



ATTiny Programming Shield for Arduino

by Plusea (/member/Plusea/) in microcontrollers (/tag/type-id/category-technology/channel-microcontrollers/)

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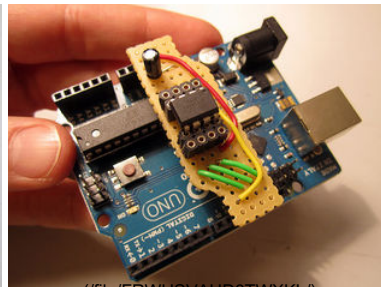
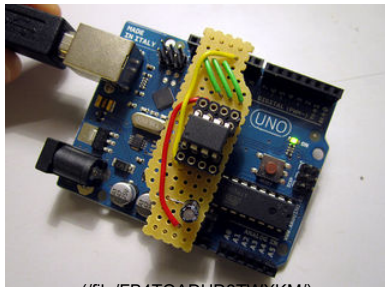
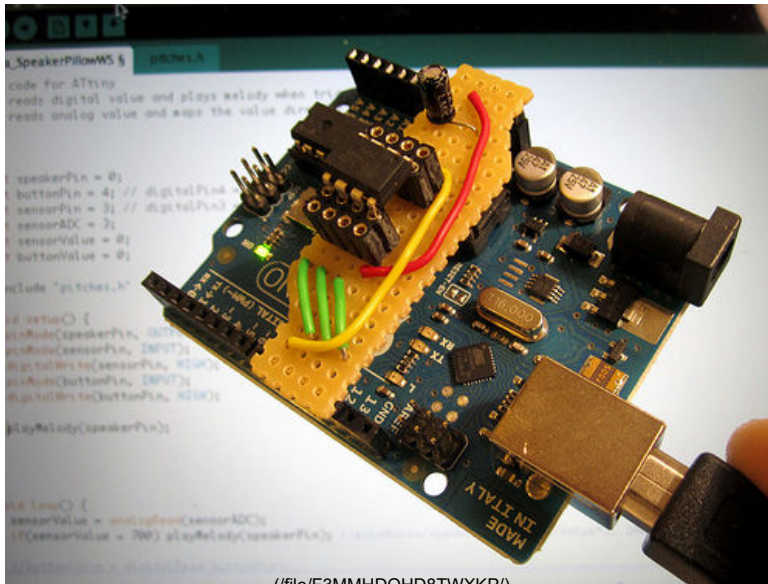
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(/member/Plusea/)
(http://www.plusea.at)

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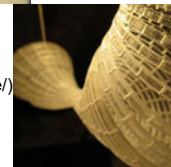
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(/id/3D-Sewing-Rings-With-Strings/)

This little circuit sits nicely ontop of an Arduino board and lets you quickly plug in an ATtiny chip for programming using the Arduino "language" and IDE to write the code, and the Arduino board as an ISP programmer to upload the code to the tiny chip.

These instructions are also published on our website titled HOW TO GET WHAT YOU WANT (http://www.kobakant.at/DIY/?p=3996).

For instructions on how to use Arduino to program ATtinies, please look at the following links. This Instructable will only explain how to build the programming shield.

Arduino as ISP >> http://www.kobakant.at/DIY/?p=3742

(http://www.kobakant.at/DIY/?p=3742)

Arduino board as ATtiny programmer (by Dave Mellis) >>

http://hlt.media.mit.edu/?p=1706 (http://hlt.media.mit.edu/?p=1706)

Programming an ATtiny w/ Arduino 1.0.1 (by Dave Mellis) >>

Related



DIY ATtiny ISP Shield Programmer (/id/DIY-ATTiny-ISP-Shield-Programmer/) by MohanR3



Arduino ATtiny2313 Programming Shield (/id/Arduino-ATTiny2313-Programming-Shield/)



Arduino ATTiny Programming Shield (/id/Arduino-ATTiny-Programming-Shield/) by webgeeks



Programming the ATTiny85, ATTiny84 and ATmega328P : Arduino As ISP (/id/Programming-the-ATTiny85-ATTiny84-and-ATmega328P-As-ISP/)

<http://hlt.media.mit.edu/?p=1695> (<http://hlt.media.mit.edu/?p=1695>)
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 Plusa (/member/Plusa/) in microcontrollers (/category/technology/channel/microcontrollers/)
 There is also a really nice tiny AVR Programmer now available from Sparkfun
 (designed by Dave Mellis) that does the same thing even more compactly >>
 Download <https://www.sparkfun.com/products/11460>
 (https://www.sparkfun.com/products/11460)



Tri-Mode Digital Clock with
 ATtiny85 / UNO R3 and RTC
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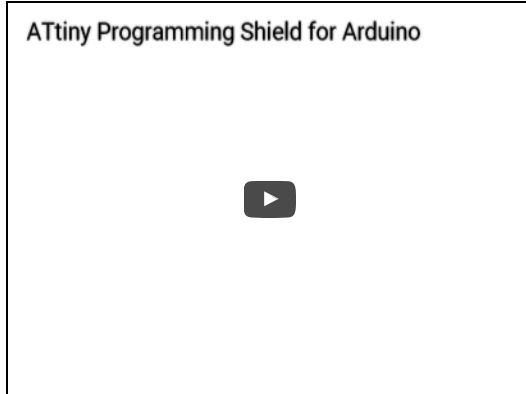
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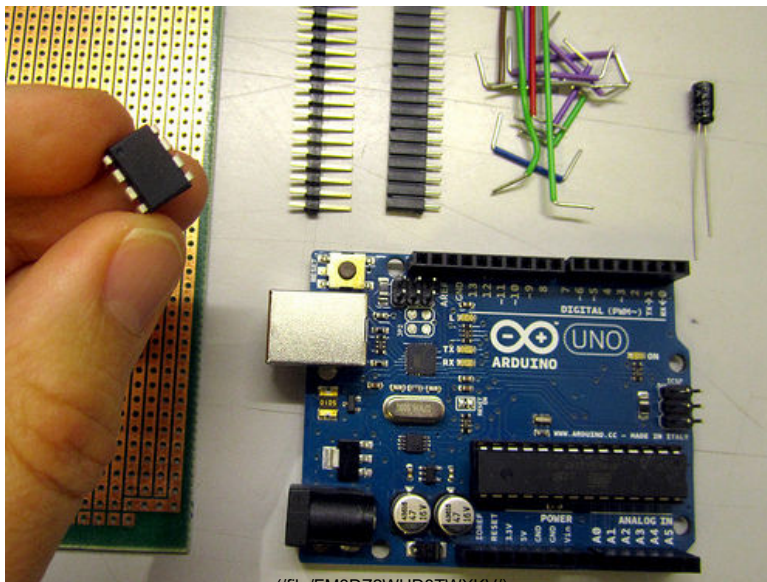
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Video of "ATTiny Arduino Shield Programmer" in action



Step 1: Materials and Tools



Materials

- Perforated circuit board
- Male and female headers
- Wire
- 10uF capacitor
- Arduino Uno or Duemilanove (with an ATmega328, not an older board with an ATmega168!)
- ATtiny45 or 85

Tools

- Cutter knife
- Cutting mat
- File
- Wire cutters and stripper
- Soldering iron
- Helping hand

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Step 2: Cut Circuit Board to Shape ATTiny Programming Shield for Arduino

by Plusea (/member/Plusea/) in microcontrollers (/tag/type-id/category-technology/channel-microcontrollers/)

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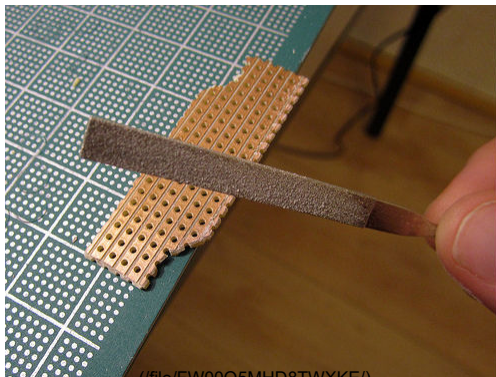
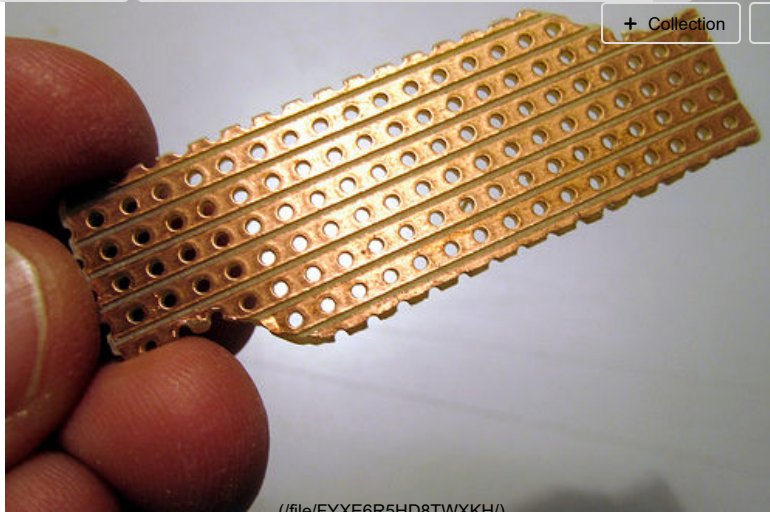
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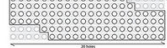
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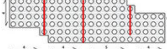


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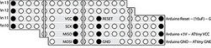
Circuit Board:



Disconnections:



Connections:

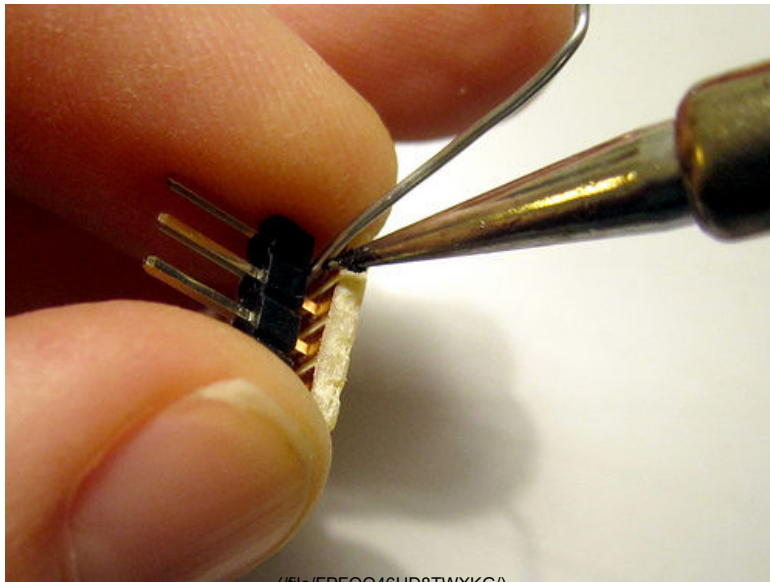


Wiring:



Cut a piece of perforated circuit board to size (see illustration) and file the edges.

Step 3: Solder Male Headers



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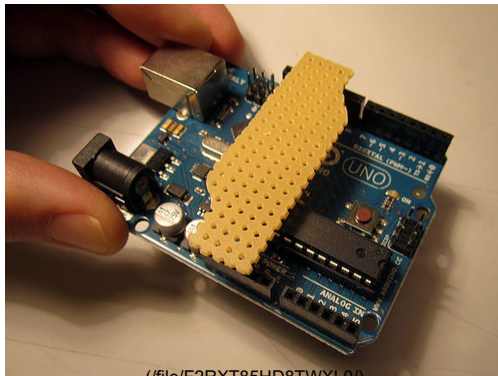
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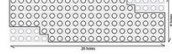


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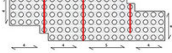


ATTiny Programming Shield for Arduino

Circuit Board:



Disconnections:



Connections:



Wiring:



Take two rows of four male headers and solder them to the circuit board, but with the solder connections on the unintended side of the circuit board. So solder them you will need to hold them away from the circuit board a bit so that you can make the solder connection. Once you've got the first pin soldered the rest will be easier.

Video: Soldering headers to perforated circuit board:

Soldering Headers to Front of Circuit Board

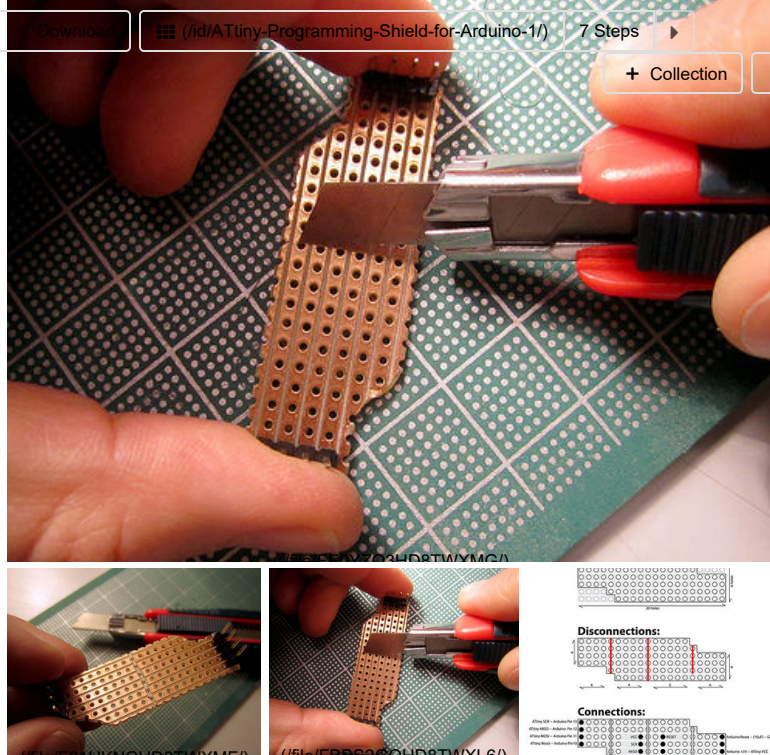


Before continuing, make sure the board with headers fit into your Arduino.

Step 4: Disconnect Circuit Traces

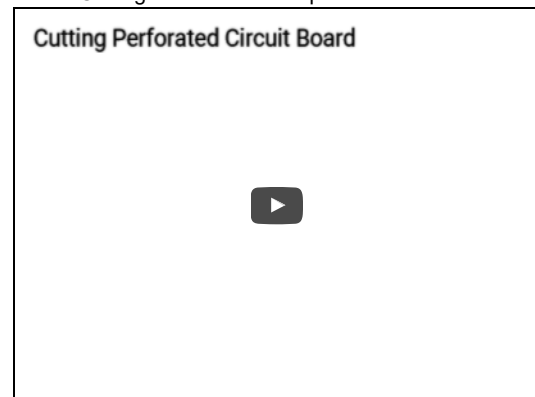
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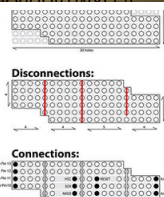
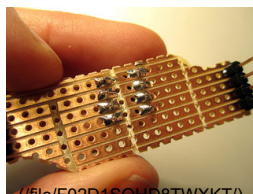
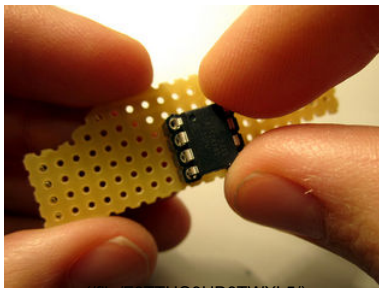


Disconnect the line traces as follows (see illustration and video) using a cutter knife

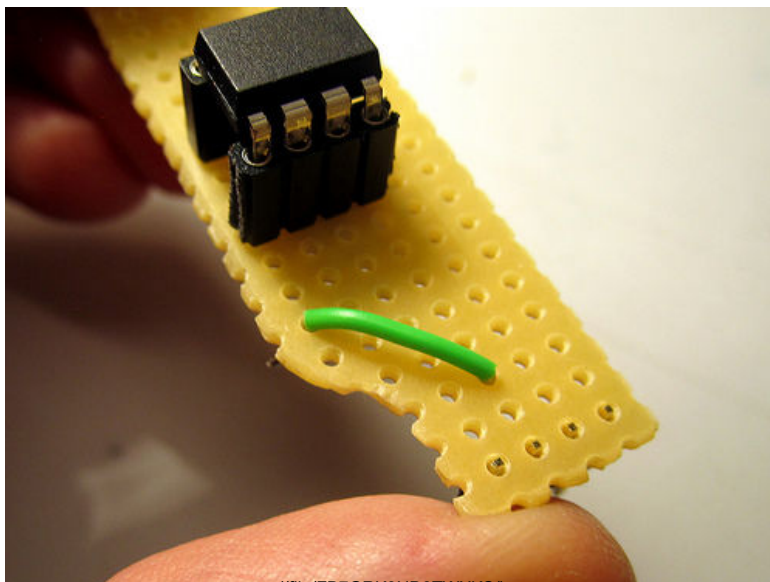
Video: Cutting connection on a perforated circuit board:



▶



Step 6: Solder Circuit



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INTRODUCING THE ATTINY

ATtiny45 / ATtiny85

Reset	1	8	VCC (+)
(Analog Input 3) Pin 3	2	7	Pin 2 (Analog Input 1, SCK)
(Analog Input 2) Pin 4	3	6	Pin 1 (PWM, MISO)
(-) GND	4	5	Pin 0 (PWM, AREF, MOSI)

ATtiny Programming Shield for Arduino

Circuit Board:

Disconnections:

Connections:

Wiring:

Use jumper wire or cut wire to length and strip either end and start to populate the circuit board with wires to make the connections between the pins of the Arduino and the pins of the ATtiny. Use illustration and the following information for reference. Bend wires on bottom side to stop them falling out before you solder them.

Wiring your ISP connection

ATtiny ----- Arduino

Pin PB2 (SCK) ----- Pin 13

Pin PB1 (MISO) ----- Pin 12

Pin PB0 (MOSI) ----- Pin 11

Pin PB5 (Reset) ----- Pin 10

Plus (VCC) ----- +5V

Minus (GND) ----- GND

10uF Capacitor:

Arduino pins: RESET ----||---- GND

ATTiny Programming Shield for Arduino

Plus a link to the source code for the program. (http://www.instructables.com/id/ATTiny-Programming-Shield-for-Arduino-1/) 7 Steps

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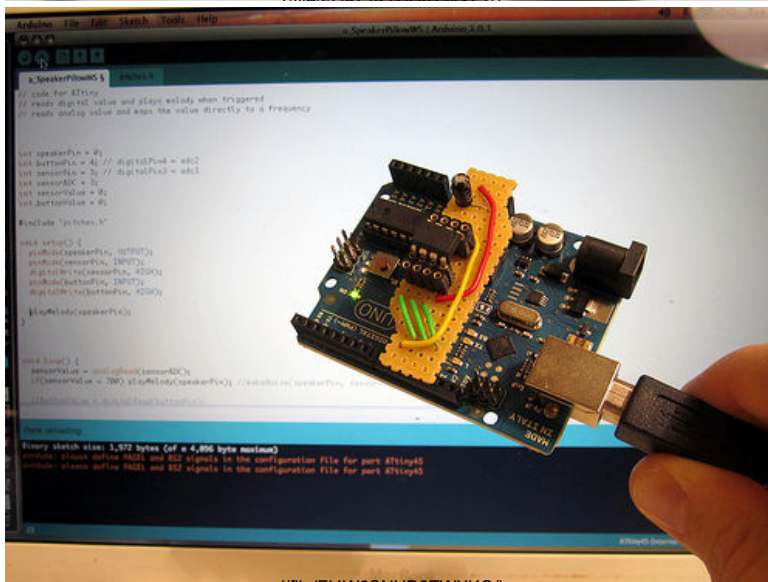
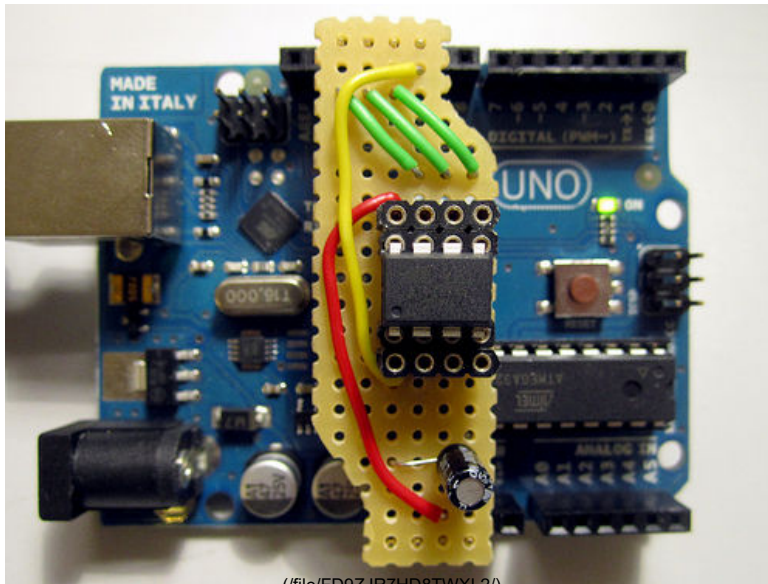
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When you've finished making all the connections illustrated in the diagram (including the capacitor) then you are DONE!

Step 7: Upload Your Program!



Now plug in your Arduino and follow the instructions in the Arduino as ISP post linked to at the top of this page.

Video: Using ATTiny shield to program an ATTiny to play a song

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by Plusea (/member/Plusea/) in microcontrollers (/tag/type-id/category-technology/channel-microcontrollers/)

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Post Comment



Suraj Bhawal (/member/Suraj Bhawal) made it!

3 months ago

Reply

Homemade Attiny programming shield on homemade arduino UNO... works great.



(<https://cdn.instructables.com/FIC/M63F/IZ6CNAWU/FICM63FIZ6CNAWU.LARGE.jpg>)



Tanmay Deuskar (/member/Tanmay Deuskar)

a year ago

Reply

Hello,

This project is awesome! Can it be used to program all Attiny 85 sketches?

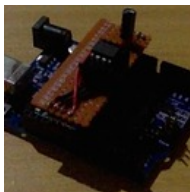


GustoS (/member/GustoS) made it!

2 years ago

Reply

thanks for the tutorial



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totodix (/member/totodix)

2 years ago

Reply

I made it. Thanks

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MattiaD (/member/MattiaD) made it!

2 years ago

Reply

thx man!



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luiscll (/member/luiscll) made it!

2 years ago

Reply

Great instructable. Thanks :)



(https://cdn.instructables.com/FME/I930/I85QO0SC/FMEI930I85QO0SC.LARGE.jpg)



The Expert Noob (/member/The Expert Noob)

2 years ago

Reply

Where do you get your round breakaway female headers?



tym3k (/member/tym3k)

2 years ago

Reply

Does the capacitor really need to be 10uF? Or will 1uF also work, because I only have 1uF capacitors.



masterleo (/member/masterleo) ▶ tym3k (/member/tym3k)

2 years ago

Reply

I heard in Hackable.fr that you can use bigger capacitor but not smaler uF



The Expert Noob (/member/The Expert Noob) ▶ masterleo (/member/masterleo)

2 years ago

Reply

Ive never used a capacitor when programming the ATtiny85, I just wired it wire 4 wire to the Arduino Uno and programmed via ArduinoISP. What's the capacitor for?



masterleo (/member/masterleo) ▶ The Expert Noob (/member/The Expert Noob)

2 years ago

Reply

I guess it's to disable the auto reset of the Arduino, it's connected betwin pin RST(reset) and GND(ground), Hackable.fr says "so that the arduino is ready to transmit the data that the computer is sending and does not reset before the transmission..."
I never use this one too, I don't understand ...

ATtiny Programming Shield for Arduino

by [Plusea \(/member/Plusea/\)](#) in [microcontrollers \(/tag/type-id/category-technology/channel-microcontrollers/\)](#) 2 years ago [Reply](#)

Thanks for the excellent instructable!

Download and add a NOA Switch Programming Shield to the ATtiny85 on the fly. Works great! Thanks again!

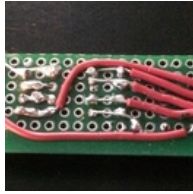
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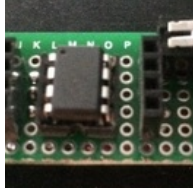
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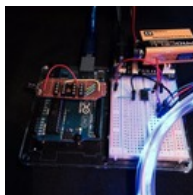
Huuunksam (/member/Huuunksam) made it!

2 years ago

[Reply](#)

First ever Aduino/ATtiny project success!

(thanks to you) ;)



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justwondering101 (/member/justwondering101)

3 years ago

[Reply](#)

Does this ATtiny85 chip need a bootloader? Or can you program one bought straight from the Atmel store?



Shoyun (/member/Shoyun) ▶ [justwondering101 \(/member/justwondering101\)](#)

3 years ago

[Reply](#)

Taken from the author's website:

Burn Bootloader

To set the clock speed of your ATtiny to be faster (8Mhz) than the default 1 MHz.

- Select "ATtiny45 (8 MHz)" from the "Tools > Board" menu

- Select "Arduino as ISP" from the "Tools > Programmer" menu

- Select "Burn Bootloader" from the "Tools" menu

So yes you can buy some ATtiny85 anywhere, you will be able to burn the bootloader with this programming shield here :)



masterleo (/member/masterleo) ▶ [Shoyun \(/member/Shoyun\)](#) 2 years ago

[Reply](#)

This does not burn Bootloader (source: hackable.fr) but does set some "fuse" to the desired value


grayl (/member/grayl)

2 years ago

Reply

ATTiny Programming Shield for Arduino

Have we somehow skipped the part where the second set of four parallel Plusea (/member/Plusea/) in microcontrollers (/tag/type-id/category-technology/channel-microcontrollers/) female jumpers on each side of the Tiny are added? It's trivial to do, but...

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3 years ago

Reply

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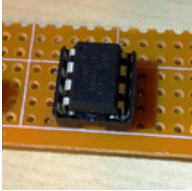
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Shoyun (/member/Shoyun) made it!

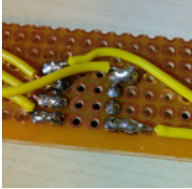
3 years ago

Reply

Thanks you, works fine !



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cornbread ninja (/member/cornbread ninja) made it!

3 years ago

Reply

Thanks for making this Instructable!



(<https://cdn.instructables.com/FRW/JS1C/HX7P975E/FRWJS1CHX7P975E.LARGE.jpg>)


TheFlorifant (/member/TheFlorifant)

3 years ago

Reply

Why is there a second row of headers on eighter side of the ATTiny chip?


JoburgJim (/member/JoburgJim)

▶ TheFlorifant (/member/TheFlorifant)

Reply

3 years ago

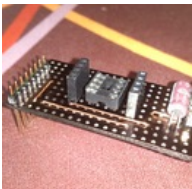
To connect the sensors and actuators that the sketch in the atTiny needs to read and control


Victor805 (/member/Victor805)

3 years ago

Reply

Thanks for the info.



(<https://cdn.instructables.com/FSO/ABPG/HUUXJTPO/FSOABPGHUUXJTPO.LARGE.jpg>)


Mic100 (/member/Mic100)

3 years ago

Reply

interesting work thank you

how did you programmed music on the ATTiny ?

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Plusea (/member/Plusea/) in microcontrollers (/tag/type-id/category-technology/channel-microcontrollers/)



Download (/member/wliu3/) ATTiny Programming Shield-for-Arduino-1/)

7 Steps 3 years ago

Reply

Are there any schematics? Can you upload them?

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TheFlorifant (/member/TheFlorifant/)

3 years ago

Reply

Can anyone explain to me what an ATTiny actually is. I'm just in my first year computerscience and haven't seen these.



mlee89 (/member/mlee89/) ▶ TheFlorifant (/member/TheFlorifant/)

Reply

It is a 8-pin microcontroller chip

3 years ago

<http://www.atmel.com/devices/attiny85.aspx>



piggybankcowboy (/member/piggybankcowboy/)

3 years ago

Reply

Very cool! Also, if you need me, I'll be in the corner having a panic attack over how close the tip of that soldering iron is to your finger.



tecnocubeguy (/member/tecnocubeguy/)

4 years ago

Reply

So, on the arduino power headers, both ground pins (in between Vin and 5V) are completely the same, and interchangeable? One of the above diagrams shows 10 uf between RESET and the GND furthest from the usb plug, however, your design only uses the GND closest to the usb. That won't cause any problems? I'm new to arduinos and microcontrollers, but that kinda seems weird for there to be two of the same pin on the arduino. Enlighten me. :)



waterlubber (/member/waterlubber/) ▶ tecnocubeguy (/member/tecnocubeguy/)

3 years ago

Reply

There is absolutely no difference, except for extremely miniscule interference, between the grounds on the arduino. There are multiple ones for the sake of convinience. If you don't want to fork over your capacitors, you can use a 200 ohm resistor between RESET and 5Vcc on the ARDUINO.



robot797 (/member/robot797/)

3 years ago

Reply

do you have a high res version of the layout?



MakerDP (/member/MakerDP/)

4 years ago

Reply

...and it worked! Now I think I am going to build a "shield" that will plug-into the '85 header pins so that I can program an '84 chip using the same basic setup.

Thanks for the practical Instructable and the inspiration to take it a step further.



MakerDP (/member/MakerDP/)

4 years ago

Reply

Well done! Just finished putting it together and about to plug it in for the sniff-test.



jnowak1054 (/member/jnowak1054/)

4 years ago

Reply

Yes, they are both connected to the ground plane on the board or are "interchangeable." Two grounding points are often very useful. I usually use them both on two separate breadboards, each containing different connected



4 years ago
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4 years ago

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