

The Gonzo Pi Philosophy: Filmmaking, Unchained

The Gonzo Pi isn't just a camera—it's a palm-sized, Raspberry Pi-powered beast built for storytellers who want to dive headfirst into their world and come out with a film that's as real as it gets. It's not about perfection; it's about truth, immediacy, and creativity unleashed.

The Tree of Creation: Every Take Matters

At the heart of Gonzo Pi is its unique approach organizing your work: the film/scene/shot tree directory structure. Think of it as a blueprint for your scenes and films. Simple yet so powerful that your camera becomes your studio. Every film you start is a new root folder. Within it, scenes and shots branch out as subfolders, and each shot holds your raw takes with eventual cut and effect pointers. Every edited take becomes a new take and every removed take is in a specific folder named `yourfilm_onthefloor`. Removing takes from this specific folder is like sweeping the floor and your takes are permanently removed.

Freedom Through Open Source

The Gonzo Pi is open-source because creativity shouldn't be locked behind proprietary walls. Its 3D-printed body, Raspberry Pi core, and customizable software invite you to hack, mod, and make it your own. Want to mount it on a drone? Make it waterproof? Add a bizarre lens from a 1970s thrift shop? Go for it. The Gonzo Pi is a canvas for your imagination, not a walled garden.

Who's This For?

You. The dreamer, the tinkerer, the storyteller who doesn't need a Hollywood budget to make something real. Whether you're a coder rigging multi-camera setups or a newbie just pointing and shooting, the Gonzo Pi meets you where you are. It's for anyone who believes a story is worth telling, no matter how raw or unpolished.

In the spirit of gonzo, the Gonzo Pi dares you to grab it, run into the chaos, and come back with a film that's unmistakably yours.

Technical Section: Getting Started with the Gonzo Pi

Now that you're pumped about the Gonzo Pi's vibe, let's get it up and running. This section covers the basics of setting up your hardware, installing the software, and understanding the film/scene/shot/take tree that makes the Gonzo Pi so intuitive. No tech degree required—just a bit of curiosity and a love for filmmaking.

Hardware Setup

The Gonzo Pi is a compact, customizable filmmaking machine. Here's what you'll need to build one:

- Raspberry Pi 4B: The brain of the operation. (A 3B+ or 3B works too, but 4B is the standard.)
- Sony IMX Camera Sensor (12.3MP): Captures crisp, vibrant footage.
- C-Mount and CS-Mount Lenses: Pick a lens for your style—vintage, wide-angle, or quirky. C-mount adapters are widely available.
- 3D-Printed Body: Download the STL files from gonzopi.org and print the case. It's designed for easy assembly and modding.
- MicroSD Card and an External USB3 SSD Hard-Drive: SD card is for the brainz and the External Hard-Drive is for storing your films.
- Power Source: 7800mAh li-ion Battery pack (5-6h of filming)
- Optional Add-Ons: HDMI display for a bigger view, USB sound card for better audio, or a viewfinder for precision.

So how does it work in detail?

Let's start with how to control it.

Control the GonzoPi with a keyboard or through the network or with physical buttons; Enter, Up, Down, Left, Right, Record, Retake, View and Remove.

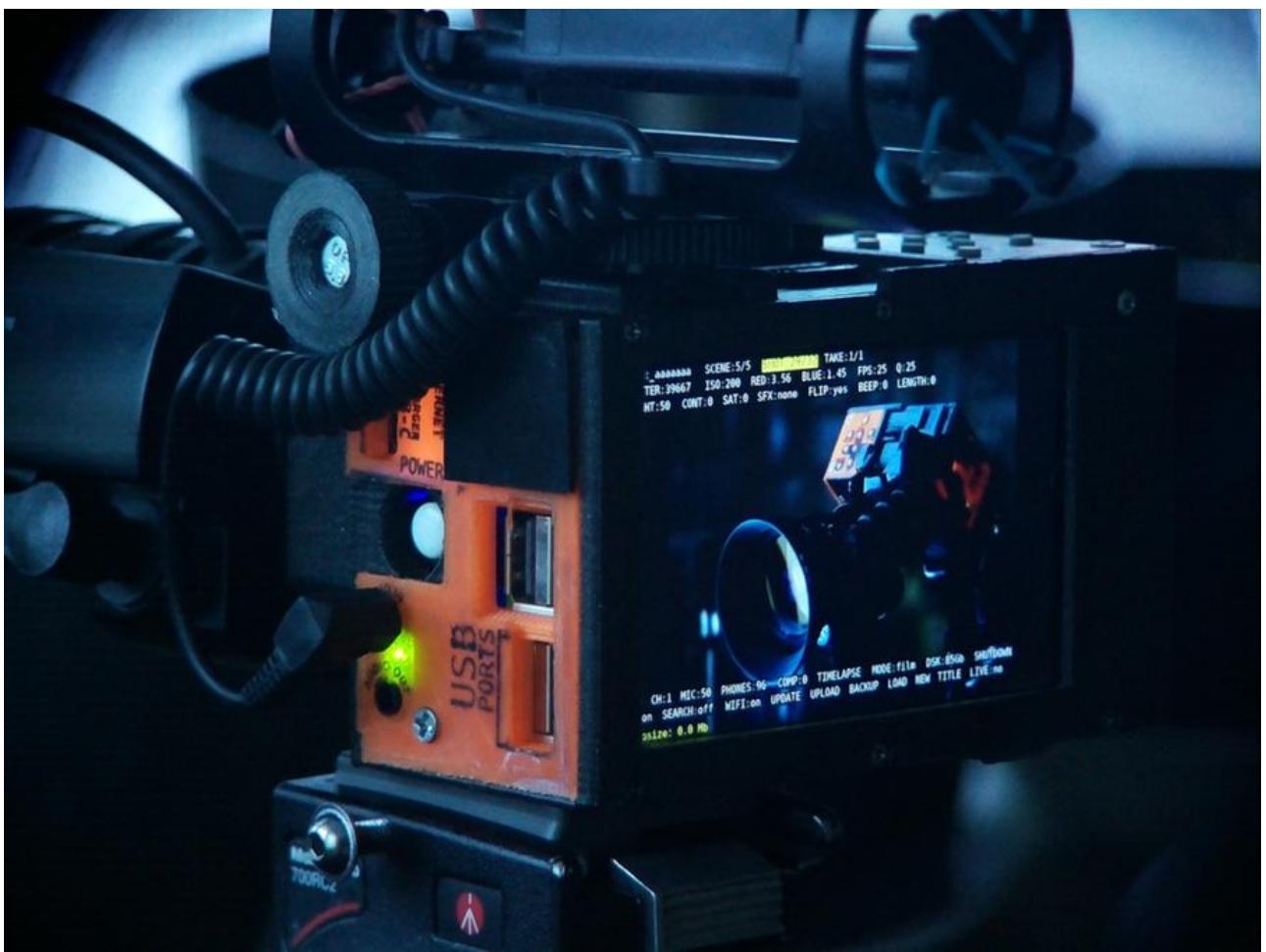


Figure 1: Gonzo UI



Figure 2: GonzoPi UI

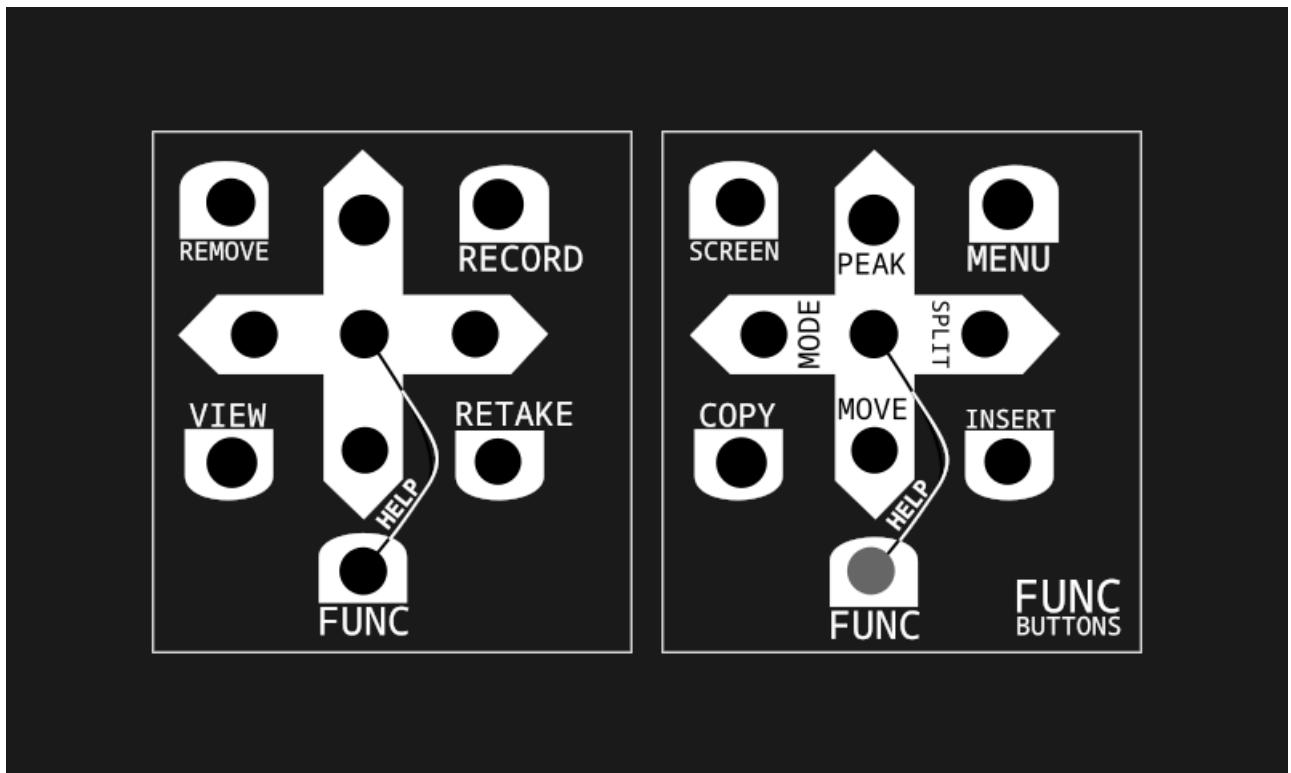


Figure 3: Buttons

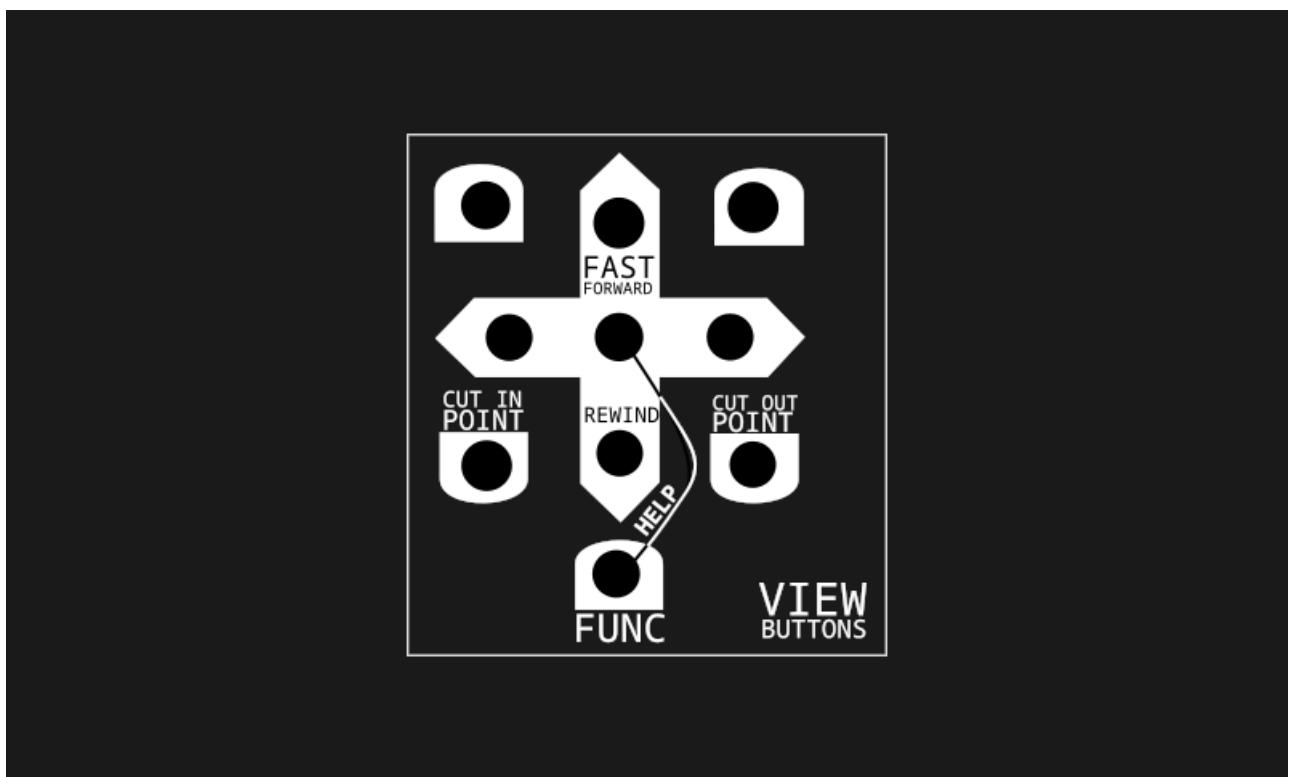


Figure 4: View Buttons



Figure 5: Wireless keyboard

Keys

Keyboard

With keys up and down you change a specific setting, for example shutter speed. With keys left and right you change what settings to change. With view, you can view the last shot or if you have a specific scene highlighted the camera would automatically glue all shots together and play that scene for you, same goes for film. With remove you can remove a specific take, shot, scene or film. With the retake button you retake a bad take, this is how the camera keeps track of your good takes. The last take is always the chosen one.

Special keys on the keyboard (CAPITAL):

H = Hide / Show Help

C = Copy scene/shot

M = Move (as in cut and paste) scene/shot

I = Insert empty, copied or cut scene/shot

S = Screen On / Off

Spacebar / PageUp = Rec / Stop

PageDown = Retake

Tab = View

A = Hide / Show Menu

How to make a film from many takes?

It's very simple and intuitive. Press view button while a scene is selected will glue all last takes of all shots in that scene together and play it. Press view while a film is selected will glue all scenes in that film together.

And multitrack audio dubbing

Pressing enter/middle button on a film, scene or shot will take you to a multitrack dub settings menu. Here you can press record to begin a new audio dub track, you can have as many dub tracks as you need. Next time you view your shot, scene or film it will be mixed in.

Retake

After recording, press record to make next shot or press retake and you'll be filming a new take, the last take in a shot is chosen when viewing a scene or the whole film. Hint! pressing record while browsing existing takes, shots and scenes will take you to the last shot in that scene. Pressing retake will do just that, a retake. Makes perfectly sense, right? Fiddle around with it, you'll totally get it.

Menus

A short explanation of all the settings and why they are where they are.

Film, scene, shot and take

The idea of the workflow is: film only the essential, you can merge your shots of a scene and view it on the spot and do a retake if you need to fix something rather than filming a bunch and fixing it later while editing. When you get the hang of it there won't be not much editing later.

Dubbing

If you press enter while you've highlighted the film name or a scene you'll be entering dub settings menu. (ADD:d:1.0/o:1.0) this indicates the volume of the (d)ub to the previous (o)riginal mix. So, for example if you want the dub volume to be 50% of the previous audio, the settings would look like this (ADD:d:0.5/o:1.0). A good all-around background music volume level is only 10% so it would look like this (ADD:d:0.1/o:1.0). The other setting is fade in and out in seconds (in: 0.5) (out: 1.0) would be half a second in and a second out. Now if you press enter while the ADD is highlighted you'll be dubbing. You can change the settings later if you come back to the menu.

Shutter, iso, red, blue

Shutter and iso are well know basic camera concepts. With red and blue you control the colors. If you press enter while on any of these then it will go into auto mode and if you press it again it will go back to manual mode with the current auto settings. I'm using this feature to quickly find a reasonable good value before I'm locking and tuning the settings manually to my likings. Cuz you always will know better than the robots!

Bright, cont, sat

Color grade on the go with brightness, contrast and saturation. You will probably have to play with theses to figure out what you want. Remember that as you're making your film ready while you're shooting it take by take, there's no color grading later on so you'll have to settle on your color grade before you film. To get that good old spaghetti western look go with the contrast at -19.

VFX

Some realtime effects like invert, negative, film grain, solarize, denoise, colorpoint, colorswap, posterize and blur

Flip, beep, lenght

If you go gonzo, flippin it is the way to go! beep is a countdown timer from the moment you press rec or retake to when it actually starts filming. Lenght let's you put in the lenght of your take before you actually start filming. Both of these are very useful if you film action alone and can't reach for the buttons.

Mic, phones, comp

Control teh level of your mic and headphones. Comp is a basic compressor so your message comes across and we hear ya! it's quite harsh at the moment but I like it when it goes craking up abit like in the good old 70s cinema.

Timelapse

(this is not picture timelapse this is video timelapse, working on picture timelapse) Press middle button on TIMELAPSE and you'll be in timelapse menu here you can choose the intervall of the takes, now this isn't really a traditional timelapse, it will instead do a 0.2 sec video at each intervall or it can be set to your likings but 0.2 is good for a traditional timelapse effect. At the bottom of the screen is a calculation of how long the clip will be if you do the timelapse for an hour. I'd say don't over do it! a 10 - 20 sec clip is already quite a stretch but its up to you, you're the movie film director.

Dsk, shutdown, srv, wifi

Disk space, showing you how much of space left on your sd card. Shutdown, when your really done! it's good to do this before cutting the power or otherwise there's a small chance of sd card corruption. Srv is a network server, if your connected to a network and put this on you should be able to go to any browser on any device

and watch your movie films (that is if you've rendered them first), just go to the ip address of your gonzopi (move around the cursor to get updated ip, you'll find it when you've connected it. Press enter on wifi. There it is on the bottom of the screen, looks like this 192.168.1.105). If you press enter on wifi you will be transported to a glorious program called Wicd curses, here you really need to have a keyboard to set up your connections. Hints are down on the screen what buttons to press. To get back into Gonzopi press "q".

Update and upload

Update the camera to the most exclusive version, this is still pretty much a-work-in-progress and as a warning expect some bugs! don't worry I'll be improving things but it takes time. Upload your film to the web, there is a youtube uploader mod you can install but you'll have to do some configs to make it work for you. Details coming soon. Reach out to the matrix room if you're in a hurry..

to get the youtube api secrets `wget https://gonzopi.org/yt/.client_secrets.json`

Load and new

You can have many on going films, load em up or start as many films as you like.

Multi-camera

Press middle button on SRV: to view multicamera options

Blending

Copy a take and choose what take to blend with and hit middle button on BLEND:

Live

Hit enter to select where to push stream (what ip and port) it will then be saved til you remove it with remove button

MUX

When MUX 'yes' mp3 is merged together with the video, it will take a little longer to render but this is essentially what you want to do when you have your film ready and want to share it.

Building, repairing and modding

1. Get the parts
2. Printing the printable parts
3. Wiring
4. Installing software
5. Tested lenses

Get the parts

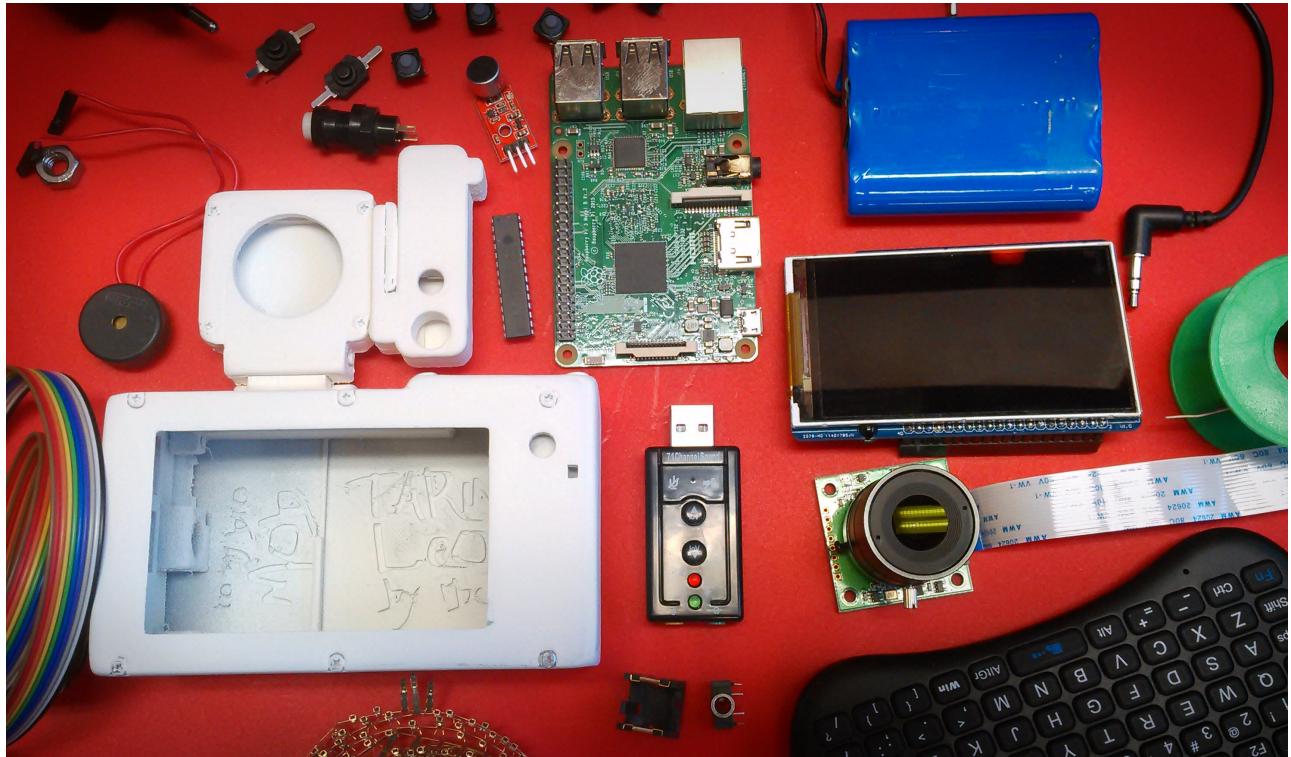


Figure 6: GonzoPi parts layed out (this is a very old Gonzo Pi version)

Here is a list of parts that are recommended, there are other parts that probably will work but requires some hacking.

Raspberry pi 4 B

Price ~40 eur

The heart of GonzoPi. Why Raspberry pi you ask? There are several reasons:

- Huge support.
- The great Debian based os Raspbian.
- Low price.
- Picamera.

Links Raspberry pi site [Buy TME.EU](#)

64 Gb Samsung Evo+ Micro SD

Price ~10 eur

This is a good performance card.

[Aliexpress](#)

Raspberry Pi High Quality Camera

Price ~60 eur

This is the recommended camera module for GonzoPi, 12.3 megapixel Sony IMX477 sensor, 7.9mm diagonal image size, and back-illuminated sensor architecture, with adjustable back focus and support for C- and CS-mount lenses.

Links [Buy Raspberry pi](#)

Pimoroni Hyperpixel 4 inch screen

Price ~35 eur

Bright 4 inch responsible screen. Beware when installing the screen, it's quite brittle!

Links [Pimoroni](#) **Buy** [Pimoroni Farnell](#)

USB via vt1620a sound card

Price ~1 eur

Really cheap usb soundcard. It has been working surprisingly well. Have not tested other cards yet.

Buy [Aliexpress](#)

3.7v 7800mAh li-ion Battery

Price ~17 eur

I have tried several batteries, the adafruit 6800mAh is also fine.

Buy [Aliexpress](#)

Or you can buy 3 pcs of 3.7V 18650 Lithium cells and protect them with an Lithium Battery Protection Board Overcharge Over-discharge.

Aliexpress

Here's a pack with 40 pcs of 2600mAh 3.7V 18650 cells.

Aliexpress

Type-C 5v 2A 3.7V Li-ion battery charger booster module

Price ~2€

Enough juice in this booster charger to run the pi 3b without dropping voltage.

Buy [Ebay](#)

8x8x5MM DIP-4 Silicone Switch Mute Silent button

Price ~2 eur/20 pcs

You can only buy a pack of 20 pcs but these buttons are good and silent! Not necessary if you want to control with keyboard like Rii mini 8+

Buy [Ebay](#) [Aliexpress](#)

MCP23017-E/SP DIP-28 16 bit I / O expander I2C

Price ~1 eur

This will be connected to the screen I2C port. This is not necessary if you intend to control the camera with a keyboard like the Rii mini i8+

Buy [Aliexpress](#)

Piezo electronic buzzer

Price ~1 eur

Very useful for timing shots!

Buy Aliexpress

Latching push button switch 10mm

Price ~5 eur/24 pcs

I use this as the powerbutton. I have tried different versions of safe shutdown buttons for the Raspberry pi but they have not worked as I wanted (they draw power even when Pi is powered off, this is not good). I have solved the problem with a menu button to safely shut down the camera.

Buy Aliexpress

Nut 1/4 -20 UNC 304 A2

Price ~2 eur/10 pcs

This is the standard camera stand nuts. If you never use a stand then you dont need this.

Buy Ebay

Screws M3x12mm

Price ~2 eur/25 pcs

These hold the camera together.

Buy Your local hardware store

Ebay

Screws M3x30mm

Price ~2 eur/30 pcs

These hold picamera-body to the body.

Buy Ebay

Screws 2.2x9.5mm

Price ~1 eur/20 pcs

These hold the camera/mic together.

Buy Ebay

Rii mini i8+ mini keyboard

Price ~17 eur

Wireless control over camera. You will also need this for wifi settings etc. (Recommended) This is one of the best mini keyboards I've tried.

Buy Aliexpress

External USB3 SSD hard-drive

Price ~50 eur

It's recommended to film to external drive.

Parts grand total ~200 eur

Optional parts

Gonzopi viewfinder

This is a 3.5 inch viewfinder for Gonzopi that you can 3d print and make by buying these three parts.

Lens D42 F110mm

Price ~10 eur

[Buy](#) Aliexpress

Rubber Eyepiece

Price ~4 eur

[Buy](#) Aliexpress

Magnets 25mm x 5mm x 1.5mm

Price ~3 eur 10 pcs

[Buy](#) Aliexpress

Printing the printable parts

While waiting for ordered parts lets 3d print the rest of the parts. I recommend printing with a solid 100% infill. Now it is pretty crucial that you have a good calibrated printer so that you don't over/under print. Some parts need to be very precise to work.

You'll find all the 3d parts in a blender file in the 3d folder.

gonzopi-body.stl

gonzopi-button-plate-bottom.stl

gonzopi-button-plate-upper

gonzopi-hdmi-cap

gonzopi-left-side

gonzopi-picamera-body

gonzopi-right-side

gonzopi-screen-lid

Wiring

Installing software

Download latest Raspbian and follow install instructions. Ssh into Raspberry Pi and run:

Go to home folder

`cd /home/pi`

Install git

`sudo apt-get install git`

Git clone gonzopi and then run install script with sudo:

```
git clone https://github.com/rbckman/gonzopi.git  
cd gonzopi  
sudo ./install.sh
```

You're ready to rumble:

`python3 gonzopi.py`

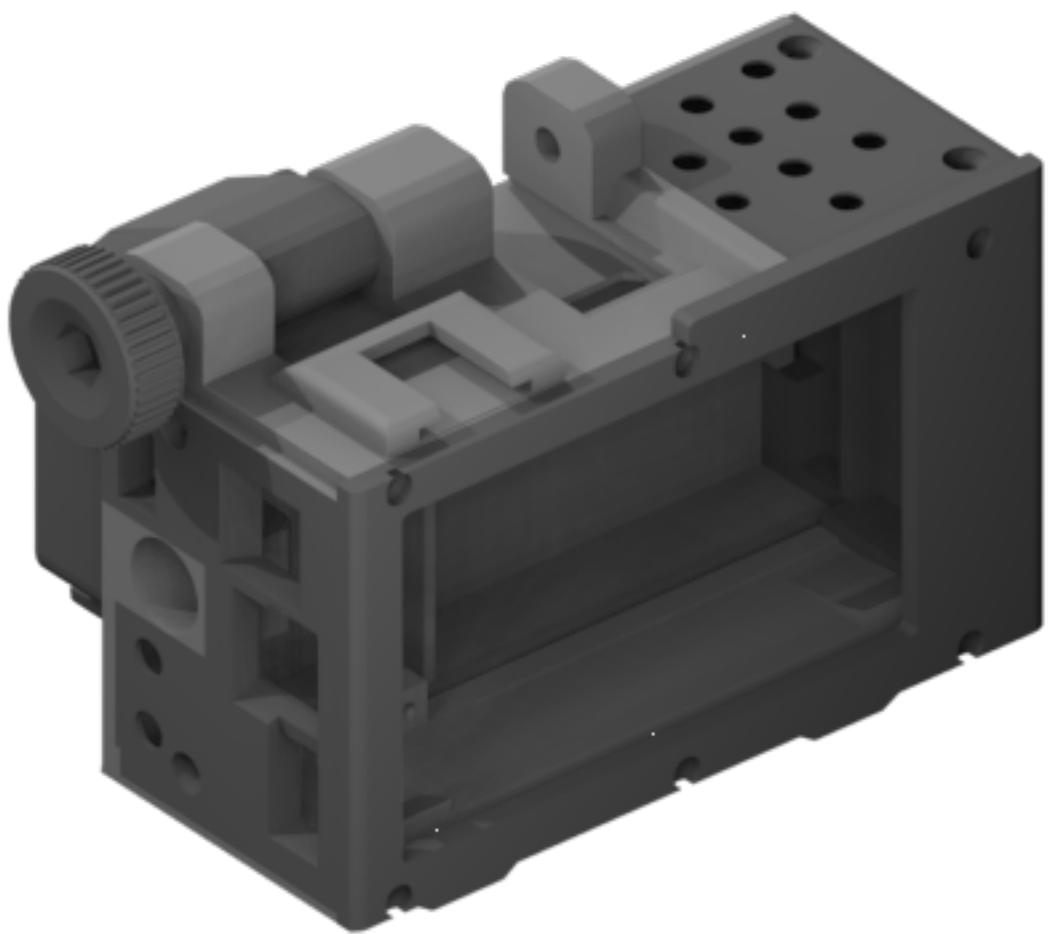


Figure 7: body



Figure 8: gonzopi-button-plate-bottom

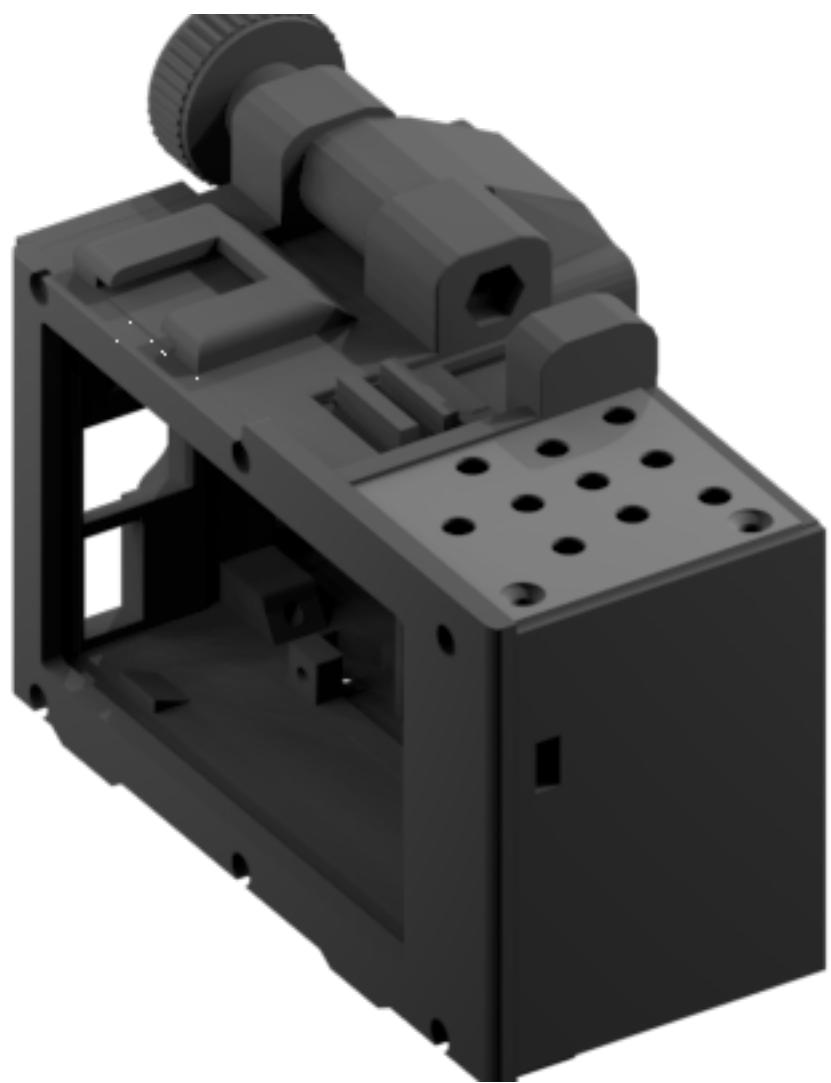


Figure 9: gonzopi-button-plate-upper

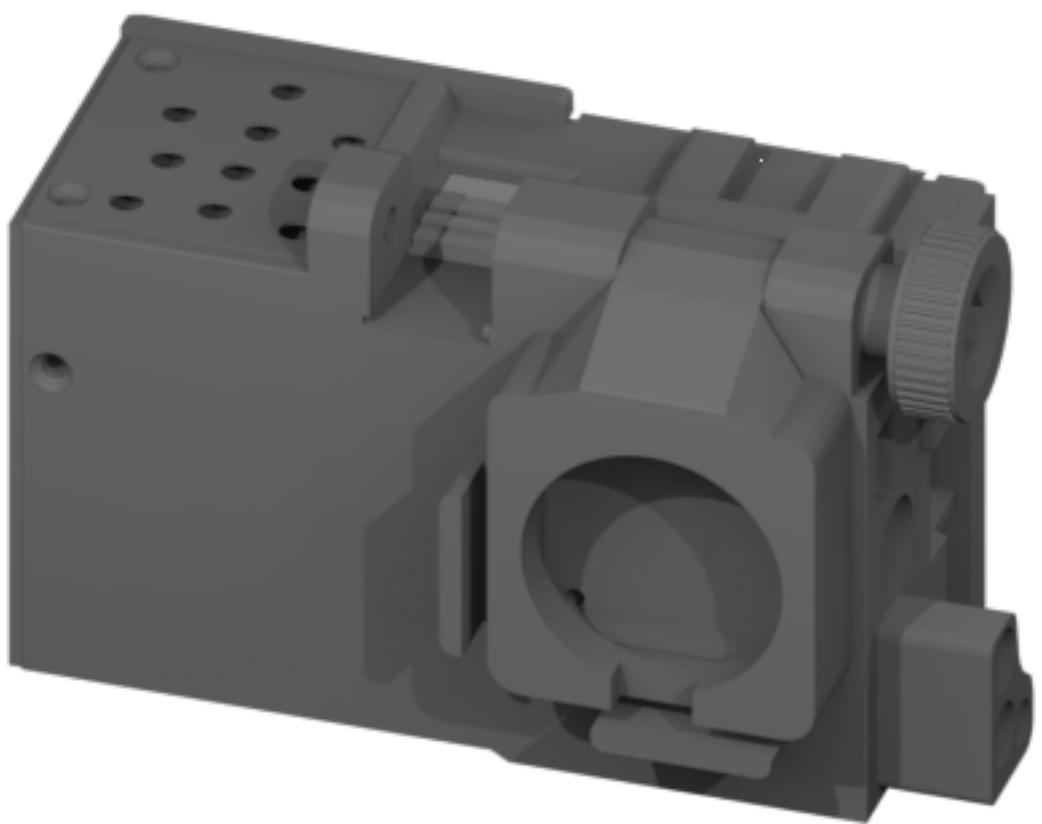


Figure 10: gonzopi-hdmi-cap

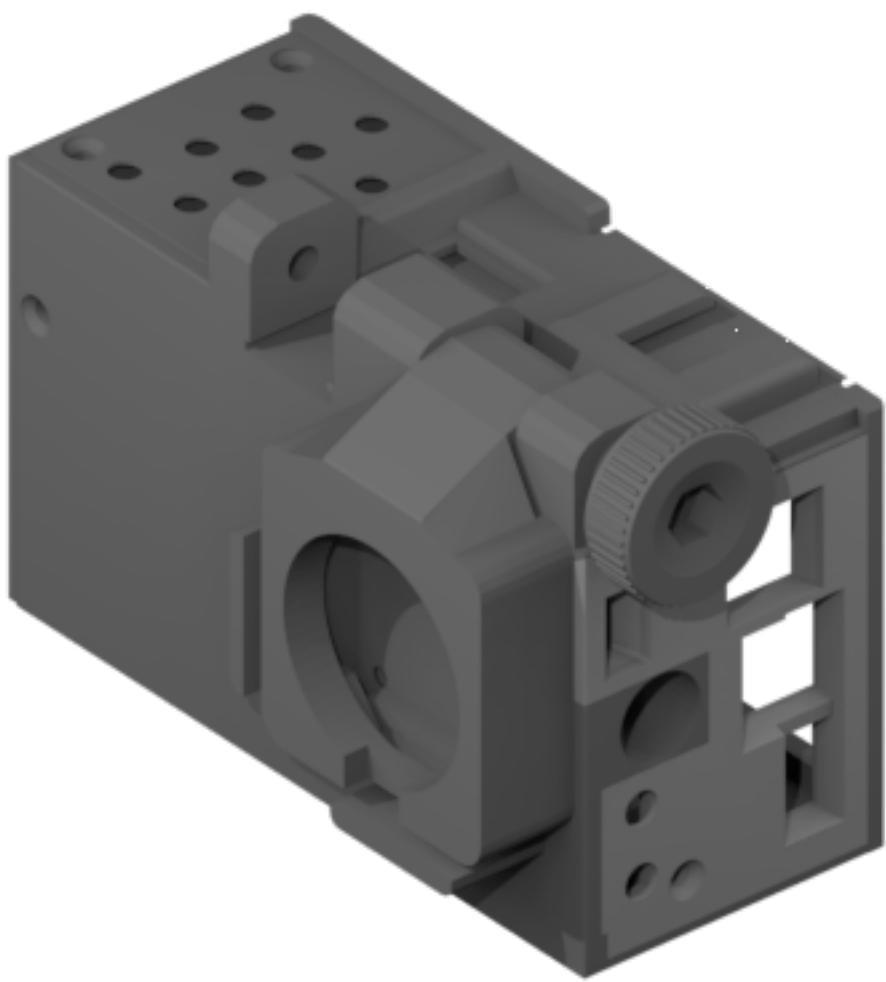


Figure 11: gonzopi-left-side

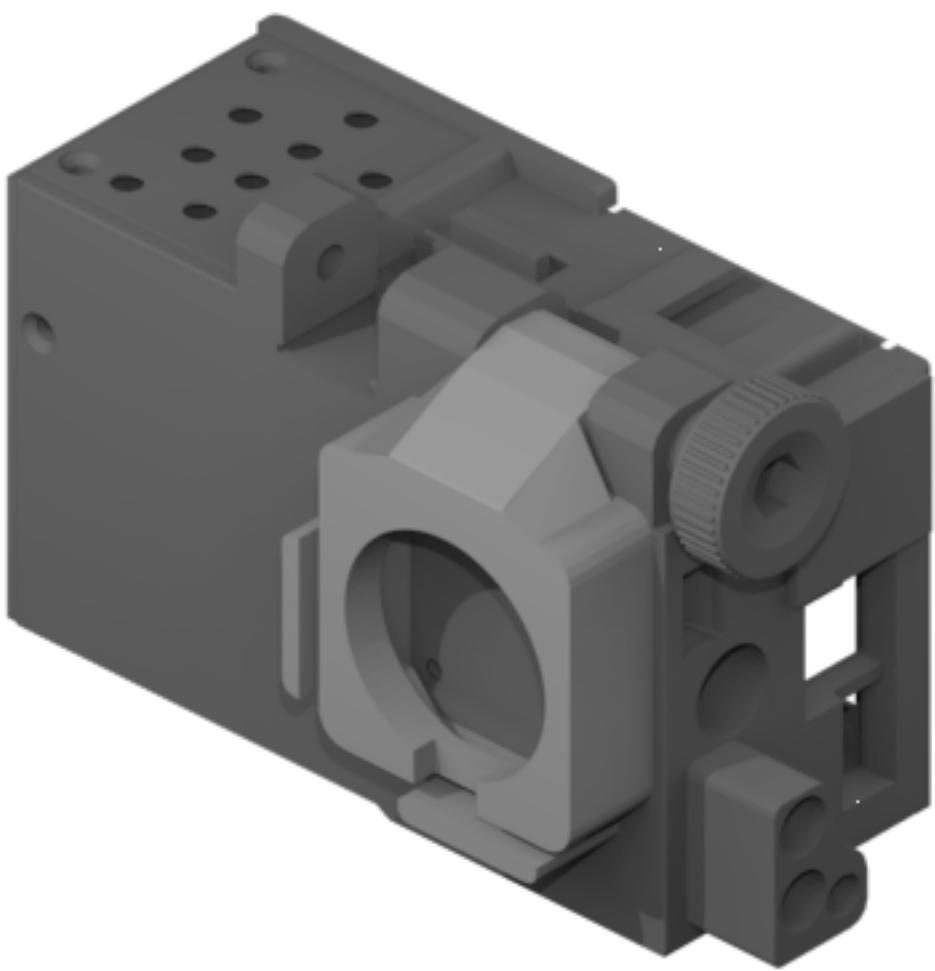


Figure 12: gonzopi-picamera-body



Figure 13: gonzopi-right-side



Figure 14: gonzopi-screen-lid

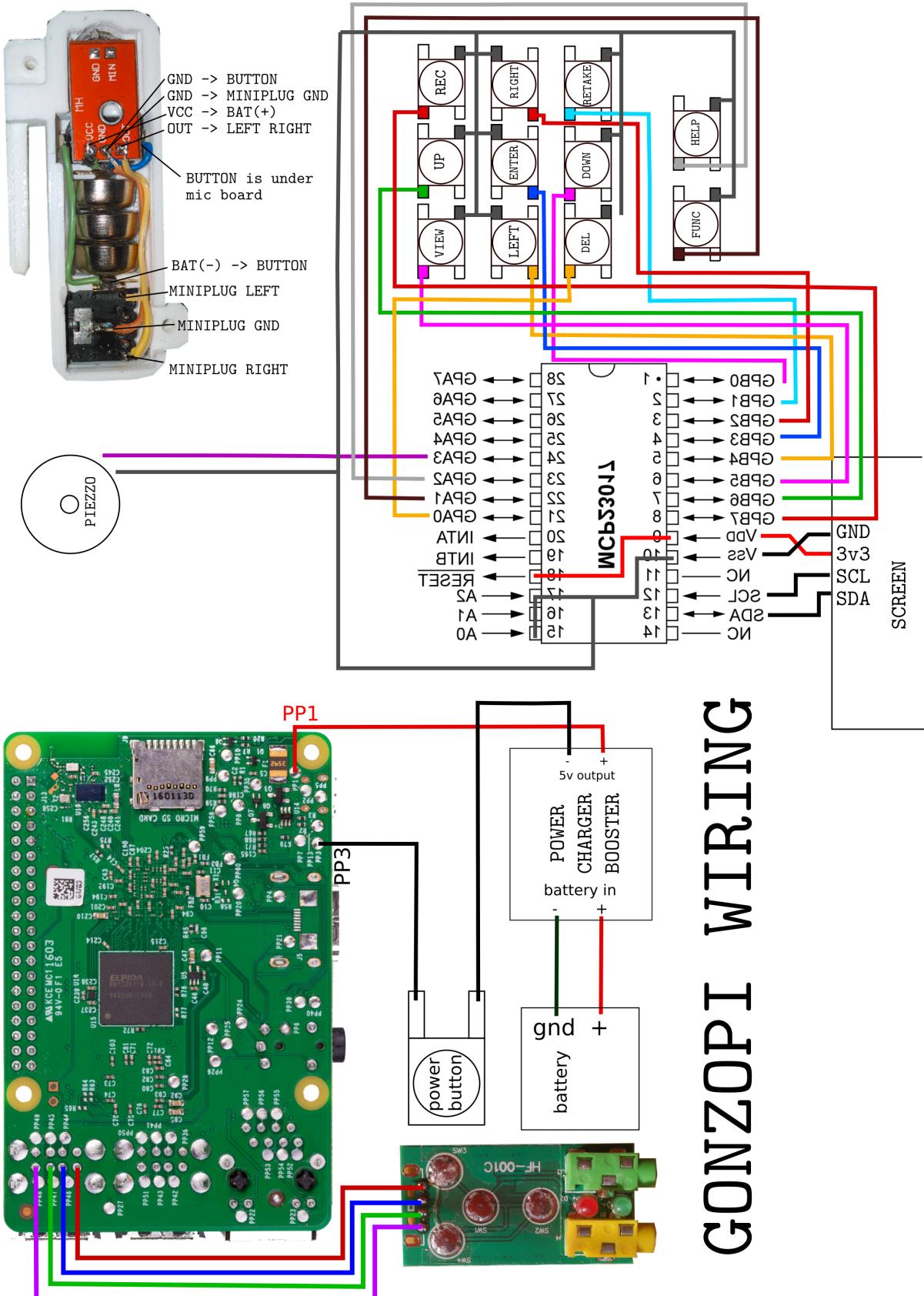


Figure 15: Gonzopi wiring diagram

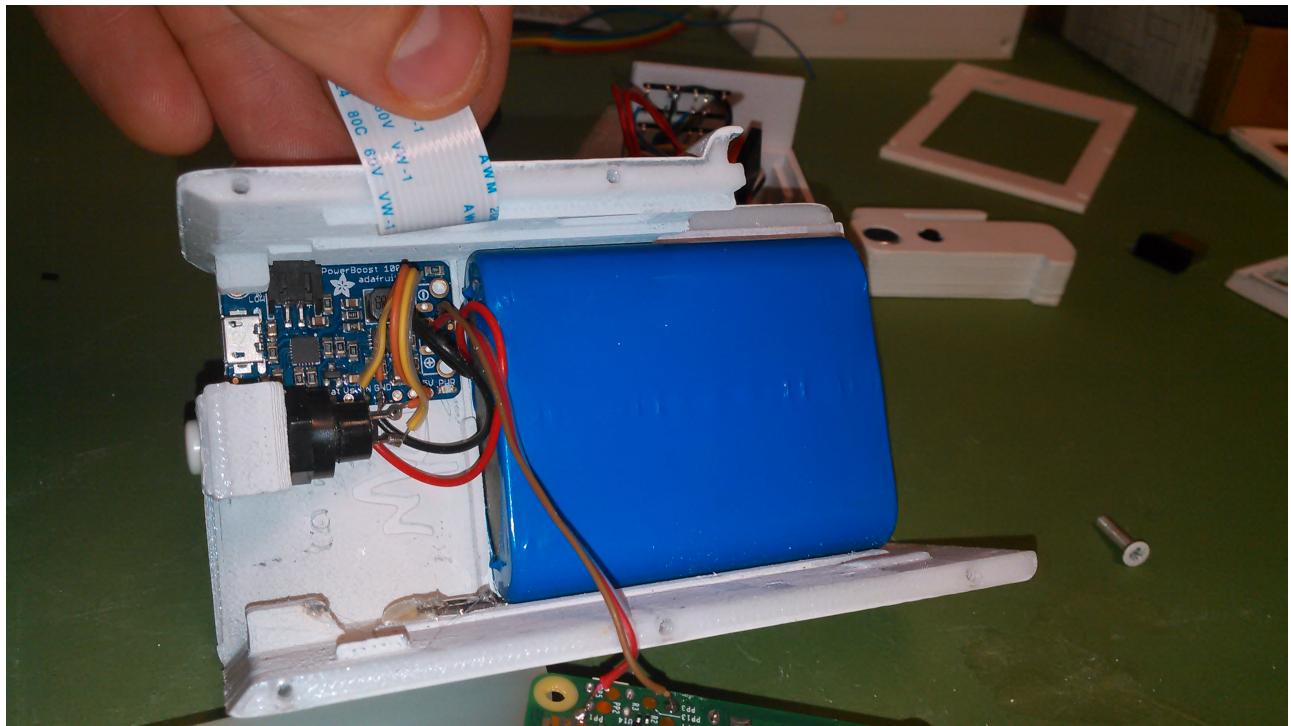


Figure 16: dont use adafruit powerbooster! use Type-C 5v 2A 3.7V Li-ion battery charger booster module

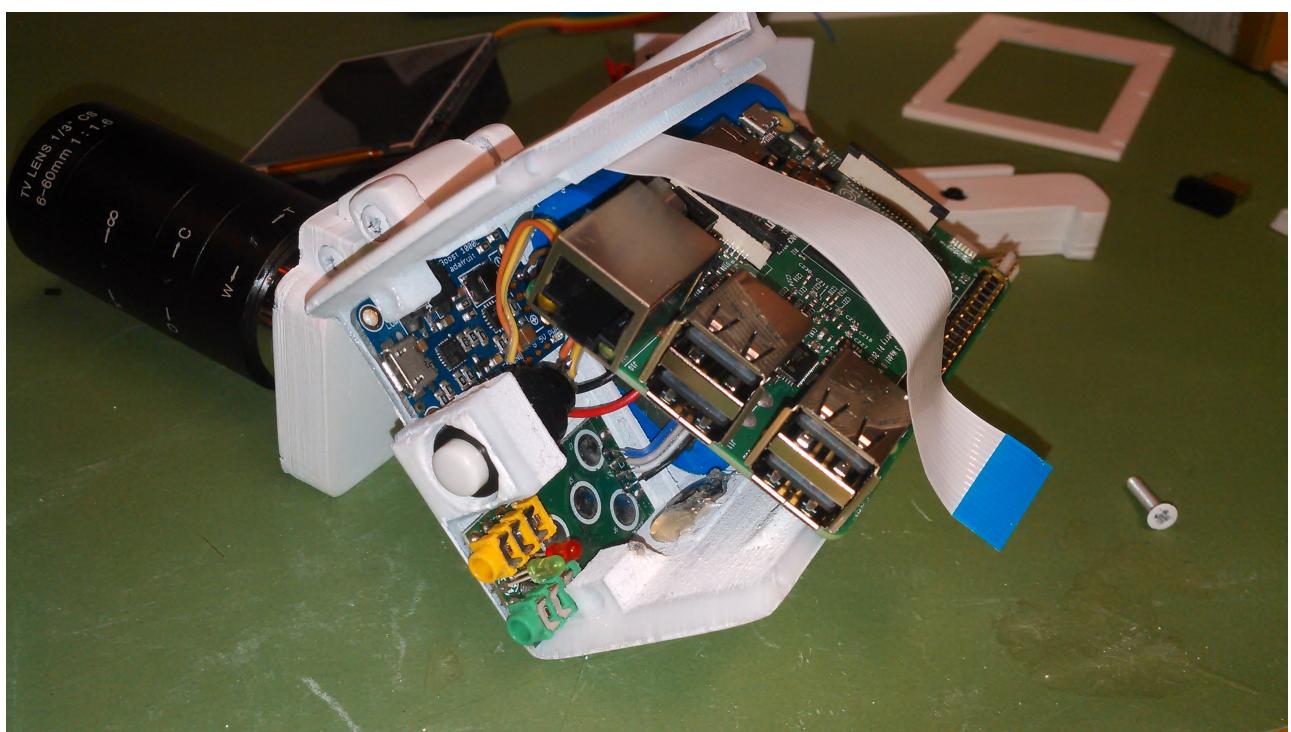


Figure 17: Fitting everything together (very old Gonzo Pi version in this image but the methods are the same today!)



Figure 18: GonzoPi version 0.1

Happy filming!

Tested lenses

Here is what I'm testing right now.

2.8mm 3MP F1.2 CS

Price ~ 6 €

This is a good wide all around lens. Recomended! Aliexpress

2.5mm 3MP F1.2 CS

Price ~ 6 €

This is an even wider lens. Seems to be the same manufacturer. Aliexpress

Yumiki 6-60mm 1/3" CS Lens CCTV Lens IR F1.6 Manual Zoom Manual Iris

Aliexpress

Camera Lens 2.8-12mm Varifocal

This lens is good. Will write a longer review once I have more filming hours.

Aliexpress



Figure 19: Should be looking like this once finnished