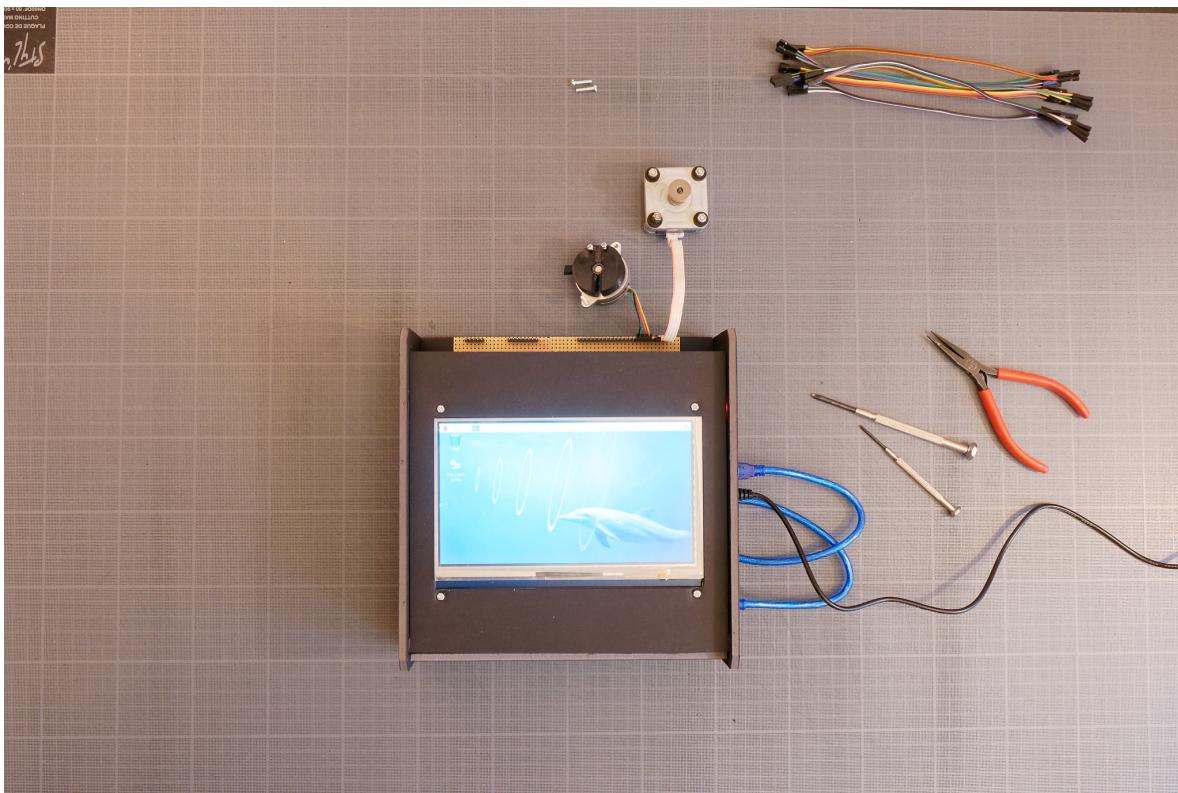


ELK-box

Introduction



Prerequisite	None
Duration	1/2 day
Cost	800 - 900 €
Open-source License Software	BSD3 License
Open-source License Hardware	EchOpen License

ELK-box is the first step of the ELK project by echOpen. The idea of ELK (EchoLab Kit) project is to capitalize on all the previous contribution of the community and design an open-source modular hardware "EchOpen Lab Kit" which enable everyone to make their own acoustic, software and firmware experiment. We want to develop a full range of components compatible and combinable with one another in order to build a custom lab. ELK-box is the core module conceived as a test bench on which you can plug devices such as 2D table, custom ultrasound card, custom transducers...

Design files

The only design files needed to build ELK-scope are the casing files as all the other component are mechanic or electronic parts available on the market.

Title	Original files	Reading files	Design tool
Case	OpenSCAD	OpenSCAD	Fusion360

Casing	Link to originals	Link to reading files	FreeCAD
Title	Original files	Reading files	Design tool

Original files: files used to make modifications on the project

Export files: files that can be opened and imported by other programs or softwares (STEP, IGES...)

Reading files: files used to study or produce without modifications (PDF, STL...)

Software and firmware

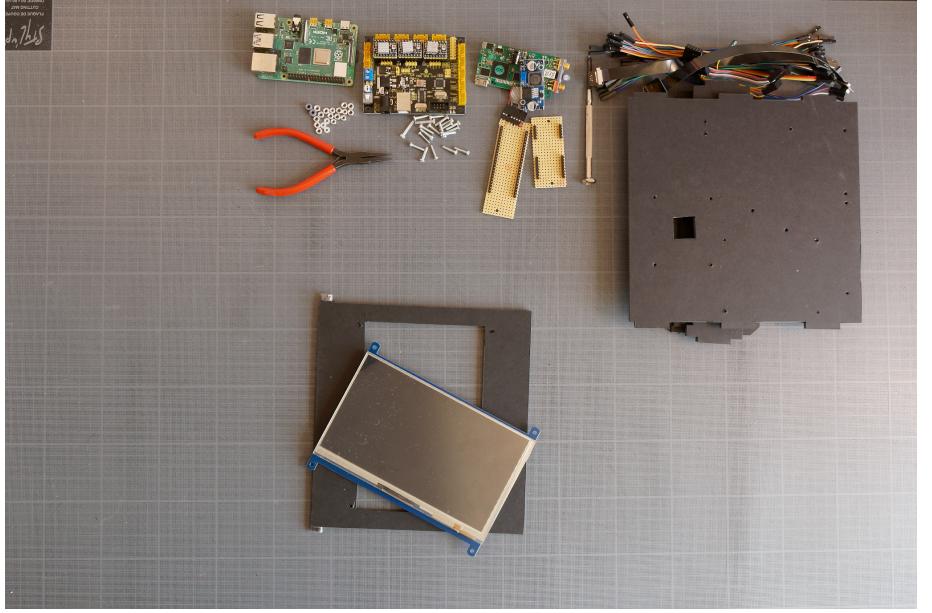
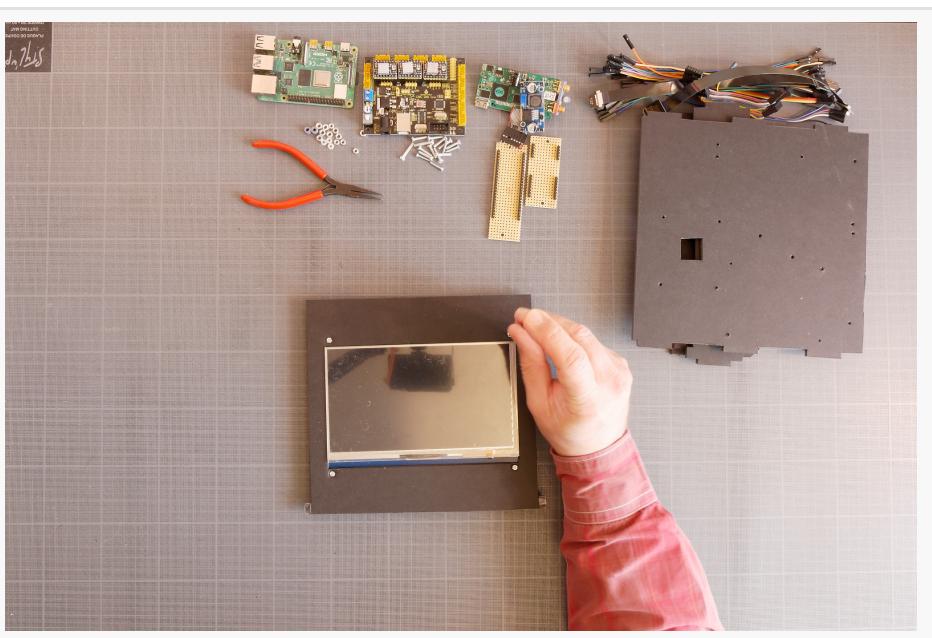
Source code	Compilation process	State
ELK-box/soft/src	Python 3	In progress

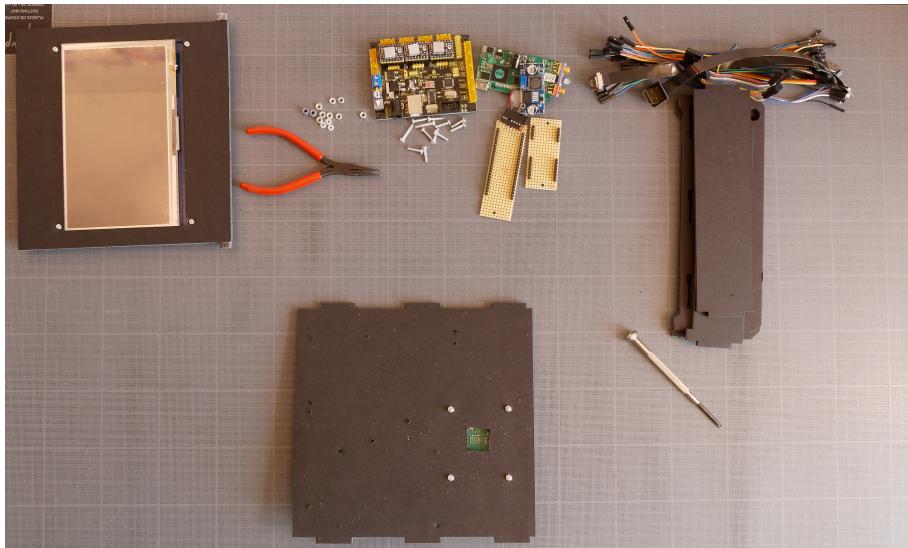
Nomenclature

Designation	Quantity	Description	Supplier	Price/unit (€ TTC)	Datasheet
Software Controller	1	Controller Rpi - 4GB	LetMeKnow	69	Link to datasheet
Touch screen	1	Screen waveshark 7 inch Capacitive Touch Screen HDMI LCD 1024 * 600	Amazon	60,96	Link to datasheet
Ultrasound card	1	Ultrasound card open-source	echOpen	600	
CNC card	1	CNC card KEYESTUDIO Grbl Blister CNC carte contrôleur DIY	Amazon	21,59	Link to datasheet
5V Down power supply	2	5V regulator DFR0571 3 A maxi	GoTronic	3,7	Link to datasheet
12V Power supply	1	12V Power supply			
Connections	1	HDMI display	Adafruit	5,88	https://www.adafruit.com/product/3549
Connections	1	HDMI RPi	Adafruit	5,88	https://www.adafruit.com/product/3557
Connections	2	Wire 20 cm	Adafruit	1,76	https://www.adafruit.com/product/3561
Connections	2	μUSB display and RPi	Adafruit	4,48	https://www.adafruit.com/product/4105
Connections		PCB connector			
Casing		Casing			
Fasteners		Fasteners			

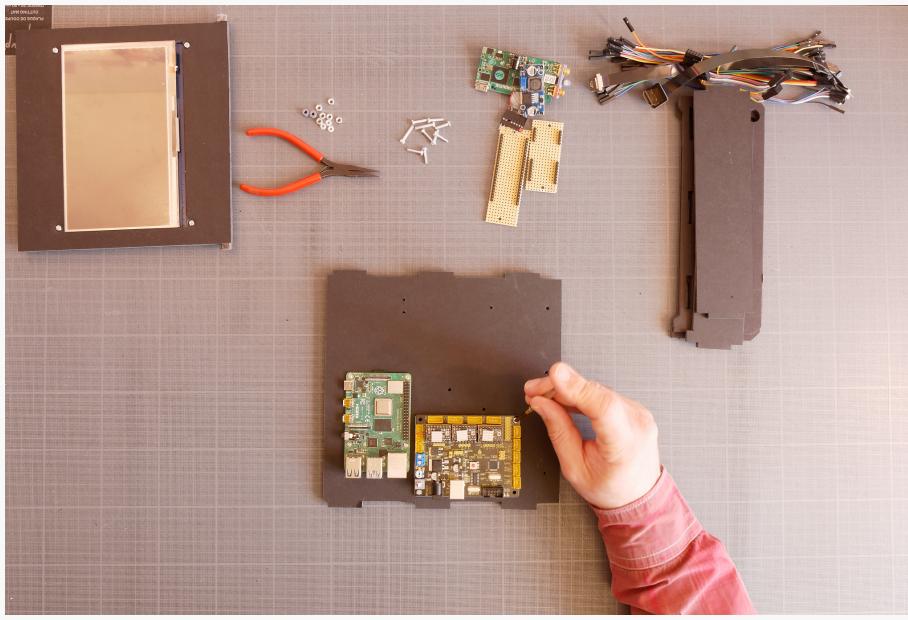
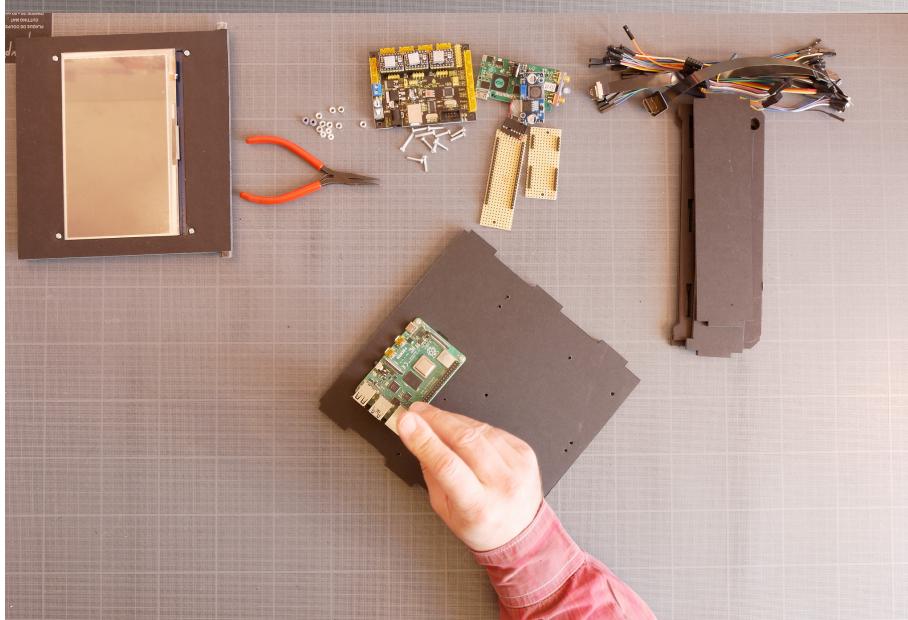
Assembly

List of tools needed	Where to find it?
Screw driver	(Optional)
In Progress...	

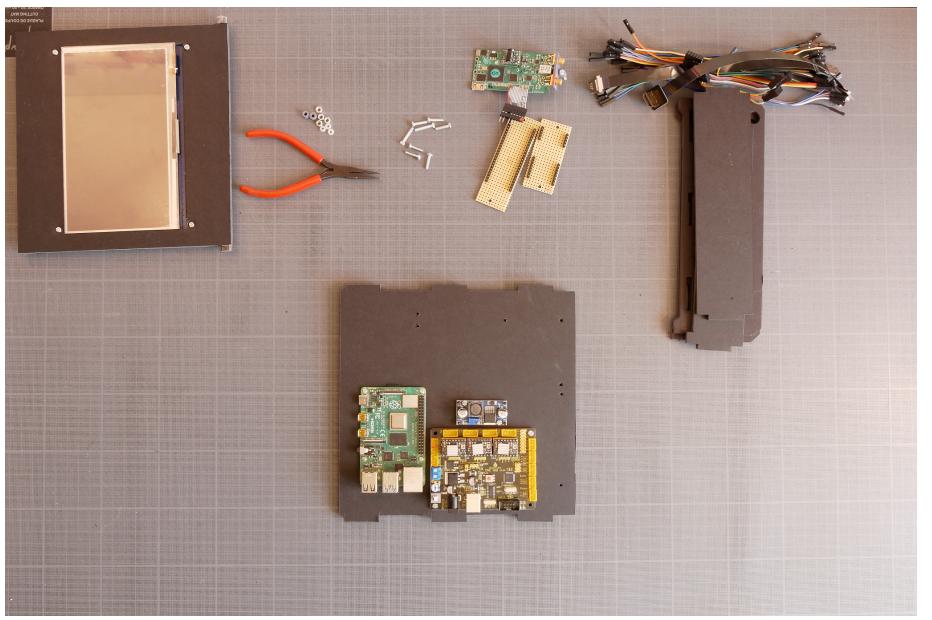
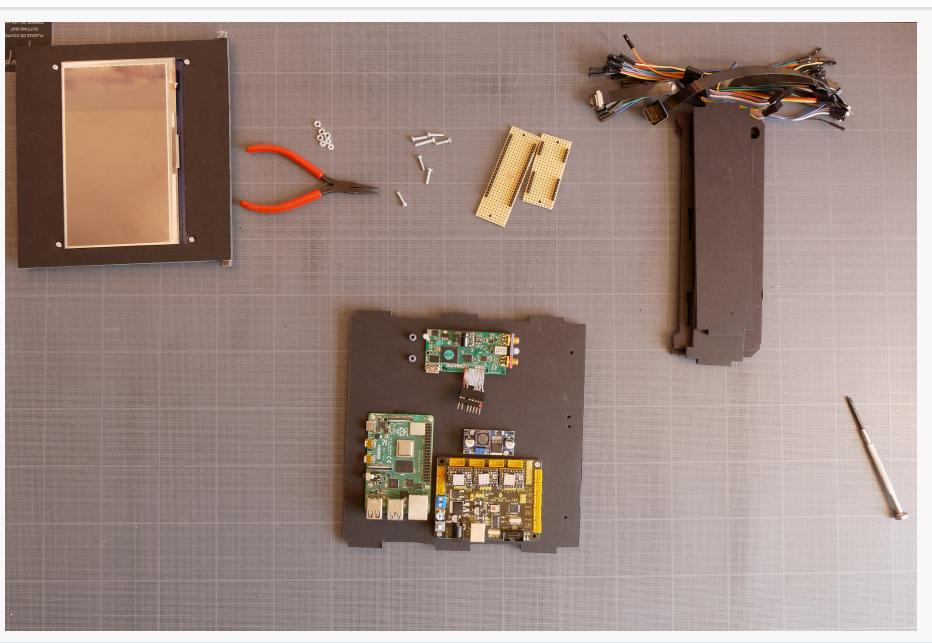
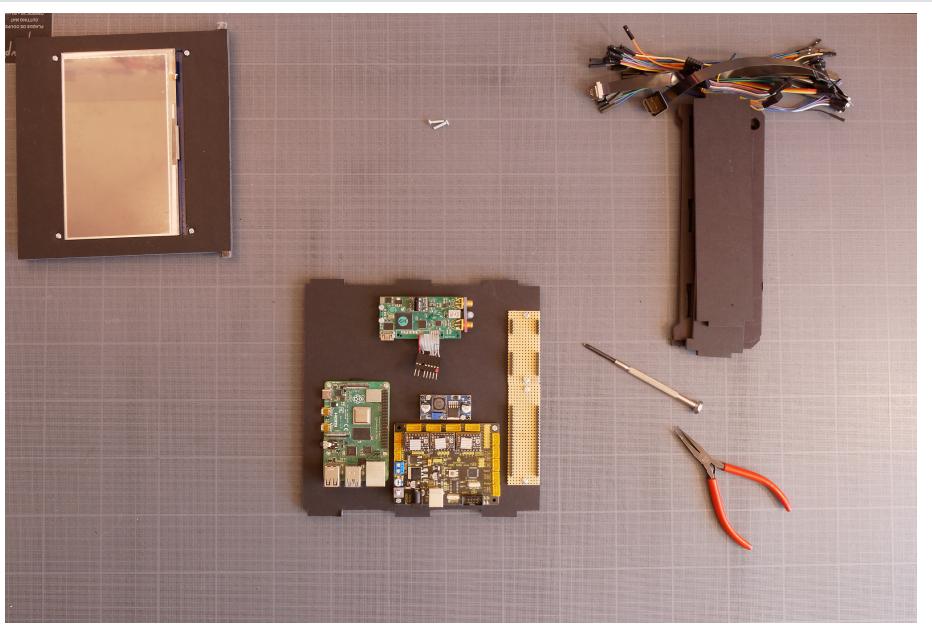
Picture	Assembly instructions
	<p>Hardware components We are using M2.5x12 screws and M2.5 nuts for all the assembly</p>
	<p>Mount the touch screen on the top part of the box</p>

Picture**Assembly
instructions**

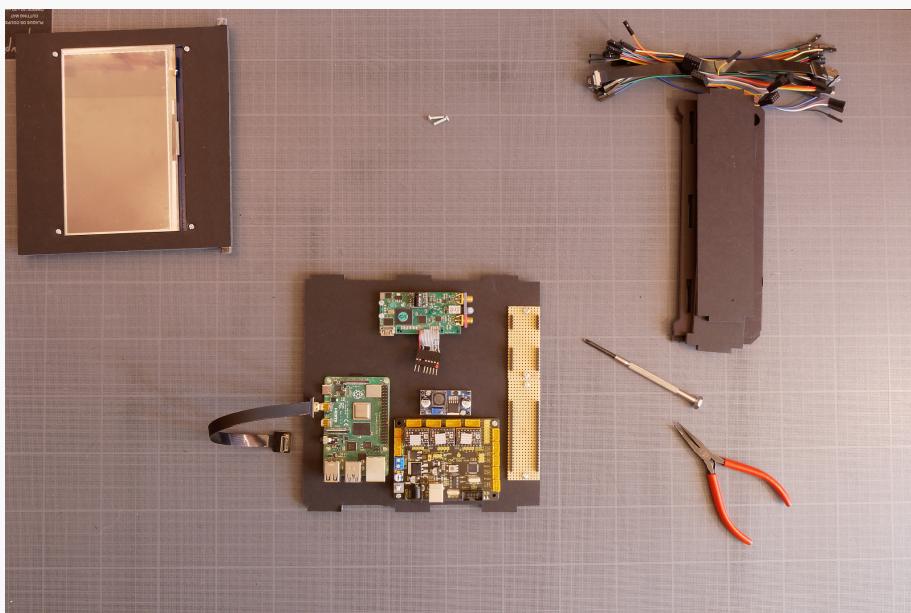
Mount the Raspberry Pi controller on the base of the casing



Mount the CNC card

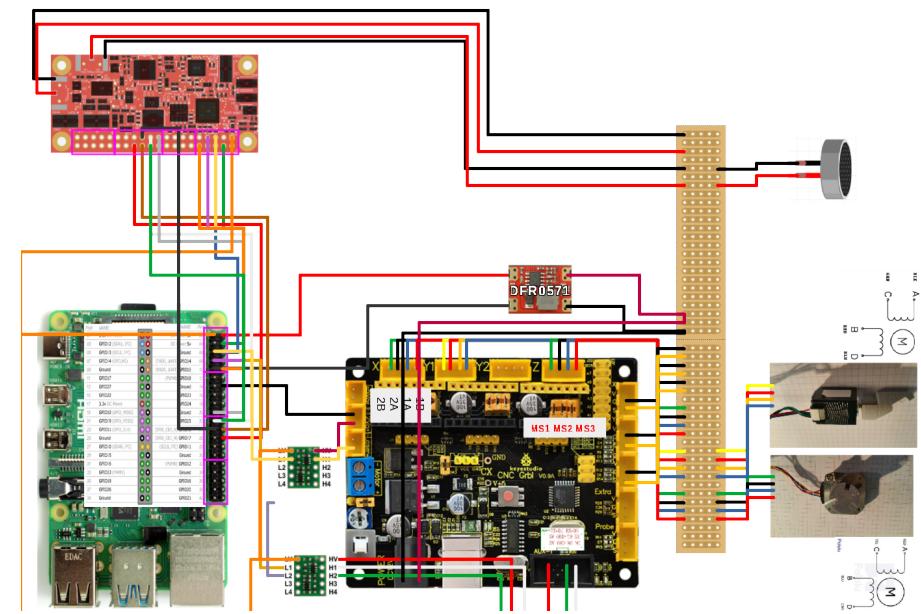
Picture	Assembly instructions
	<p>Mount the 5V Step down power supply</p>
	<p>Mount the ultrasound card. This model is a US SPI (can be replaced by another open-source model)</p>
	<p>Mount the connector board</p>

Picture

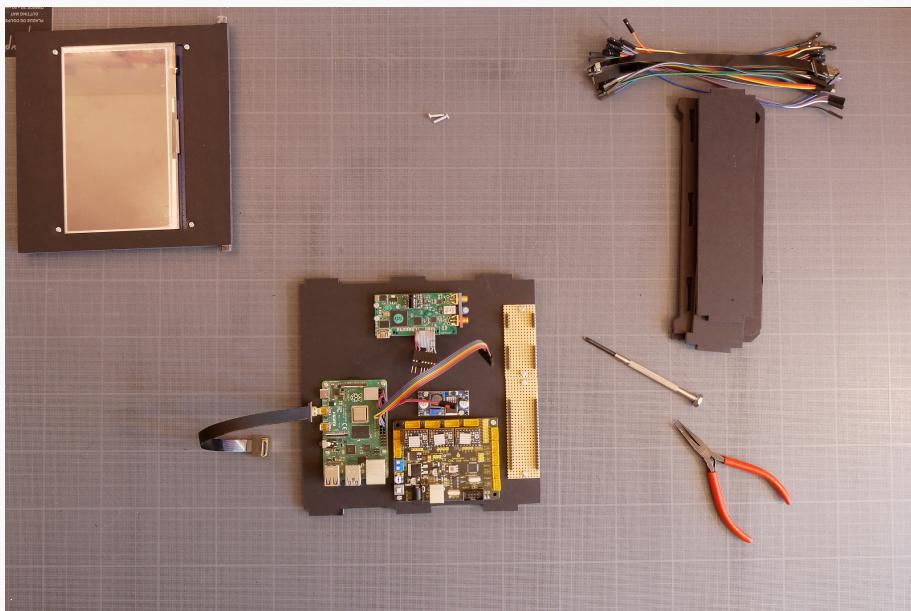


Assembly instructions

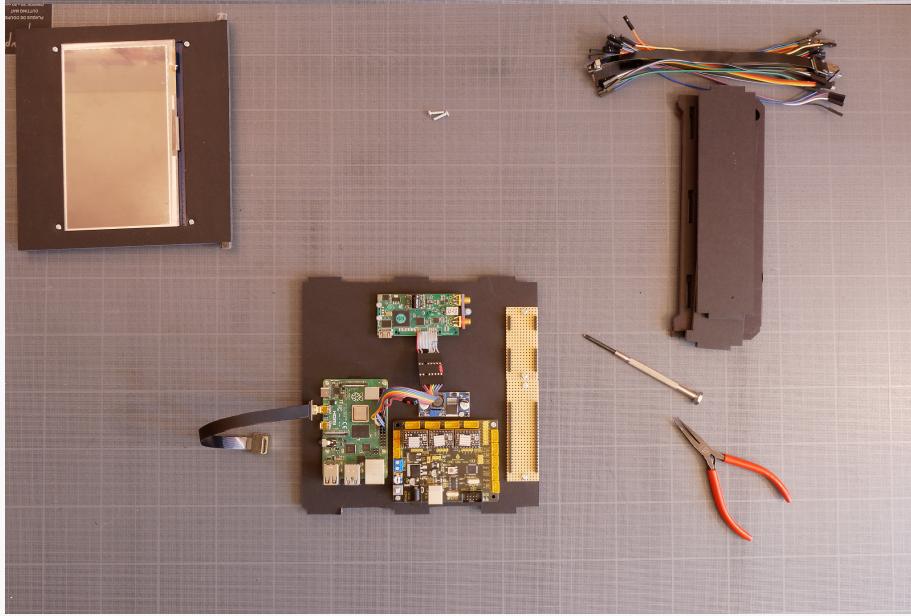
Connect the HDMI wire to the Raspberry Pi

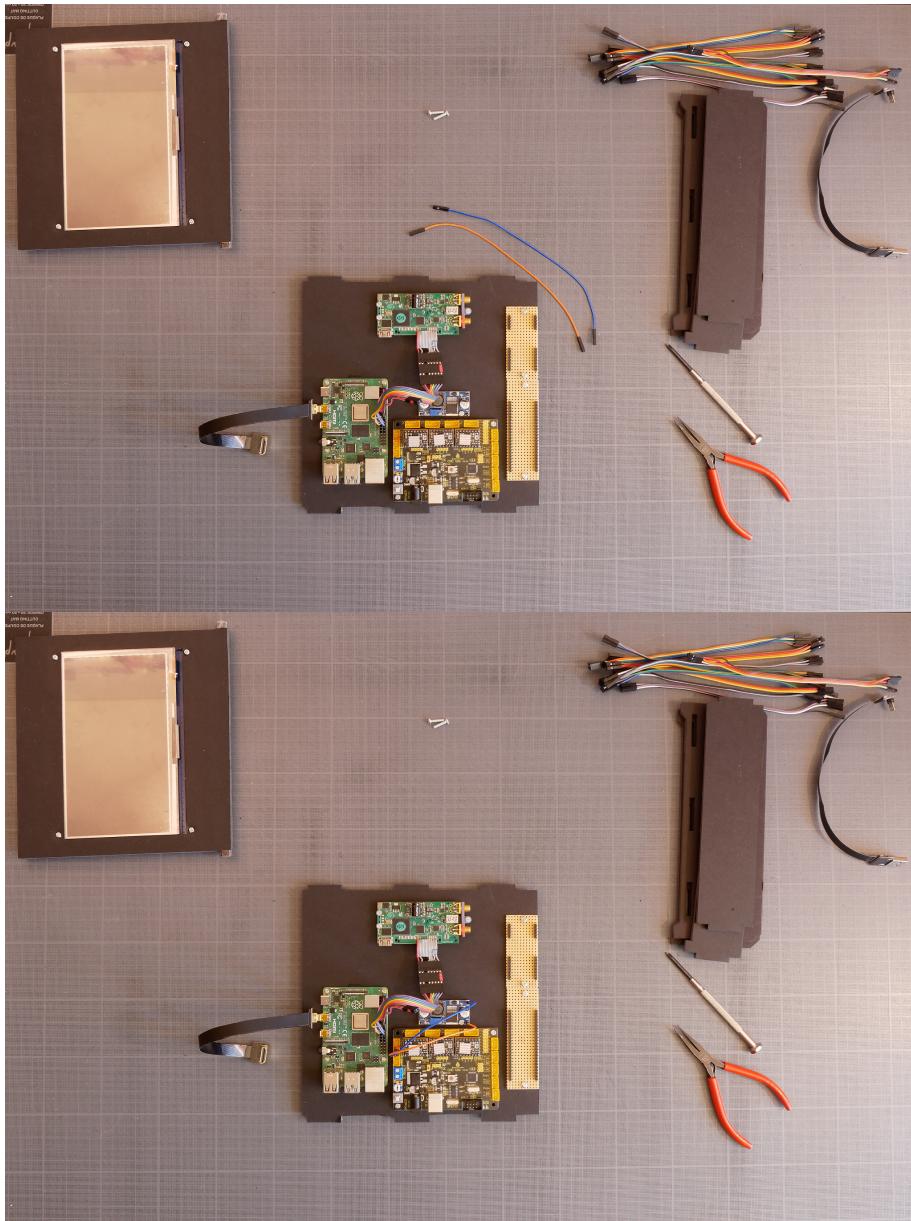


We are now going to connect all the components following this wiring scheme

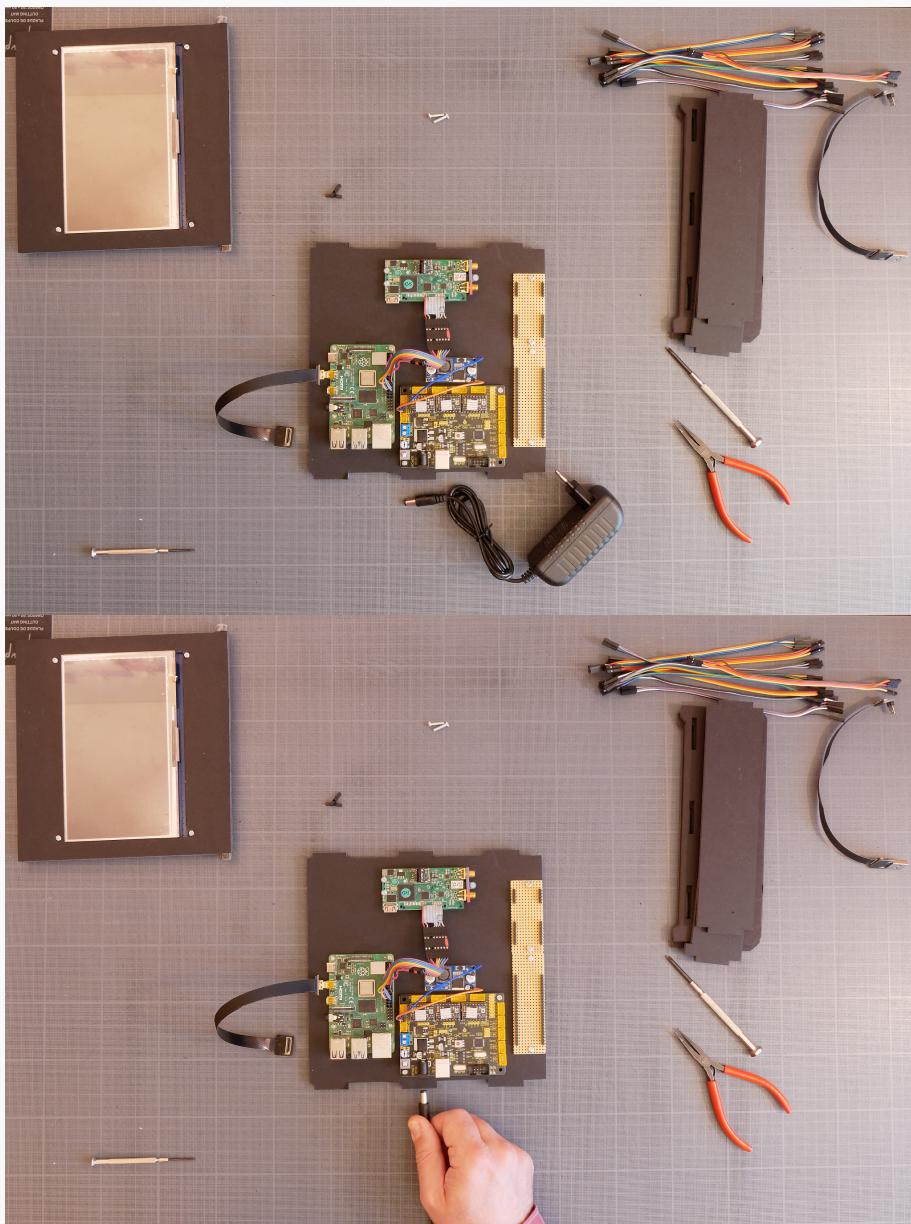
Picture**Assembly
instructions**

Connect the RPi to the ultrasound board



Picture**Assembly
instructions**

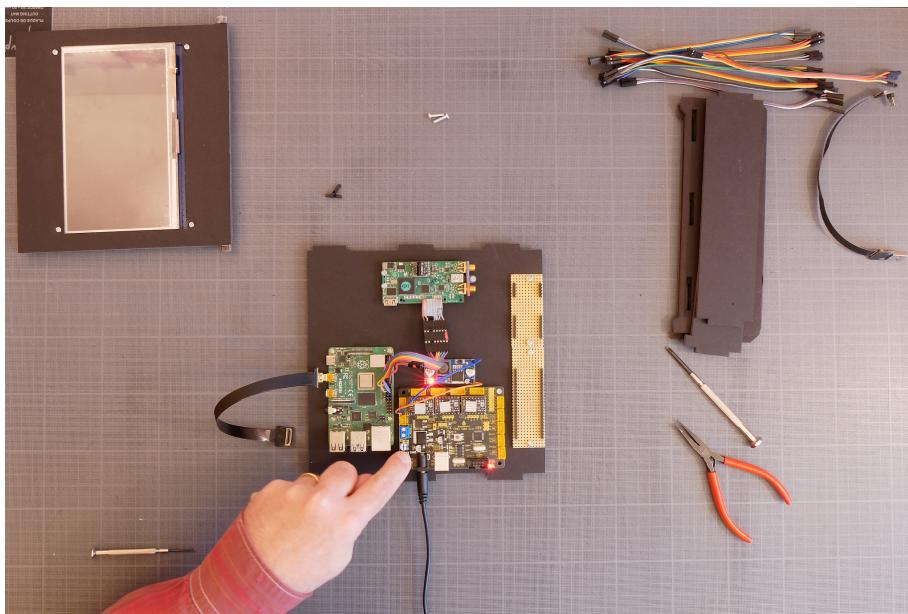
Then
connect the
CNC card to
the 5V Step
down power
supply

Picture**Assembly
instructions**

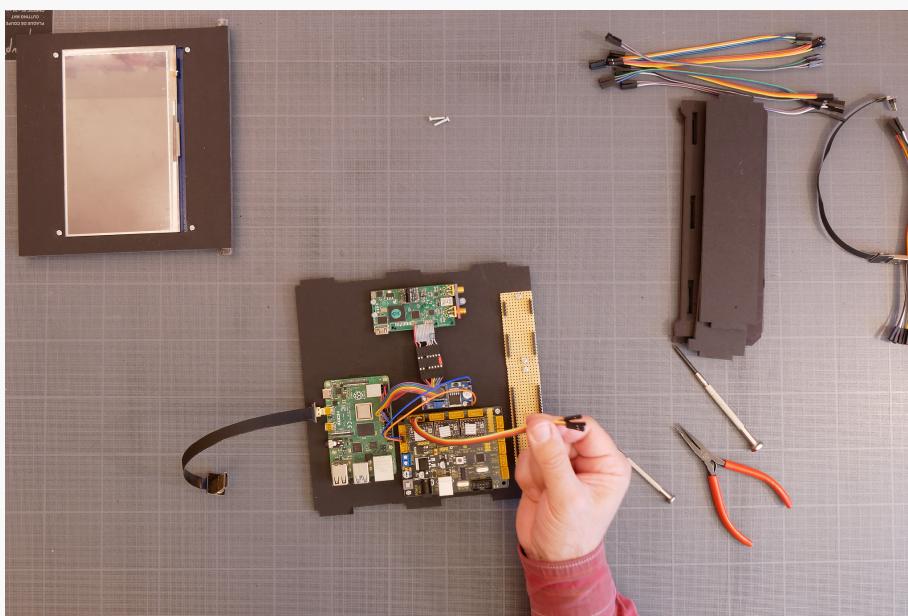
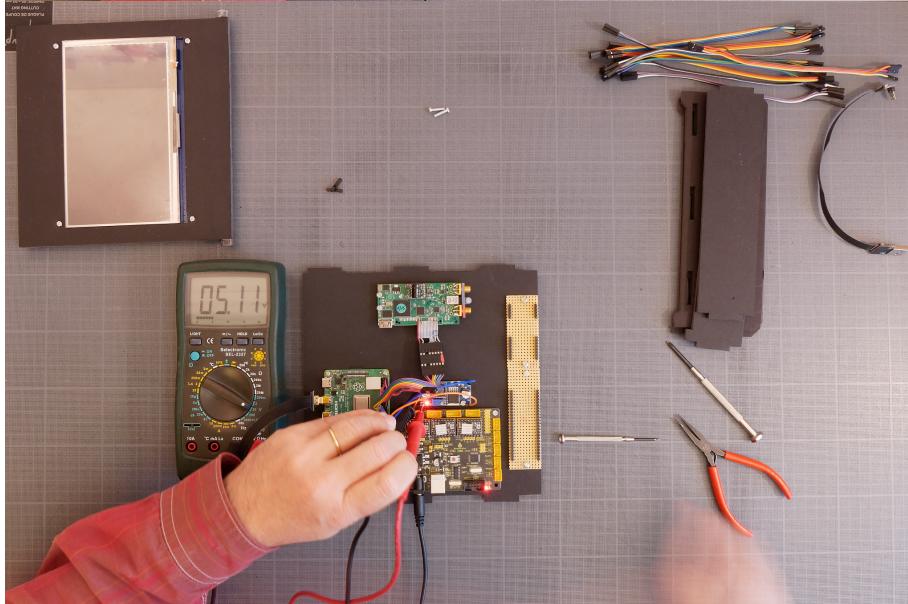
Connect the
12V Power
supply to the
CNC card

Picture

Assembly instructions

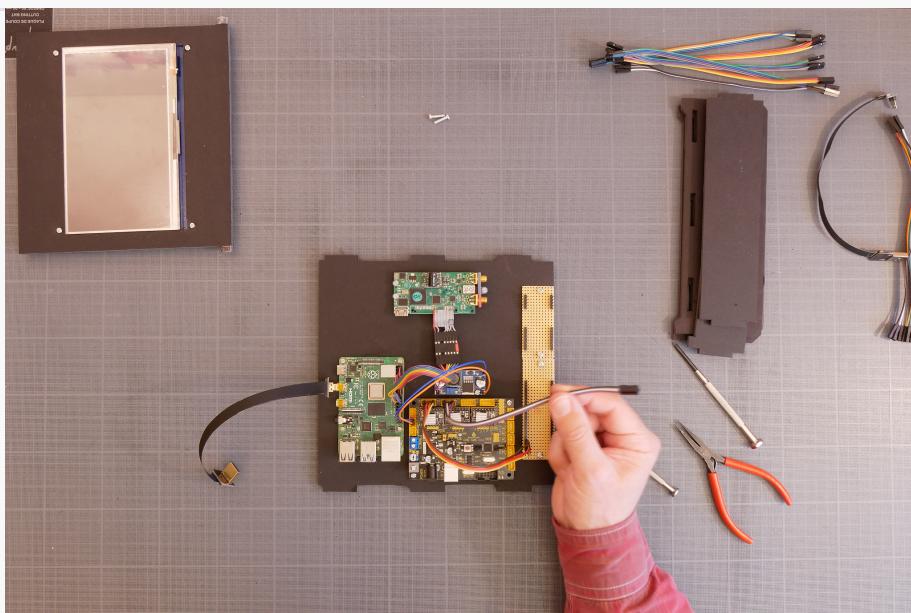


Set the Step down power supply to 5V prior to connect the RPi

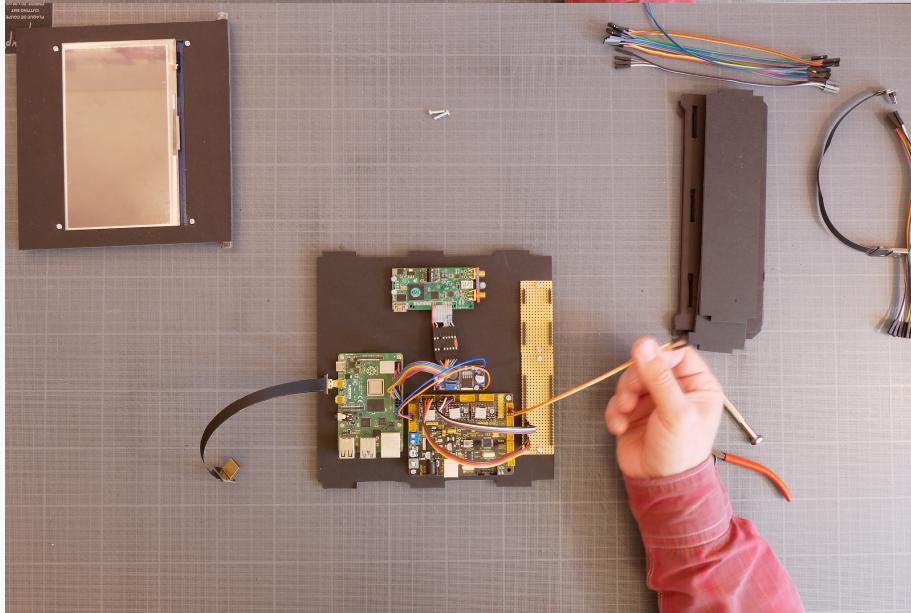


Connect stepper wires from CNC card to connector board

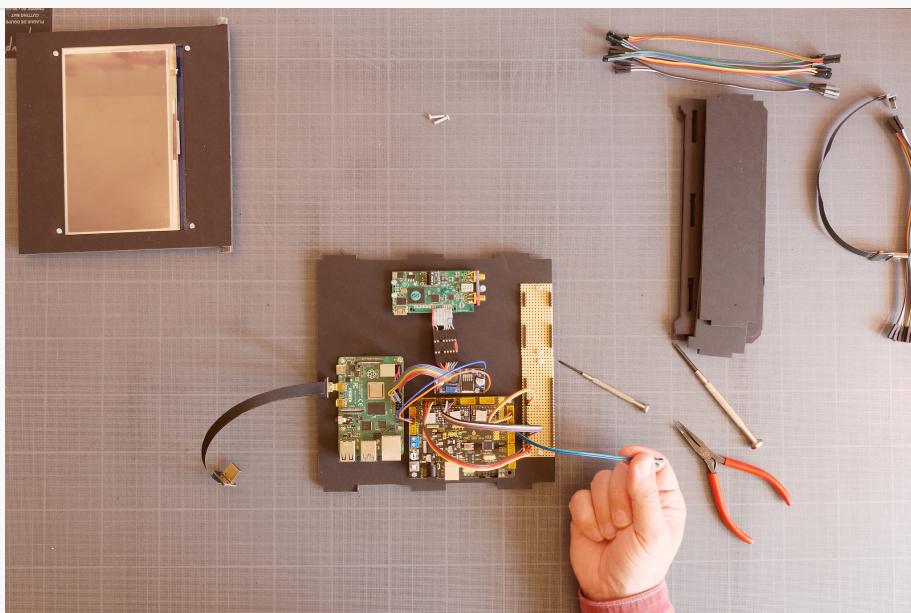
Picture



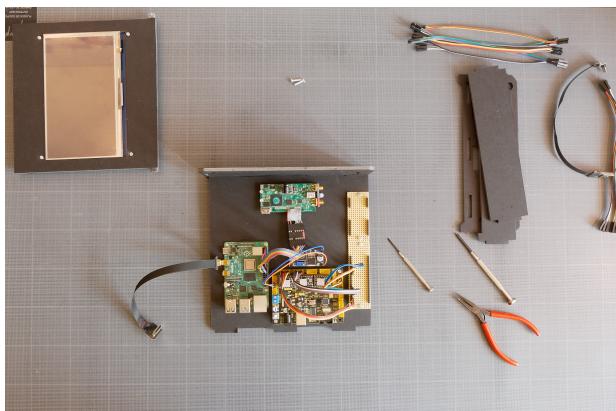
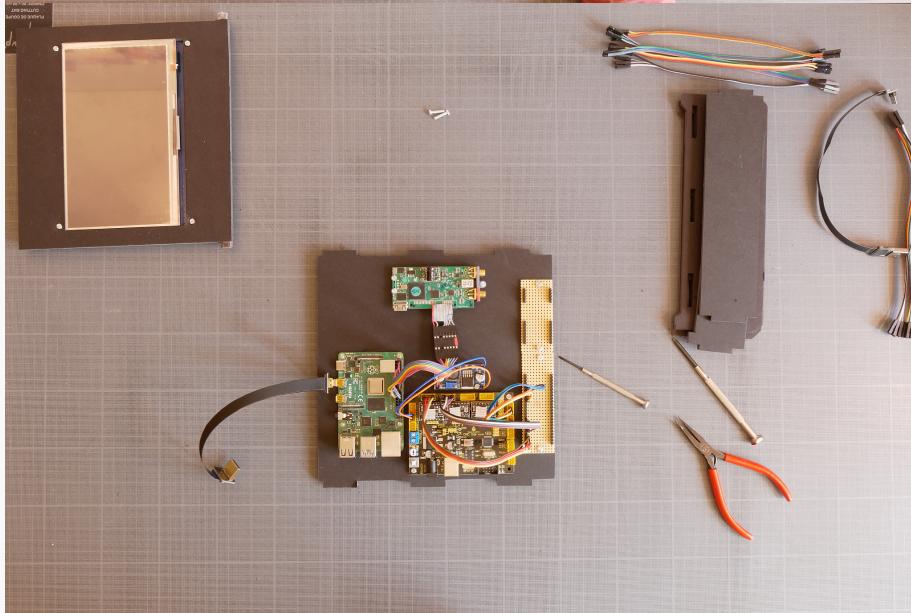
Assembly instructions



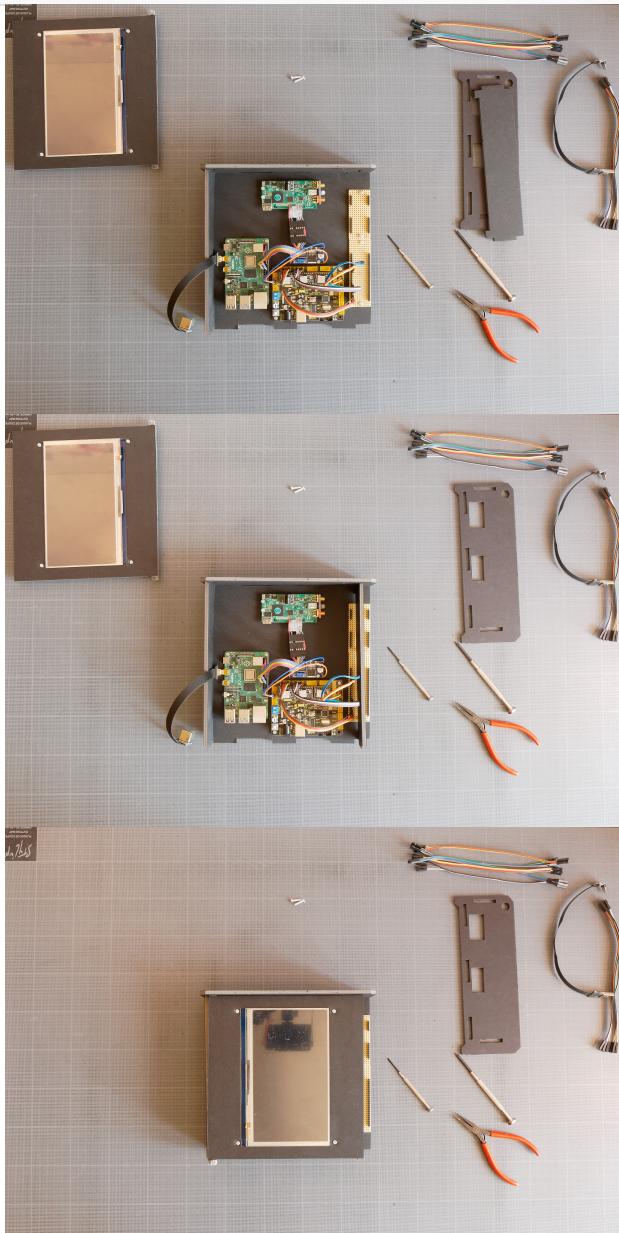
Picture

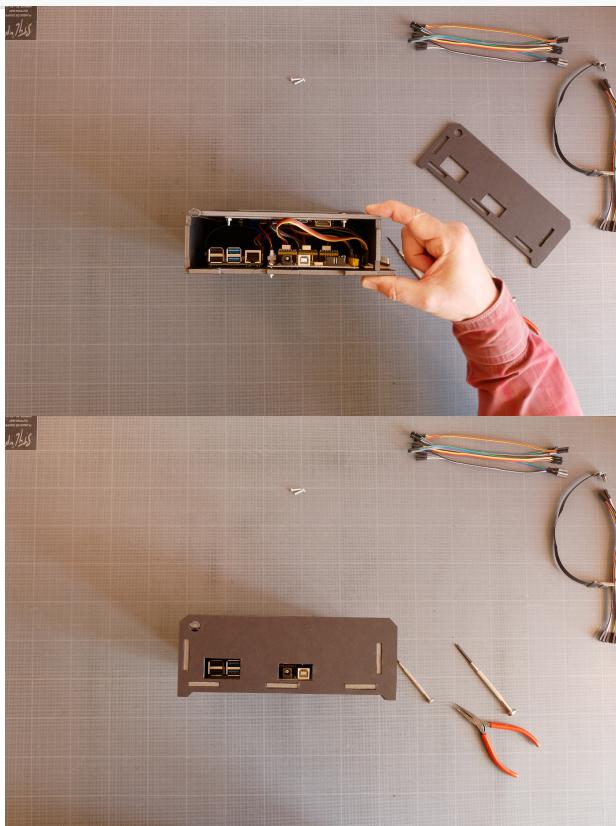


Assembly instructions

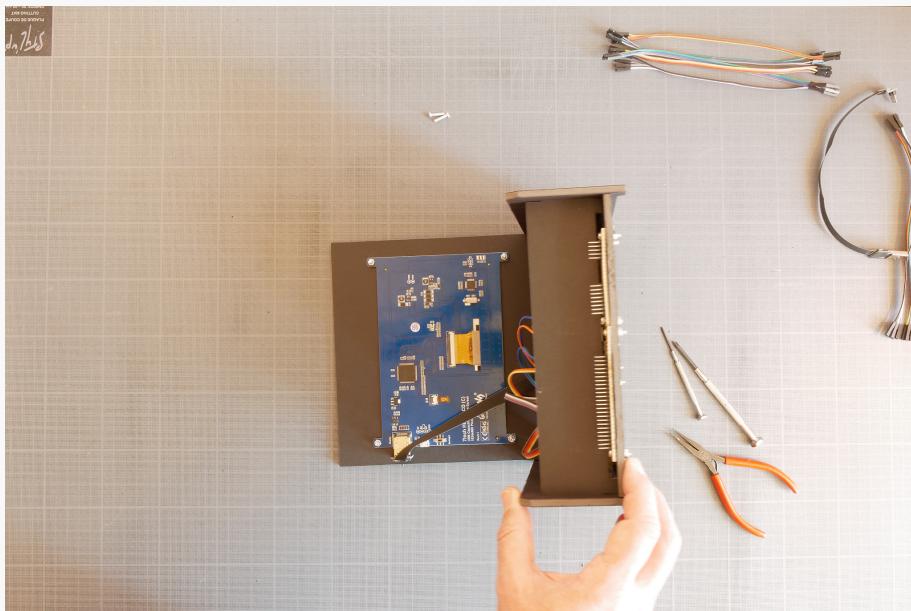


Mount the casing parts and the touch screen

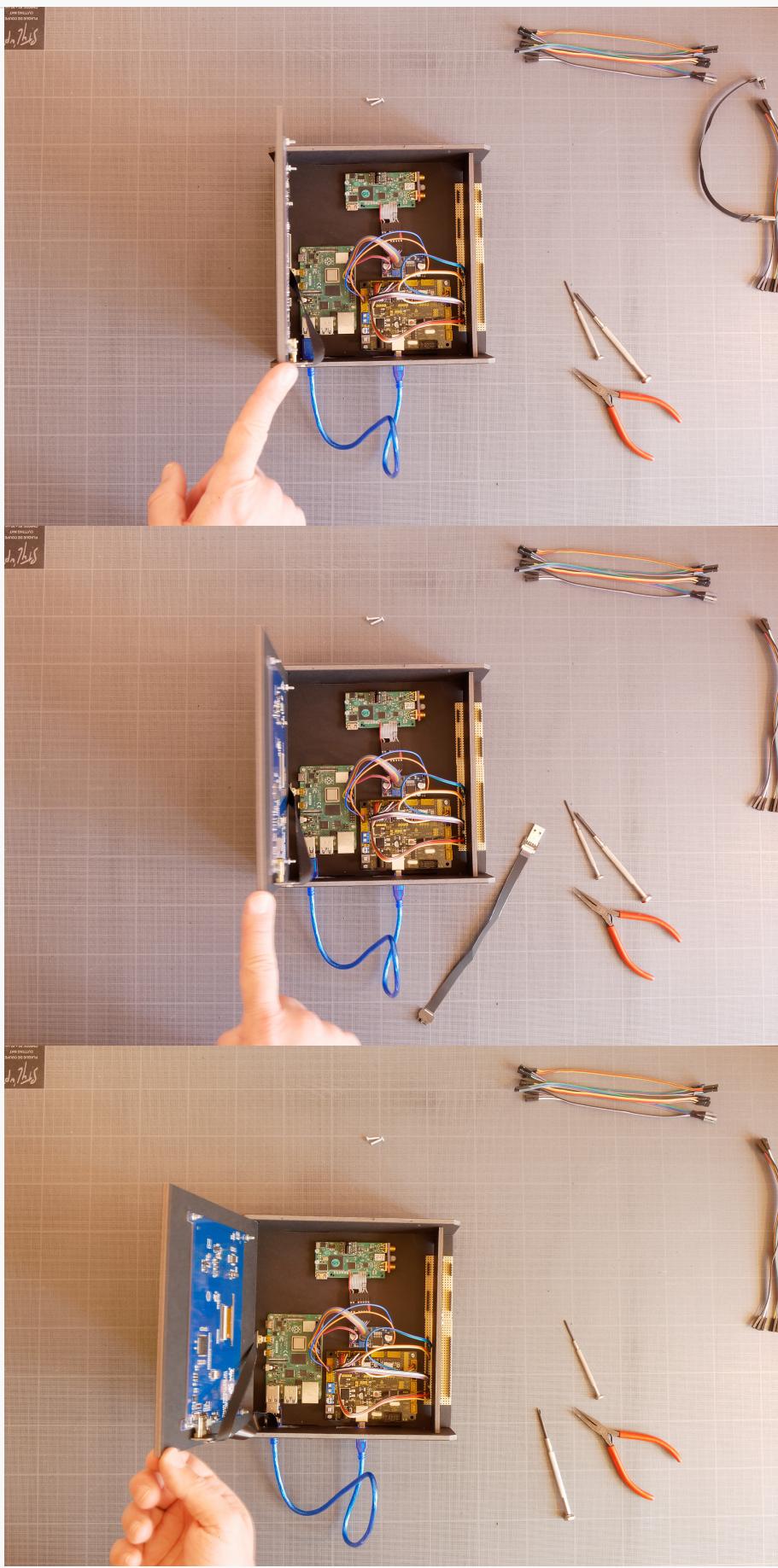
Picture**Assembly
instructions**

Picture**Assembly
instructions**

Connect the screen and the RPi

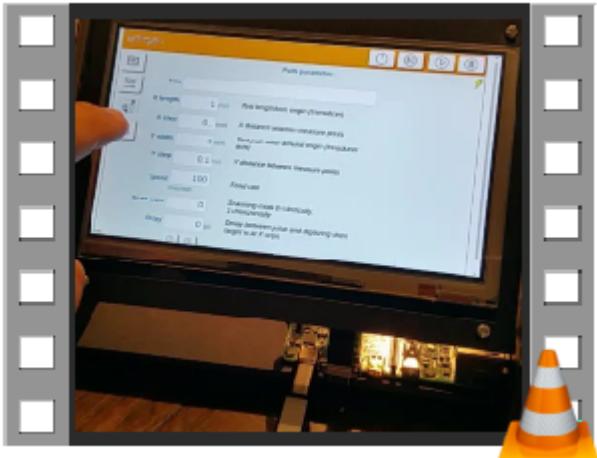


Picture



Assembly instructions

Use



This video is showing a previous version of ELK-box

Starting guide and operating instructions in progress ...