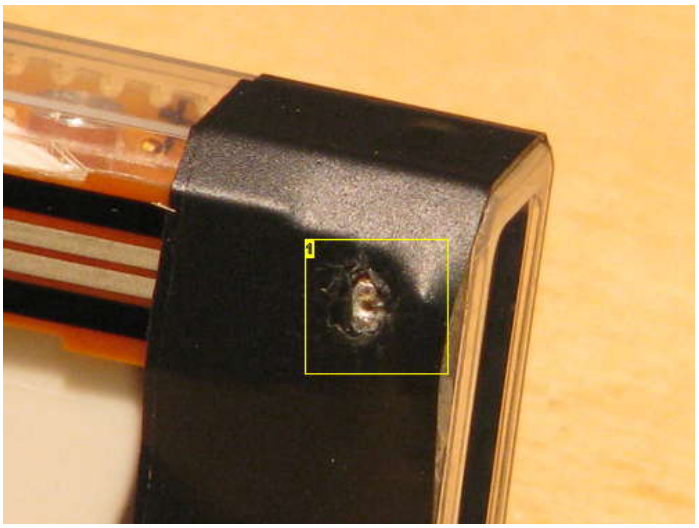


Image Notes
1. Start of the resistive track. Tape crosses here.



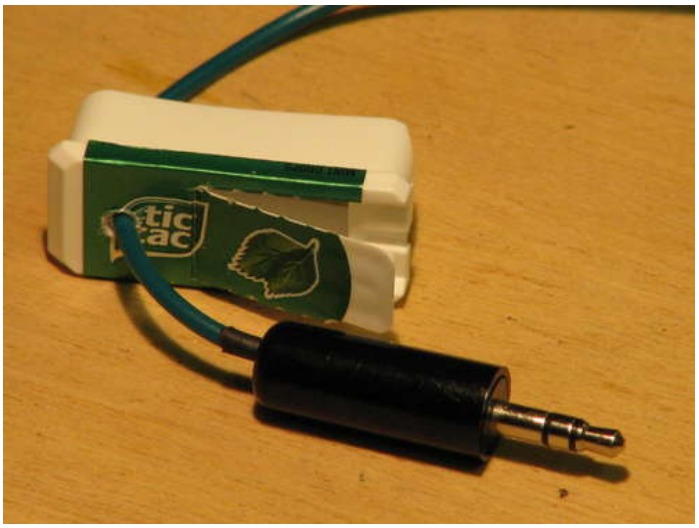


Image Notes
1. This was an earlier version. Build up solder here to make a decent blob.

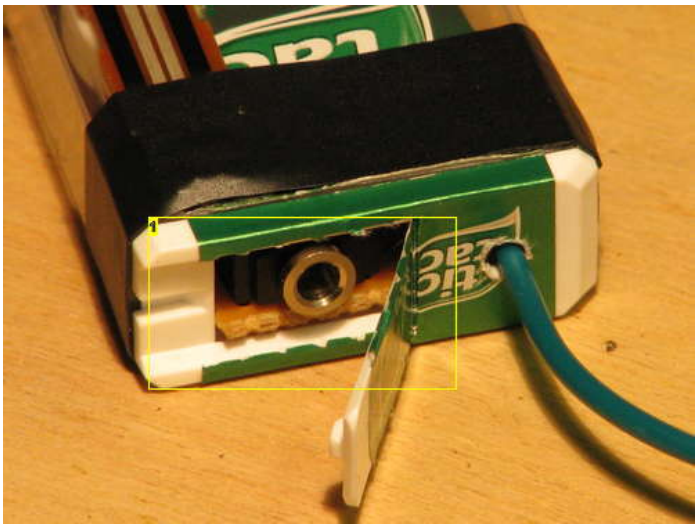


Image Notes
1. Flip up the lid to get to the programming socket

Step 5: Circuit Diagram

As space is at a premium here, I'm using a small 6V battery and dropping the voltage down by 1.2V to 4.8V with the diodes D1 and D2. The PicAxe chip is happy up to 5V so this is fine.

R1 and R2 are required to allow this to be programmed in-circuit and to re-program I plug in the USB / serial programming lead to the 3.5mm socket under the box lid.

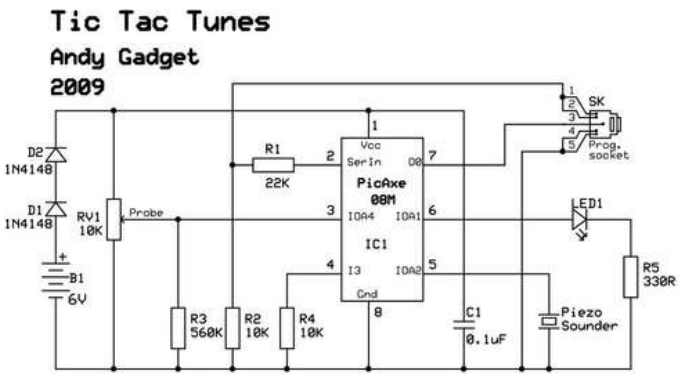
The 0.1uF decoupling capacitor is good practice with any circuit. It absorbs the voltage transients when transistors within the ICs switch. Without these, digital circuits can behave very strangely.

R3 is to pull the input to ground when the probe is not touching the track, otherwise it floats and generates all sorts of spurious noises. The solder blob on the track is to the positive rail to give a definite level for the control.

I've used a wide angle red LED but any LED will do. Drop R5 to 150R or so if using blue or white. There's not a lot of LED activity so as to keep the current consumption down.

Current consumption is around 1mA when active and drops to 200uA when in sleep mode, so the battery should last a fair while.

I used ExpressSCH to draw the schematics, and PDF Redirect to save to a PDF file. Both free.



File Downloads

TicTac.pdf ((595x842) 9 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'TicTac.pdf']

Step 6: PicAxe Microcontroller and Code

Code posted below in Word and Programming Editor formats. If you have trouble opening the code file, use 'save link as' and rename the .tmp file to .bas. I'll be commenting the code after the current re-write, but here's a quick summary :-

Tic Tac Tunes starts up after programming in 'sleep' mode. When asleep, the unit wakes briefly every 4 seconds and checks one of the ADCs (analogue to digital converters). If this reads 255 it wakes up. The ADC is held at 0 with no contact with a pulldown resistor.

Tic Tac Tunes now uses the ADC to read the track value which gives a reading from 0 to 255. The solder blob is at the positive rail voltage, so reads 255.

When awake, additional 255 pulses increase the tempo of the played notes (flashing the LED for each contact), and once the count gets to 8, it reverts to 1 and also switches to the other scale of notes (long LED flash). The PicAxe can only produce notes with a fixed duration, hence the need for the tempo control.

The tracks are in series, so the far end reads at around 127. This value is split in the software to upper and lower keyboard, and then into 18 notes, with 8 divisions for the percussion. An ADC value of zero (probe not touching) gives silence.

The percussion sounds are generated with a chunk of PicAxe SOUND commands, and the notes using TUNE. A watchdog timing loop is reset every time a note is played and if this doesn't happen at least every 20 seconds or so the unit goes into sleep mode until next awoken.

Tic Tac Scales adds more scales to the box, but drops the percussion. Turn on in the same way as Tic Tac Tunes, and select tempo and scale with the control blob. The LED will flash with tempo changes, and also beep as the scale changes to show the scale loaded. They are :-
1) Minor pentatonic
2) Blues
3) Hungarian
4) Arabic
5) Hejaz
5) Chromatic

Tic Tac Beat Box is a free-running beat generator. Start it up by touching the probe anywhere on the top track. It will then invent random beat sequences with 2 to 5 beats, at a range of tempos. It also mixes two sets (at the same count and tempo) to give a bit of variety. Every now and then, it starts a new set. At the start of each set the LED will flash to show the beat count, and gives a brief flash at the start of each bar. Touch the top track again to put it to sleep.

The PicAxe was initially developed for the educational market in UK schools but is being widely used by hobbyists. The PicAxe is based on various PICs but with bootstrap code to interpret the downloaded programs and handle the programming side. They come in all flavours from this suprisingly powerful 8 pin package up to full blown 40 pin.
Look at the manuals and datasheets on the PicAxe site to see the full capabilities. Programming of the chip is via a serial link and done in-circuit. It takes about 20 seconds and you don't even have to unplug the lead to run the program.
I've been in electronics since the early eighties and I've never found a programming environment where the coding / simulation / proving cycle is so simple.
Documentation and support from the forum is excellent and there are many robotics enthusiasts using the chips. Control for servos, steppers, ADCs etc are built in to the BASIC-like programming language as well as a host of other goodies. You can also simulate the circuit before you build, and do real-time debugging on a running controller. Look out for more PicAxe based projects from me.

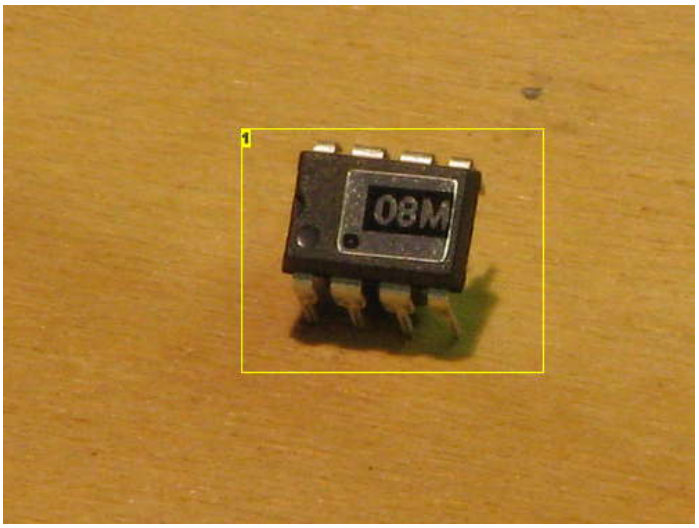


Image Notes
1. So small, but so powerful!

File Downloads

Tic Tac Tunes_V1.0.doc (32 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'Tic Tac Tunes_V1.0.doc']

TicTacScales_V1.0.doc (23 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'TicTacScales_V1.0.doc']

TicTacBeatBox_V1.0.doc (27 KB)

[NOTE: When saving, if you see .tmp as the file ext, rename it to 'TicTacBeatBox_V1.0.doc']

TicTacTunes_v1.01.bas (2 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'TicTacTunes_v1.01.bas']

TicTacScales_V1.0.bas (1 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'TicTacScales_V1.0.bas']

TicTacBeatBox_V1.0.bas (3 KB)
[NOTE: When saving, if you see .tmp as the file ext, rename it to 'TicTacBeatBox_V1.0.bas']

Step 7: Musical Notes

I've no formal musical training and this is a compressed version of what knowledge I've picked up over the years. If anyone finds errors, or has further ideas, please leave a comment.

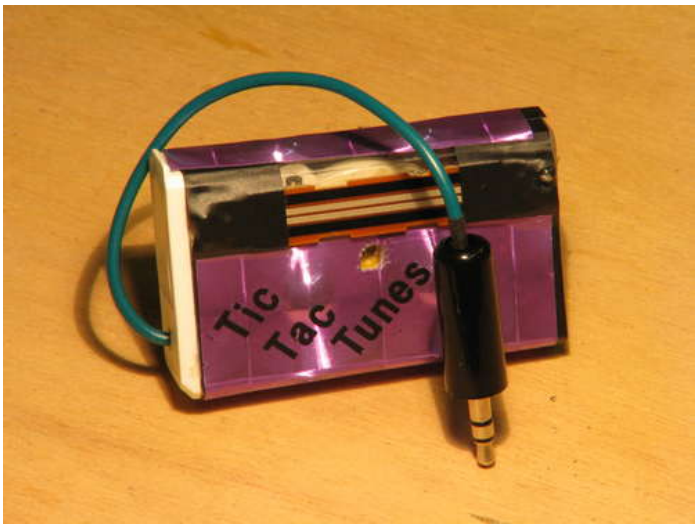
The PicAxe can produce musical tones across three octaves, which in a full chromatic scale (with the sharps and flats) is 36 notes. Because of the way the waveforms interact and the way the brain interprets this, some notes will sound 'wrong' when played next to each other.

Other scales have developed around the world which use a selection of these notes, and some of these don't allow the disharmonies of the full scale. The pentatonic (5 note) scales are like this. I've chosen a minor pentatonic of A C D E G.

The blues scale is similar, but usually has 6 or 7 notes and combinations of these are harmonious, but do give a sense of tension and resolution in certain combinations. I'm using C Db E Gb Ab Bb.

The chromatic scale is what you would use to play 'proper' tunes from written music, but the lack of definite note positions on TicTacTunes makes hitting the right note difficult. The positions could be marked, but it will take a better musician than me to play a recognisable tune. Improvisation with one of the harmonious scales is the way to go with this gadget.

On the title page are sound files recorded using other selections of 6 notes from the octave which characterise the sound of music from various areas of the world.



Step 8: Future Development

This project is actually a spin-off from another one which I wouldn't have time to complete for the sound contest. The other project has been at the planning stage for some time . . . about thirty years!! With my recent discovery of the PicAxe microcontroller, what I was planning becomes so much easier so I'll be cracking on with it now. (Once I've got a couple of other projects out of the way.)

The Project -
Many years ago I read the 'Vermilion Sands' series of short stories by J.G. Ballard and was intrigued by the 'Sonic Scupltures' which appear in several of the stories. These are sculptures which react in a musical way to the environment and to the presence of people. My first attempt at this was a bank of astable multivibrators made to change frequency in response to temperature and light, and interlinked so as to produce a wide range of bleeps, hoots, whistles and warbles (now I think about it, incredibly similar to theThingamagoop). This never got further than the workbench due to the pressures of 'real life'. With the PicAxe, making a polyphonic, environment sensing structure becomes much easier.

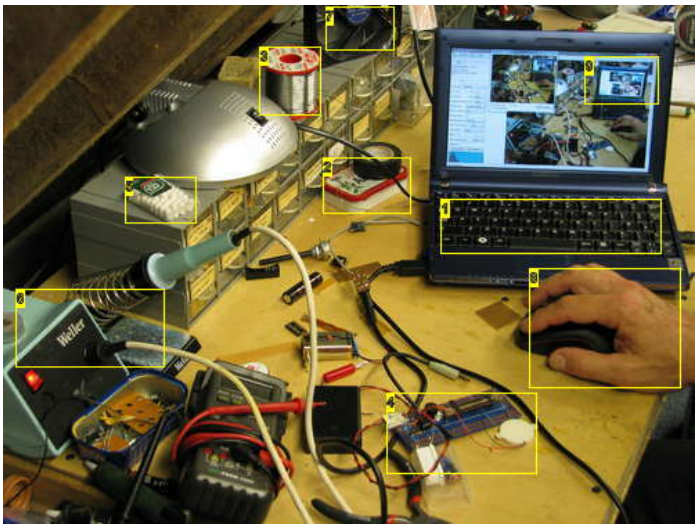


Image Notes
1. My latest toy - A Samsung NC10 netbook running Windows 7 extremely sweetly.
2. More Altoids projects on the way.
3. Proper solder - 60/40 tin / lead.
4. PicAxe dev kit.
5. Project box
6. Trusty soldering iron
7. It's hot up there
8. My second favourite hand.
9. Anyone for infinite regression?

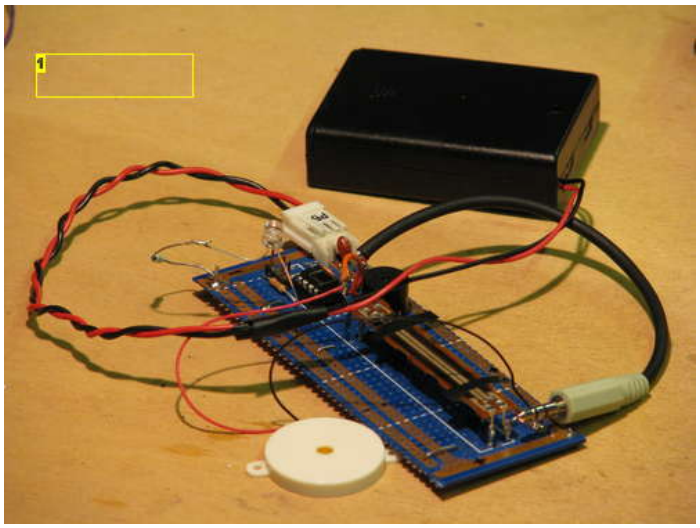
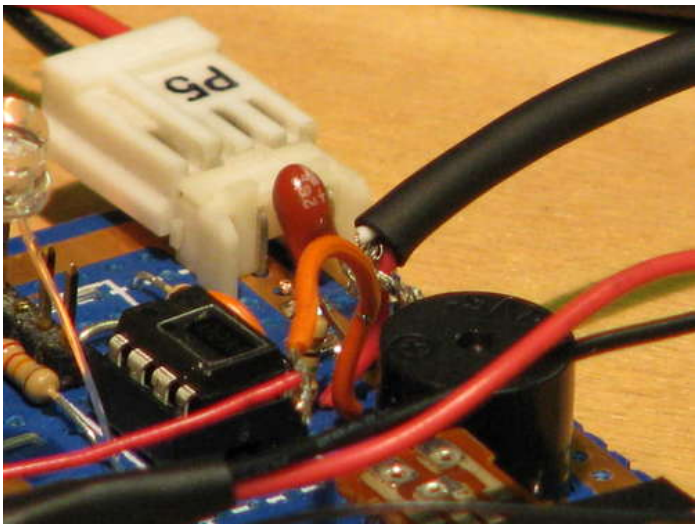


Image Notes
1. The Tic Tac Tunes Prototype



Related Instructables

Stylophone Deconstruction by AndyGadget

A Stylophone by drj113

Pic-Tac: A Guitar Pick Holder by -Jackal-

tic tac guitar pick case by MteamyMcHotsauc

Electronic Tic-Tac-Toe with RGB LEDs (video) by cedtlab

Tic-Tac catapult by vampierwolf

Comments

50 comments **Add Comment** **view all 177 comments**

yopdiesel says: Feb 17, 2011. 8:16 AM **REPLY**

Hi, and thanks for the nice tutorial.

I may sound noobish, but i just can't find a dual gang 10k dual gang potentiometer in my country. Although i have a single gang linear 10k pot of the same size. Will it make any differences if i replace the missing gang by a 10k resistor?

In advance, thanks for your answer.

AndyGadget says: Feb 17, 2011. 12:48 PM **REPLY**

Glad you like it #;¬)

Putting in a 10K fixed resistor should work OK, although you';ll lose the percussion sounds.

yopdiesel says: Feb 17, 2011. 10:30 AM **REPLY**

Oops, forget it, stupid question. I just found another 10k pot, i'll cope with it.

Leodip says: Jan 24, 2011. 3:05 AM **REPLY**

I want to make this but I'm Italian and I don't know name of the material in Italian.
Do you speak Italian? Or do you know their name in Italian?
Thanks anyway

AndyGadget says: Jan 24, 2011. 4:26 AM **REPLY**

Which material are you having trouble with. The Picaxe will still be called a Picaxe, and it looks like all the parts you need are available from Robot Italy - there must be an Italian language version as well.

(There are many languages in the world which I don't speak, and Italian is one of them.)

pietzeekoe says: Dec 30, 2010. 10:21 AM **REPLY**

In the parts list it sais you need 1 x 330R resistor. Did you mean 330K? or just ohm?

AndyGadget says: Dec 30, 2010. 12:49 PM **REPLY**

330R is 330 Ohm.
The 'R' is there to fit in with the standard system of labelling these things. The 'R' replaces a decimal point and indicates the multiplier, so, a few examples :-
R33 is .33 ohms
3R3 = 3.3 ohms
33R = 33 ohms
330R = 330 ohms
3K3 = 3.3 kilohms
3M3 is 3.3 megohms
33M is 33 megohms

moogbeatz99 says: Dec 7, 2010. 3:55 PM **REPLY**

dude this thing fricking rocks! literally!

firefliie says: Nov 27, 2010. 8:12 AM **REPLY**

i wish these were for sale because..i cant make one to save my life!
looks fantastic by the way!

chicken12175 says: Jun 27, 2010. 2:50 AM **REPLY**

im sorry if this seems a really stupid question,but how do you program the chip, as this looks a cool thing to make but i dont understand how to do that. Also how much does the programming lead thing cost normally?

AndyGadget says: Jun 27, 2010. 3:32 AM **REPLY**

The programming lead is the AXE027 and costs just under £12 - See the link in step 1 for your local supplier if you're not in the UK. This plugs into any USB port and then you load the drivers (from the website).
You'll also need to download the free programming editor from the website. This lets you write your own programs for the PicAxe.
Once you've built the PCB, all you need to do is to load my program into the Programming Editor, plug the lead into the 3.5mm plug on the board and click the 'program' button.

Theadamjacob says: Nov 9, 2010. 8:48 AM **REPLY**
Does it work on a mac?

AndyGadget says: Nov 9, 2010. 12:36 PM **REPLY**
There is a Programming Editor called the AxePad which is multi-platform, but I don't think it has all the programming aids the Windows version has. However you can edit and download existing programs to the PicAxe chips.
A Windows emulator on the Mac may work as long as it can handle serial ports.(I know very little about Macs.)

chicken12175 says: Jul 1, 2010. 11:11 PM **REPLY**
cheers!

SpEcleS8472 says: Sep 5, 2010. 12:07 PM **REPLY**
I wonder if this piezo sounder would work: http://www.datasheets.org.uk/datasheet-pdf/078/DSAE0067526.htm . It's really hard to get a fitting piezo sounder in Germany and the potentiometers are really expensive, too :O (5€ for a potentiometer is way too much). If anyone knows where to get suitable piezo sounders in Germany, contact me please.

godofal says: Nov 5, 2009. 5:35 AM **REPLY**
any way to have this in an attiny form? would help me alot, since i cant program PIC's (yet, but that "yet" might take a long time...)

AndyGadget says: Nov 5, 2009. 1:03 PM **REPLY**
I din't see why not (as long as it has an internal A to D and you can work out the frequencies and generate the tones).

godofal says: Nov 6, 2009. 6:13 AM **REPLY**
and in normal english(or dutch, but i doubt u speak that :D) that means?

im new to elektronics, so i dont understand what ur saying...

puppiesrock says: Jul 29, 2010. 1:52 PM **REPLY**
hey i speak dutch!!! :D i was born there! well in NL anyways=) and i have no idea wat it means either! but thats ok...

AndyGadget says: Nov 6, 2009. 6:59 AM **REPLY**
OK - I'll rewind a bit . . .
The A to D (analogue to digital) converter is a bit of circuitry which converts a voltage (set by the probe touching the resistive track) to a number that the 'computer' part of the chip can work with. The chip can tell where abouts on the track you're touching and which note you want to play. It will then produce a frequency on another pin which the speaker makes into a sound. e.g. for middle C it will produce a frequency of 440 Hz (cycles per second).
In the PicAxe there are simple commands to read the voltage and make the tone which a lot of other controllers would need much more code to do.

The PicAxe is a really good place to start if you want to play with microcontrollers as it has a very simple but powerful programming language (based on BASIC) which lets you do complex tasks with simple commands.
Have a look at the links HERE to get more information on what it can do.
(There are many many languages in the world which I do not speak, and Dutch is one of them ;¬)

godofal says: Nov 9, 2009. 5:22 AM **REPLY**
well, i dont believe attiny's have that A to D part, so il guess i still have to look for a picaxe programmer :D
and even if it had, the programming part would not be anything i could do...

guess i gotta get some tut on basic and C++ or something, il search it, but anything that u know is simple (for the real basics, for someone that doesnt know the first thing about it) so i can start fast with it?

nrdesign says: Nov 12, 2009. 4:57 PM **REPLY**
The ATTiny13 has even 4 A/D-Converters: "4-channel, 10-bit ADC with Internal Voltage Reference" (Excerpt from the datasheet, which can be found here: http://www.atmel.com/dyn/resources/prod_documents/doc2535.pdf)

godofal says: Nov 14, 2009. 6:39 AM **REPLY**
wow.
i dont think anyone has ever said so much i didnt understand within 1 sentence :D

shopatross says: Mar 16, 2010. 11:38 AM **REPLY**
i never worked with electronics before im more of a mechcanical so would this be a hard first project??

knex_mepalm says: Mar 17, 2010. 2:10 AM **REPLY**

Haven't you been to high school, on my freshman year and I learnt electronics.

AndyGadget says: Mar 16, 2010. 11:53 AM **REPLY**

The circuit is pretty simple and as long as the track cuts and components go in the right places and the right way around, there shouldn't be a problem. You'll also need to program the PicAxe but there's plenty of information here and elsewhere.

If you're doing this as a first project, I'd make it larger and not try to squeeze the whole thing into a TicTac box. This will allow you to lay out the circuit more like the diagram and give you practice at designing your own stripboard layout.

pbecker83 says: Jan 12, 2010. 6:10 PM **REPLY**

Very cool. Nifty little project. Great for beginners,

grandtippler says: Dec 9, 2009. 4:16 PM **REPLY**

Great project. Good to see more people messing with sounds on the 08M.

Jodex says: Dec 8, 2009. 6:47 AM **REPLY**

I really haven't done any PIC project YET. So I'd have a question. Or lets put it this way. Sure I can program the PICAXE with an USB programming cable(www.hvwtech.com/products_view.asp) when using this software?
www.hvwtech.com/products_view.asp The first free one is the one. This is great instructable anyway.

AndyGadget says: Dec 8, 2009. 8:32 AM **REPLY**

That's the one. You'll also need the drivers from HERE (AXE027 - near the bottom.)

Jodex says: Dec 8, 2009. 9:07 AM **REPLY**

Thank you.

bsachtjen says: Nov 16, 2009. 9:53 AM **REPLY**

AWESOME! do you have any idea of when the Kit is going to be available?

bsachtjen says: Nov 17, 2009. 11:20 AM **REPLY**

Well i dont really need the WHOLE kit, i just think it would be nice if you could sell the PicAxe programmed. Just let me know if you can do that

---

Britain says: Nov 12, 2009. 7:00 PM **REPLY**

I would just buy one if it was available cause i really want one :I

swimmer95 says: Oct 29, 2009. 5:54 PM **REPLY**

awesome

jason-2590 says: Oct 29, 2009. 5:15 PM **REPLY**

THAT IS THE COOLEST THING I HAVE EVER SEEN I WANT ONE NOW.

50/10 yeh that is 50 out of 10 its f*ckin amazing

kcls says: Oct 29, 2009. 4:14 PM **REPLY**

About how much did all of this cost to make?

zoltzerino says: Oct 14, 2009. 9:55 AM **REPLY**

What are the diodes for and are they strictly necassary?I presume it is to to with directing the voltage to protect something(as in a radio circuit).

AndyGadget says: Oct 14, 2009. 10:38 AM **REPLY**

The Picaxe allowed supply voltage range is 2.2V to 5.5V. I'musing a 6V battery. Each diode will drop about 0.6V whenthere's a current flowing through it so the supply at the PicAxe pin isaround 4.8V - Perfect! Diodes are a simple way of losing a bit ofvoltage which will be the same (almost) irrespective of the currentdrawn. (I could have used 3 small button cells in series toget the right voltage, but that was too fiddly ;¬)

zoltzerino says: Oct 15, 2009. 1:43 PM **REPLY**

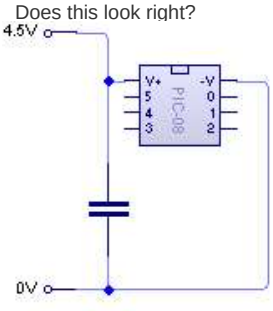
Good answer, thanks. When using the PIC (not PicAxe) chips atschool we half a capacitor between the +ve input to the chip and 0vrail, do you think it is necessary to include one in with the08m? (some 08m boards do and others don't).

AndyGadget says: Oct 16, 2009. 10:47 AM **REPLY**

The short answer is 'yes'.
The full answer is . . . Digital logic tends to draw very short high current spikes from the supply rails as they change state. (It's a side-effect of obtaining high switching speeds.) The capacitors are to absorb these transients and stop them being passed on to other devices. If this is not done, they can cause false triggering. They are called 'decoupling capacitors'.
At college many years ago one of the early practical experiments we did was to make a ripple counter out of d-type flip flops. We were told not to put any decouplers in and the circuits counted erratically and seemingly randomly. Then we put in the capacitors and everything worked fine.
A lot of circuits will work perfectly well without them, but it is good design practice to put in one across the rails as close as possible to the power pins for each chip.

zoltzerino says: Oct 18, 2009. 5:09 AM **REPLY**

Does this look right?



AndyGadget says: Oct 18, 2009. 5:48 AM **REPLY**

Yep, that's where it goes in the circuit, but as I said, put it close to the chip *physically*. It's not the case here, but if you're using motors or servos in a circuit you have to be *very* careful to decouple properly, otherwise the electrical noise can stop the circuit working at all.

mandanao says: Oct 13, 2009. 7:05 AM **REPLY**

Very nice project, compliments!

"Sonic Sculptures"like those created by by Ballard always bewitched me, both in electronical and mechanical form, take a look at

http://www.youtube.com/watch?v=4B0hGyKV9qs&feature=related

I have planned to realize many of your devices to use them with my students.
As soon as possible I will send you some video concerning this idea.

Again, bravo!

AndyGadget says: Oct 13, 2009. 9:01 AM **REPLY**

Thanks for the Singing Ringing tree link. I have relatives just a bit further North than Burnley so I think we'll take a detour to see that next time we visit.

This project won me a Thingamakit in the Art of Sound contest and I'm going to be building that as a sonic sculpture when I get the chance. I'll be modifying it to use various environmental sensors (heat, light etc) instead of the manual controls. (So many projects, so little free time . . .)

lastdayback says: Sep 21, 2009. 7:11 AM **REPLY**

This is an amazing project. I can't seem to find all the parts here in my area. Know when your gonna have the kit available?

szechuan53 says: Sep 19, 2009. 7:08 AM **REPLY**

ZOHMAHGAWD this is one of the best instructables I've seen in a while. Can't wait for the kit. :D

amanihoot says: Sep 12, 2009. 9:20 PM **REPLY**

where did you get the supplies?

AndyGadget says: Sep 13, 2009. 7:16 AM **REPLY**

Step 1 tells you where to get the bits, although any good electronics supplier will have everything but the PicAxe; that comes from one of the suppliers linked in the text.

shawntherobot says:
would radio shack have the supplys and how much did it cost all together to make it

Sep 14, 2009. 12:49 PM **REPLY**

view all 177 comments