AdaBox 005

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https://learn.adafruit.com/adabox005

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Introduction

If you're looking to subscribe to AdaBox, click here! (https://adafru.it/tNC)

Hi there!

If you're here, it's because you were given the gift of electronics with an AdaBox! You are a beginner who is getting started with your AdaBox or you just want to relive what it's like being a beginner at electronics again. But most of all, you want to learn how to build and make stuff with electronics! (If, rather than learn electronics, you'd like to look at pictures of cats instead, please check https://www.adafruit.com/galleries/cats-of-engineering (https://adafru.it/oAd))

And, you're in luck: there's never been a better time.

Gone are the days where you need thousands of dollars of equipment and lots physics/math background. Nowadays, if you want to learn to work with electronics, you can jump right in for $100 or less, and any sort of computer. And we're talking about learning a lot of electronics - from the basics of analog to the complexities of embedded Linux. With a good pack of parts, you can build a base of knowledge that will take you from your first blinking LED to someone who can start prototyping and inventing custom products.

Who is this for?

Anyone with a computer they can install software on, with a TV and a love of video games! That's pretty much the minimum. Remember, this guide is specifically for people who have purchased or received an AdaBox subscription.

You don't need to know a lot of physics or math, and just like an Art Degree isn't required for making art and being creative, **you don't need to have a computer science degree**. It helps if you're comfortable using computers but that's a skill most people pick up through life.

If you know how to solder or use Raspberry Pi already - great! If not, don't worry, we'll teach you enough to be dangerous.

Who **isn't** this for?

While you can follow along without an AdaBox, it will not make as much sense unless you have all of the components and more which either came as a gift or purchased yourself - remember, the goal is helping beginners!

If you're an expert, please visit our hundreds other tutorials and jump right in at learn.adafruit.com (https://adafru.it/rdw)

Who are you?

Great question. This is me:

I'm Ladyada, and I love to teach people how to build stuff and how they can be creative with technology.

So, are you ready?

Let's do this thing!

Unboxing AdaBox 005

You've consumed four AdaBoxes - the equivalent of a delicious, nutritious, meal of DIY electronics. And now it's time for dessert.

Pour yourself some coffee (or a nice cold glass of milk) because it is finally time for Raspberry Pi.



Kit Contents

- Raspberry Pi Zero (http://adafru.it/2885) - This is the slimmest, most pared down Raspberry Pi to date. It's kind of like the little cousin to the Pi 2 (http://adafru.it/2358) - with just a micro SD card slot, a mini HDMI port, two micro USB ports (one for power, one for USB), and 512MB of RAM. It has a single-core 1 GHz processor chip, similar to the Pi A+ and B+. These Pi's are limited but the Pi Foundation kindly helped us out to get one in each Adabox!
- Adafruit Joy Bonnet (http://adafru.it/3464) - Pocket-sized fun is the name of this game, with the **Joy Bonnet** – our most fun Bonnet ever (no we didn't even think that was possible, either!). This Bonnet fits perfectly on top of your Raspberry Pi Zero (any kind) and gives you adorable hand-held arcade controls. Once you install our script onto your Pi, the controls will act like a keyboard, for easy use with any emulator or media player.
- Raspberry Pi Zero Case (http://adafru.it/3252) - This is a basic, classic **Pi Zero enclosure** with a black base and a clear top. The case is as minimal as it gets, coming in just two pieces of polycarbonate that snap snugly together. This case will keep your Pi Zero safe and secure while also looking super sleek.
- Mini HDMI Cable (http://adafru.it/2775)- This cable is nice and long, you can plug in one half into your Pi Zero and the other into a TV
- Hammer Headers (http://adafru.it/3413) - courtesy of our friends at Pimoroni - **Absolutely no soldering required!** All that's needed is a few gentle taps with a hammer and bazinga! Your header is securely attached to your Pi Zero.
- USB Power Supply (http://adafru.it/1995)- This power adapter has a long cord and a micro USB connector on one end. Plug it into your Pi Zero to power it. Its plenty strong! If you are not in the US, you can use a common '$1' plug adapter,

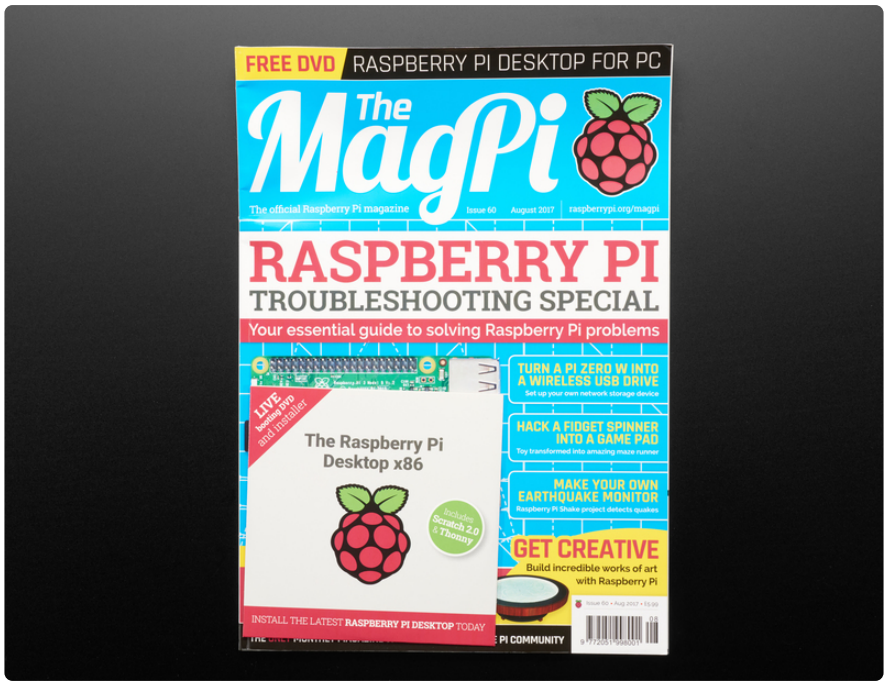
the power supply can take 100V-240V 50-60Hz power and just needs a plug adapter.

- 8GB SD Card (http://adafru.it/2767)- Lots of space! This SD card will hold the operating system (Raspbian) and video games you will play
- USB MicroSD Card Reader (http://adafru.it/939)- We added one of these in case you do not already (Adabox is for beginners!) You can use it to read/write data from the SD card



Bonus parts (for subscribers only!)

- **EAGLE insert** - Check out the EAGLE design for the Adafruit Joy Bonnet! This is the real design, with some nifty colors, so you can get a sense of what it's like to design a PCB. Autodesk's EAGLE is a great way to start designing electronics. Makers and students can download EAGLE for free.
- **Pi Foundation swag** - it wouldn't be a pi-break without some fun stuff from the Raspberry Pi foundation. They've included the latest MagPi magazine, a fun offer for MagPi subscribers, and a few stickers to show your love of all things Pi.
- **Limited Edition Collectible Pin** - Joy is the super fun game controller friend you've always wanted. While most everything makes her smile, DIY gaming rigs make her grin tooth to tooth.



Getting started with your new AdaBox



With this AdaBox, you will be able to create a tiny gaming machine that will fit in your pocket. Take it out, attach to power and your tv and play all of your favorite classic games.

Like all AdaBoxes, there is no soldering required. We have partnered with our pals at Pimoroni to include the neat Hammer Headers. With this project, you should be gaming in no time.

As usual, our team of Creative Engineers have come up with some really unique projects for those who want to take the theme of this box to the next level.

Let's get started!

Step 1: Install the Hammer Headers

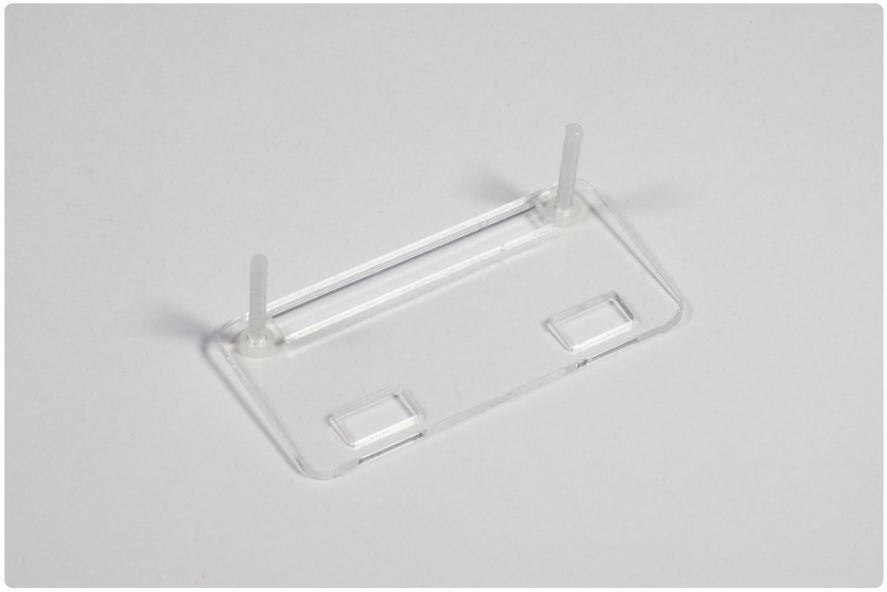
These awesome Hammer Headers from our friends at Pimoroni (https://adafru.it/zac) allow you to fit the male header to your Pi Zero with absolutely no soldering required. Nifty! Here, you'll learn how to fit them using the jig that comes with the kit.

It's important to hammer on a sturdy, stable, well-supported surface like a worktop or a solid wood table (although not your expensive dining table!)

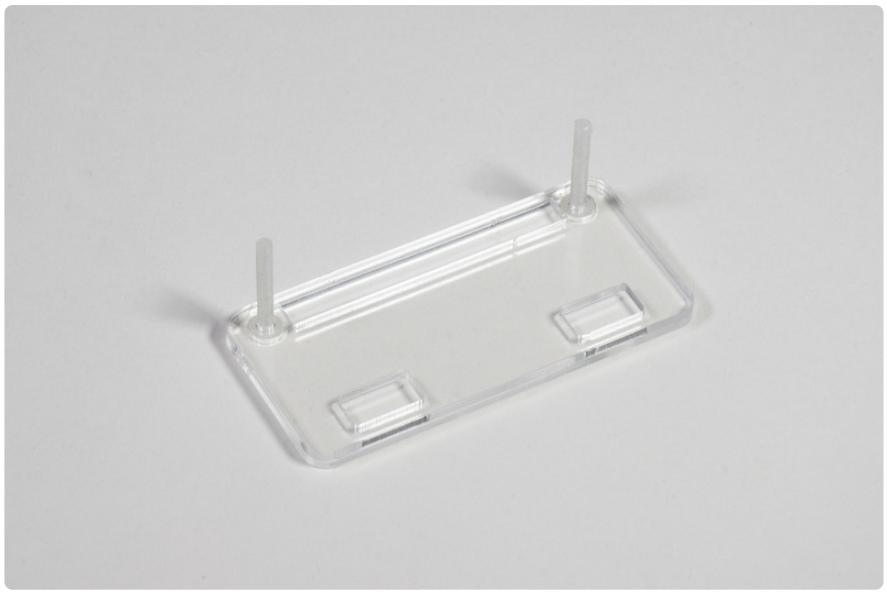
The jig comes in three pieces, and has two nylon bolts. Snap apart the acrylic pieces, and peel off the protective film (althought this isn't absolutely necessary).

Please watch the video below and read each step carefully below before installing your hammer headers.

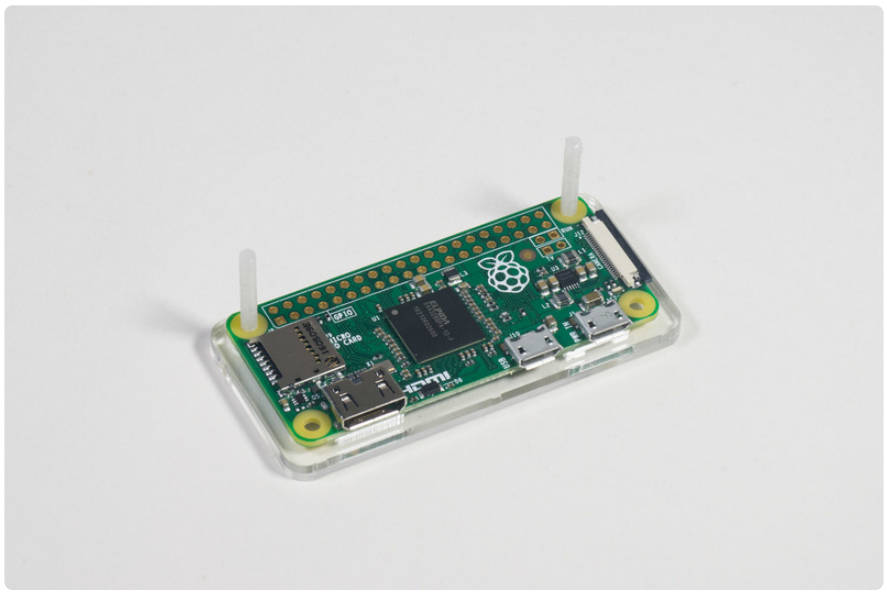
Push the nylon bolts through the larger plastic piece with the long rectangular hole cut in it for the GPIO pins. It doesn't matter which way up this piece is.



Next, put the other rectangular acrylic piece below it, so that the heads of the nylon bolts fit neatly into the two holes. This piece prevents the pins from being pushed too far through.



Now, push your Pi Zero PCB, right way up, onto the jig.



Place the hammer header on top of the pin holes on your Pi Zero, making sure that the longer ends of the pins (without the retaining nubbins) are pointing upwards.

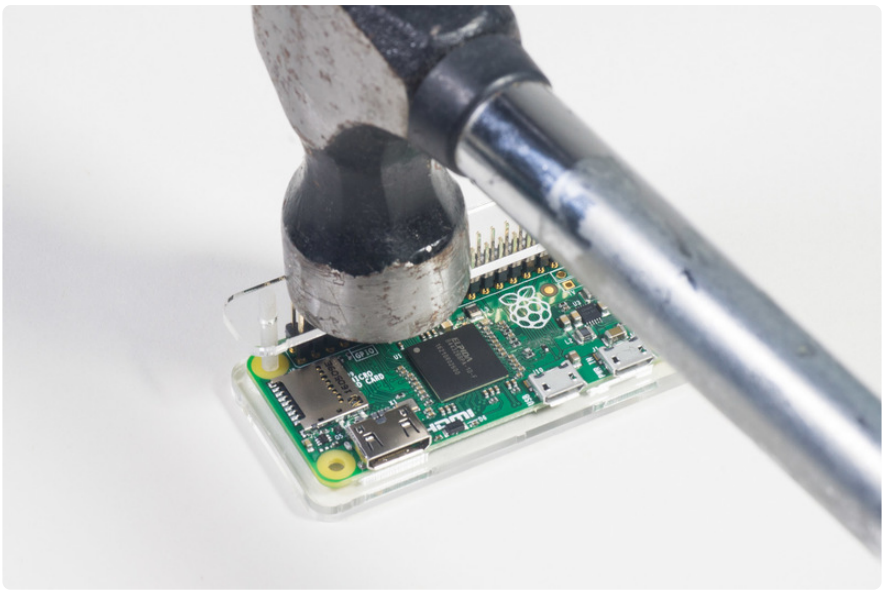


Now, place the last acrylic piece on top of the pins and push it down until it touches them.



Using a hammer, gently tap back and forth on the top acrylic piece to push the pins through. Pushing one end of the header all the way it can cause the other pins to bend when you hammer them in. It's worth taking your time over this part.

Do NOT hammer your headers too hard. Stop hammering as soon as the headers are firmly in place.



Step 2: Burn image to SD card

Next step is to burn our custom image onto the SD card. This image is a custom version of RetroPie / Emulation Station with some free or open source games pre-loaded, and set up to work with the Joy Bonnet.

Click the button below to start downloading the image. This is a large file and may take awhile!

Download Custom Image

https://adafru.it/yfl

While that image downloads, go ahead and download Etcher. A free piece of software that will easily allow you to flash the image onto your SD card. Head to Etcher.io (https://adafru.it/sOe) and download/install the correct version for your operating system.

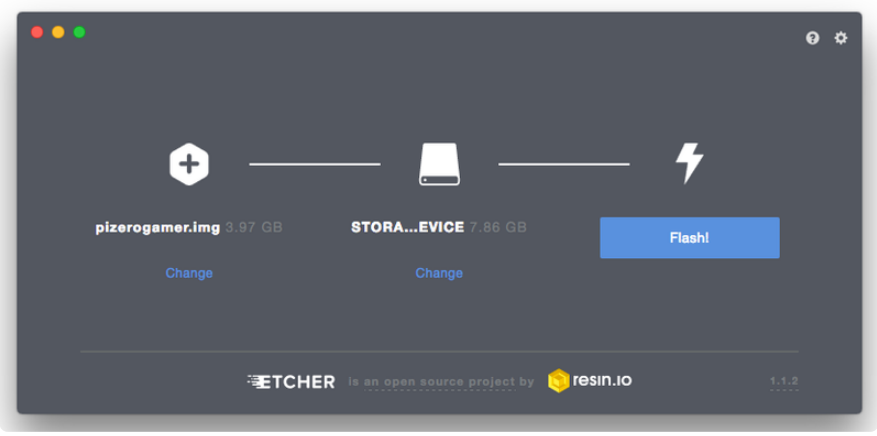
Once the custom image file has downloaded, you will need to extract it. The file is a .rar file, so if you don't have any way to extract that file type, see below.

For Windows computers, use 7-Zip to extract the .rar file (https://adafru.it/dYy).

For Mac computers, use The Unarchiver (https://adafru.it/zad).

Flash!

Once you have extracted the .rar file, you should see a file called **pizerogamer.img**. Go ahead and open up the Etcher app. Click the Select image button and find the **pizerogamer.img** file. Then pull the micro SD card out of the 8GB SD card and insert the micro SD into the micro SD card reader provided. Plug this into your computer and Etcher should automatically find the drive. If not, click the Select drive button and find the SD card. Then click the Flash! button.



This can take some time to flash. While you wait, you can install the case onto your Pi Zero. Snap the Pi Zero into the bottom of the case, then put the top on. Once you have that done you can install your Joy Bonnet over the case like this:



Once you get the Flash Complete! screen in Etcher, go ahead and remove the micro SD card from the reader and install in your Pi Zero (there is an opening in the case to slide it in).

Support Your Joy Bonnet

Thanks to a hot tip from Adafruit Forums member cvadillo (https://adafru.it/fEw), you can take the extra piece of plastic from the case that you removed over the header pins, and use that to support your Joy Bonnet. Just slide it under the Joy Bonnet like so:



And now you are ready to hammer away on those buttons without worrying about causing stress on your hammer header connection.



Step 3: Play!



First, install the micro SD card into the Raspberry Pi Zero. Then, plug in the HDMI cable to a monitor or TV. You will need to use the mini HDMI side of the cable on the Raspberry Pi Zero, and the full size HDMI for your TV or monitor. Now, use the included power adapter and plug it in to the 'PWR IN' port on the Raspberry Pi Zero.

You should see it almost instantly start to boot up into the RetroPie system. Give it plenty of time to fully boot up and you should be able to scan through all of the available emulators and we have included some free games to get you started.

Adding Games

If you want to add games to your tiny new gaming system, load them up on a USB drive as instructed here. (https://adafru.it/yfK) Then, using the included micro USB adapter, transfer them using the USB port on the Raspberry Pi Zero labeled 'USB'.

AdaBox Upgrade: Haunted Portrait



With the help of Adabox 005 parts, John Park built this super creepy haunted portrait project.

> You can make a seemingly innocuous portrait come to life using an ornately framed flat panel TV powered by a Raspberry Pi. With proper lighting, it will look just like a painting, but every so often, the portrait subject's eyes will shift their gaze ever so slighting, sending chills up the spines of your unsuspecting victims, er, friends.
>
> You'll use a hidden Raspberry Pi Zero as the image playback device to drive the TV over HDMI. Plus, you'll have a set of controls available using the buttons and thumbstick of the Joy Bonnet so you can pause and start the show, and more!

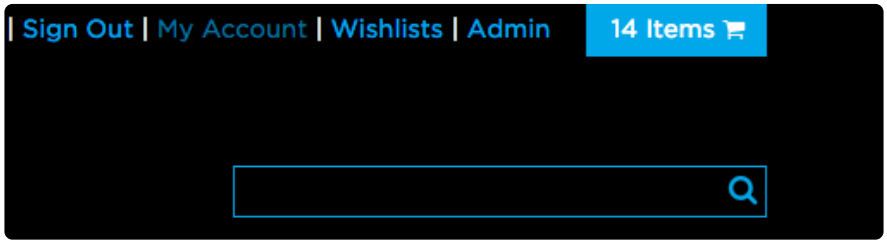
Check out the full guide here! (https://adafru.it/zfd)

Need Help? Questions?

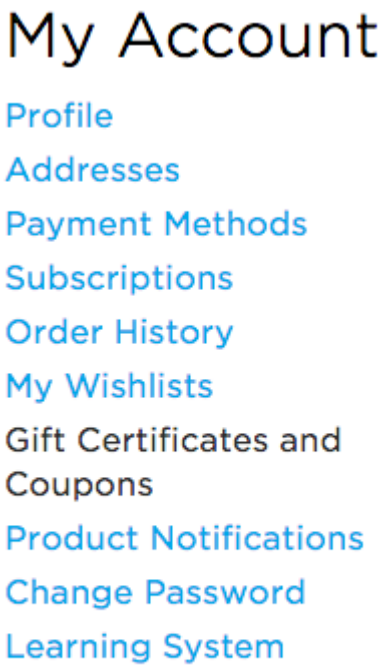
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