

# **Car Computer / AKA Complicated Clock**

# New Car

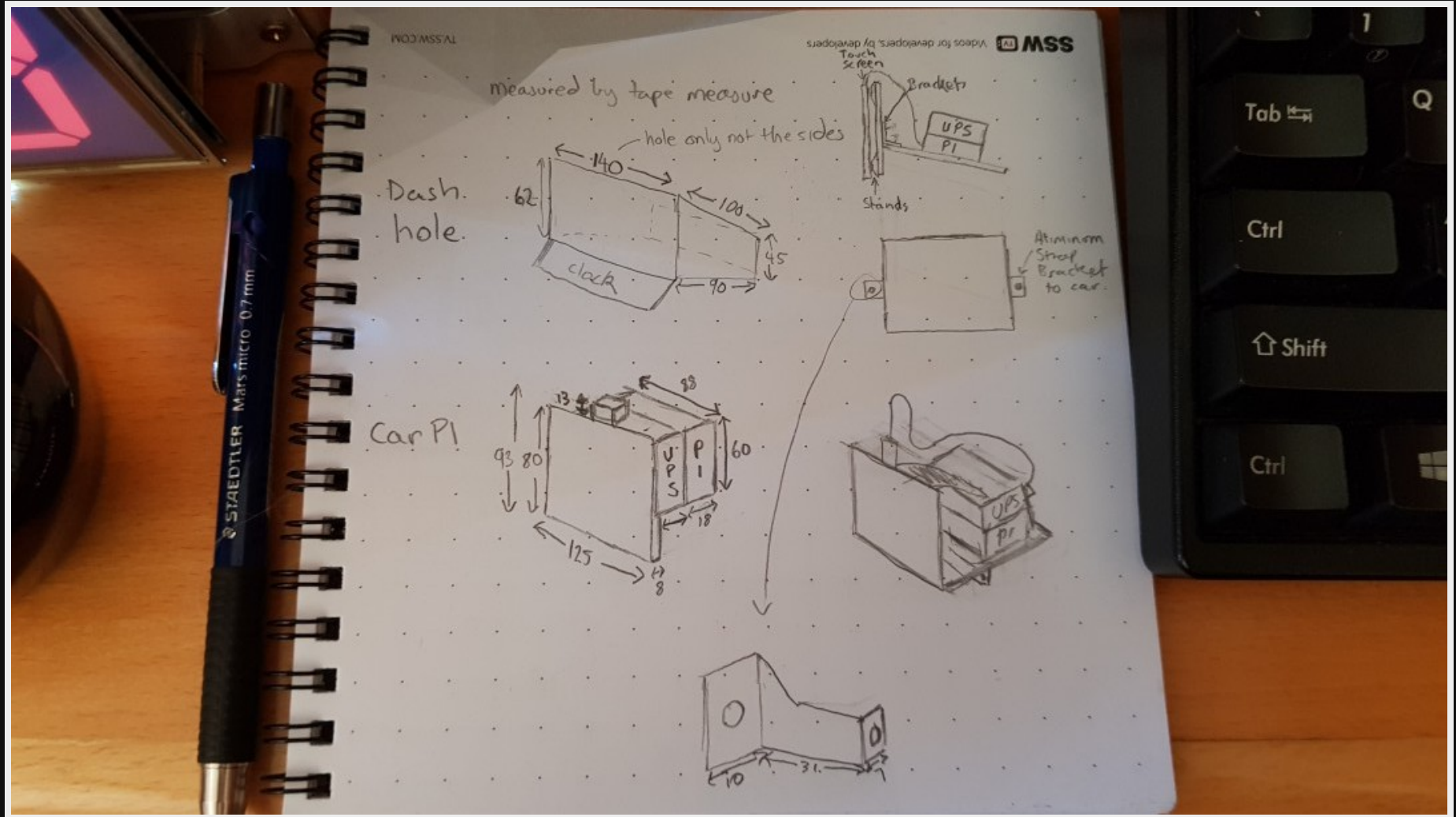


# Problem: Broken Clock



# Idea

Create a car computer to act as a clock!



# Other features

Other features of my Complicated Clock could be

- Dash Cam
- Reverse Cam
- Bluetooth Audio streaming
- ODB2 diagnostics and readout
- Temperature readings inside/out

# Challenges

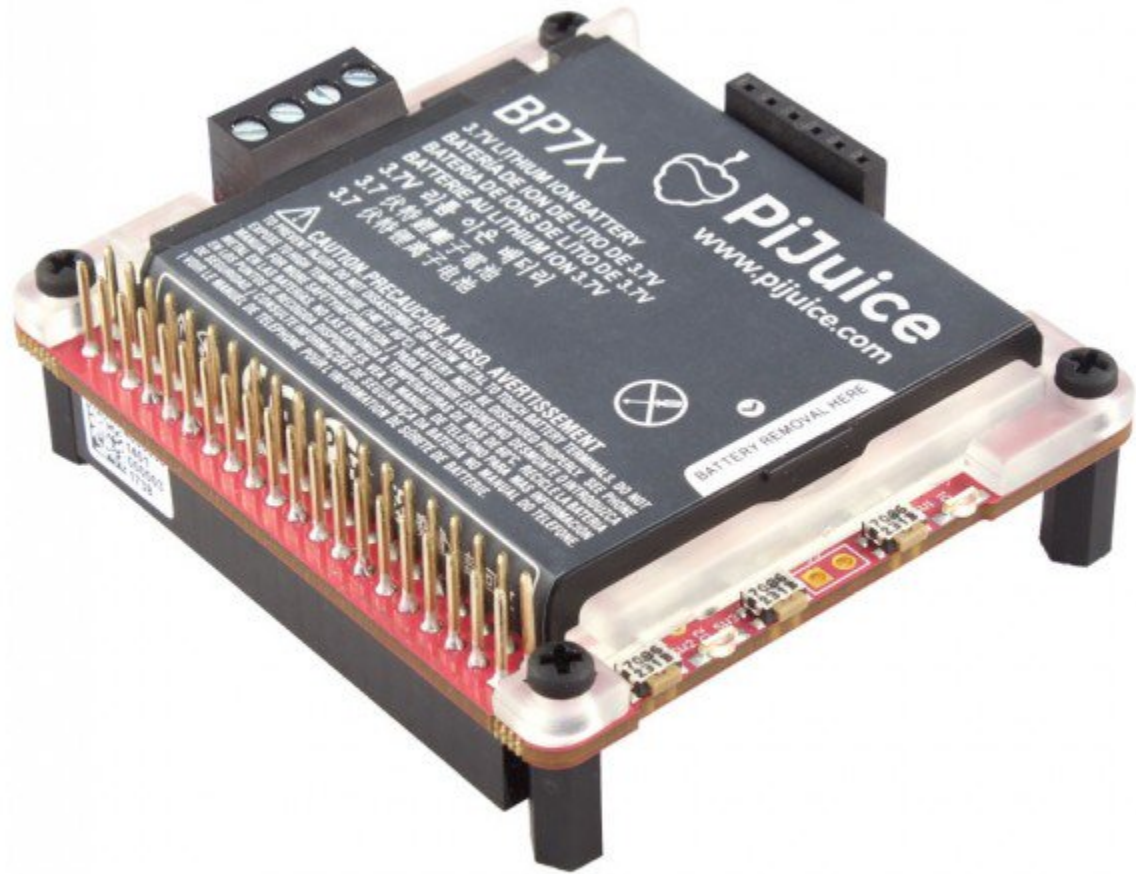
- Power
- Mounting screen & computer

# Hardware

Computer	Raspberry PI 3B+
UPS	PiJuice
Screen	5in PI Screen

# PiJuice





BP7X

3.7V LITHIUM ION BATTERY  
BATERIA DE ION DE LITIO DE 3.7V  
BATTERIE AU LITHIUM ION 3.7V  
3.7V 鋰離子電池  
www.pijuice.com

**CAUTION PRECAUCIÓN AVISO AVERTISSEMENT**  
Do not touch the battery terminals. See manual for more information.  
Ne touchez pas les bornes de la batterie. Voir le manuel pour plus d'informations.  
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BATTERY REMOVAL HELP

# Includes

- RTC
- Battery for up to 5hrs running time (LiPo 1820mAh)
- Shutdown scripts
- 3 x Programmable buttons
- Stackable GPIO

<https://core-electronics.com.au/pijuice-hat.html>

# Power adapter

5Volt 3Amp Adapter (not included)



<https://www.altronics.com.au/p/m8630-powertran-qc3-4.8a-5v-dc-car-dual-usb-adaptor/>

# 5" Screen



# Z6513

- 5 inch screen
- \$80 on special
- 800x480
- Touch support
- HDMI input

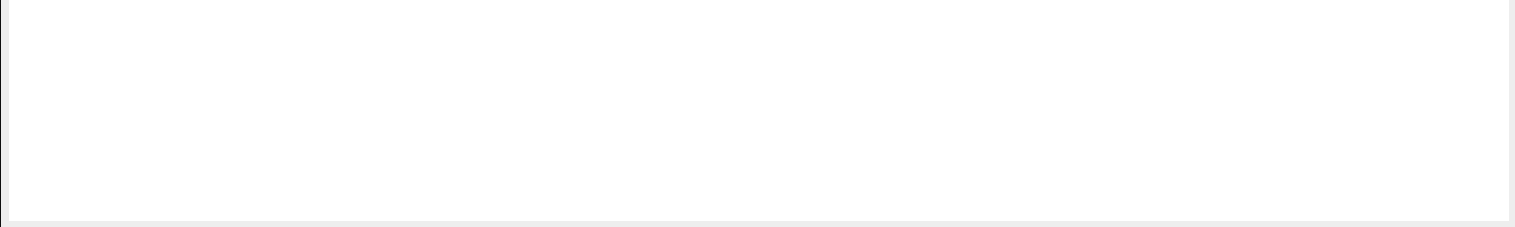
<https://www.altronics.com.au/p/z6513-5-inches-800x480-lcd-touchscreen-for-raspberry-pi/>

# Issues

- Foggy looking in direct sun due to overlay & brightness
- No hardware brightness control
- HDMI cable is in the way

# Raspberry Pi 7inch







# 7inch features

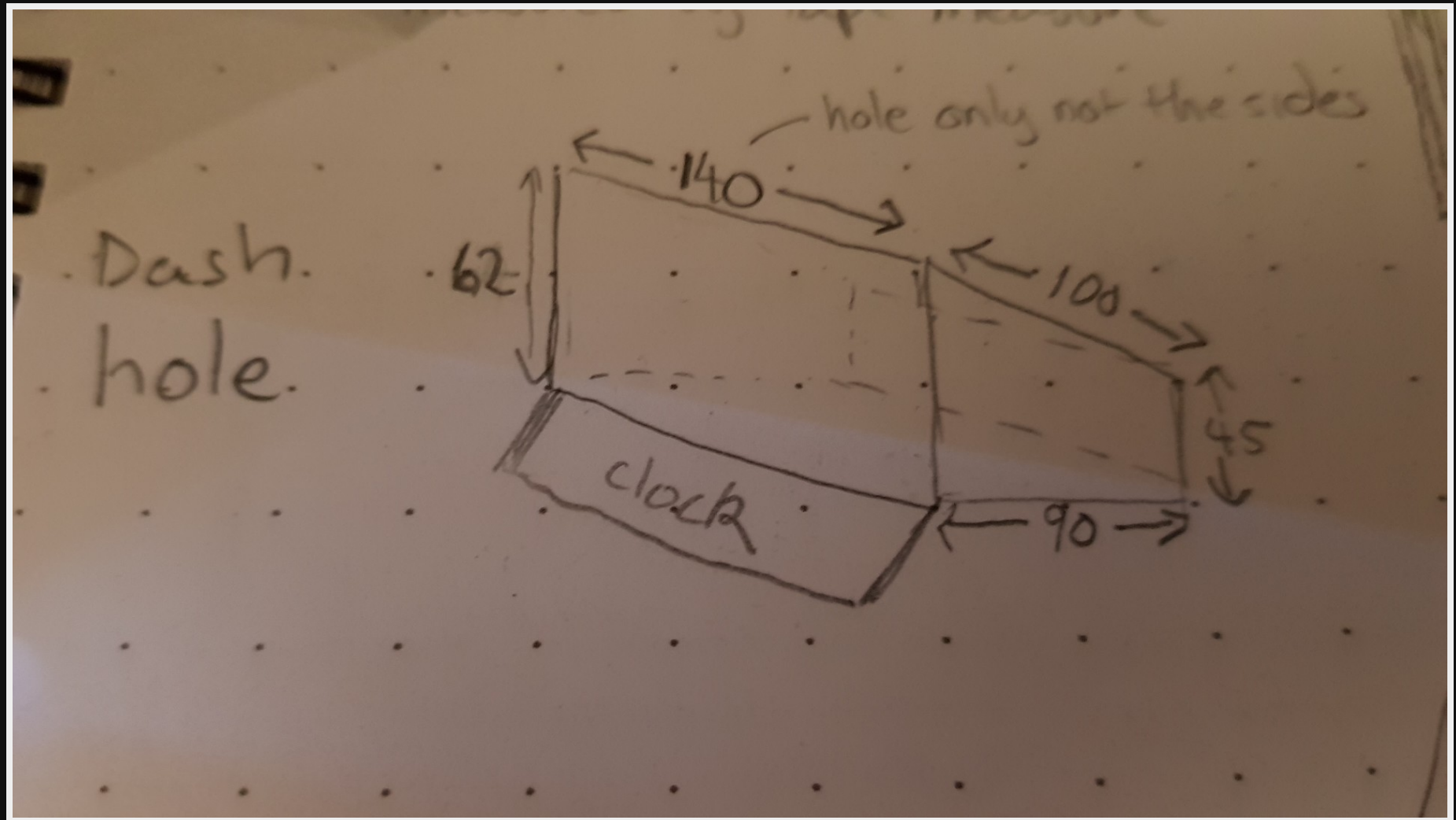
- Ribbon cable input
- Better touchscreen (Capacitive touch)
- Wider viewing angle 70 degrees
- Larger

**Measure & Plan**

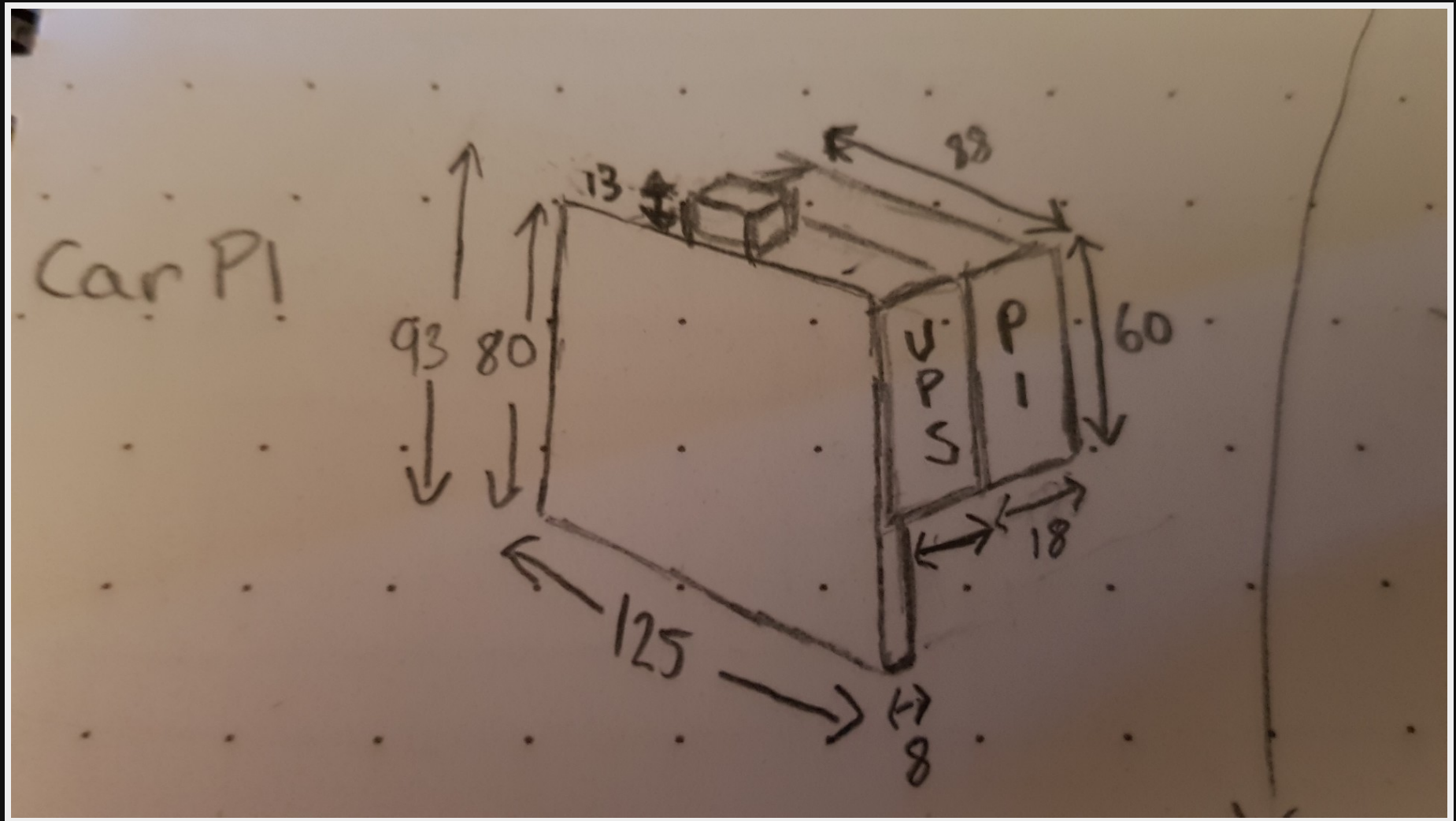
# Dash hole



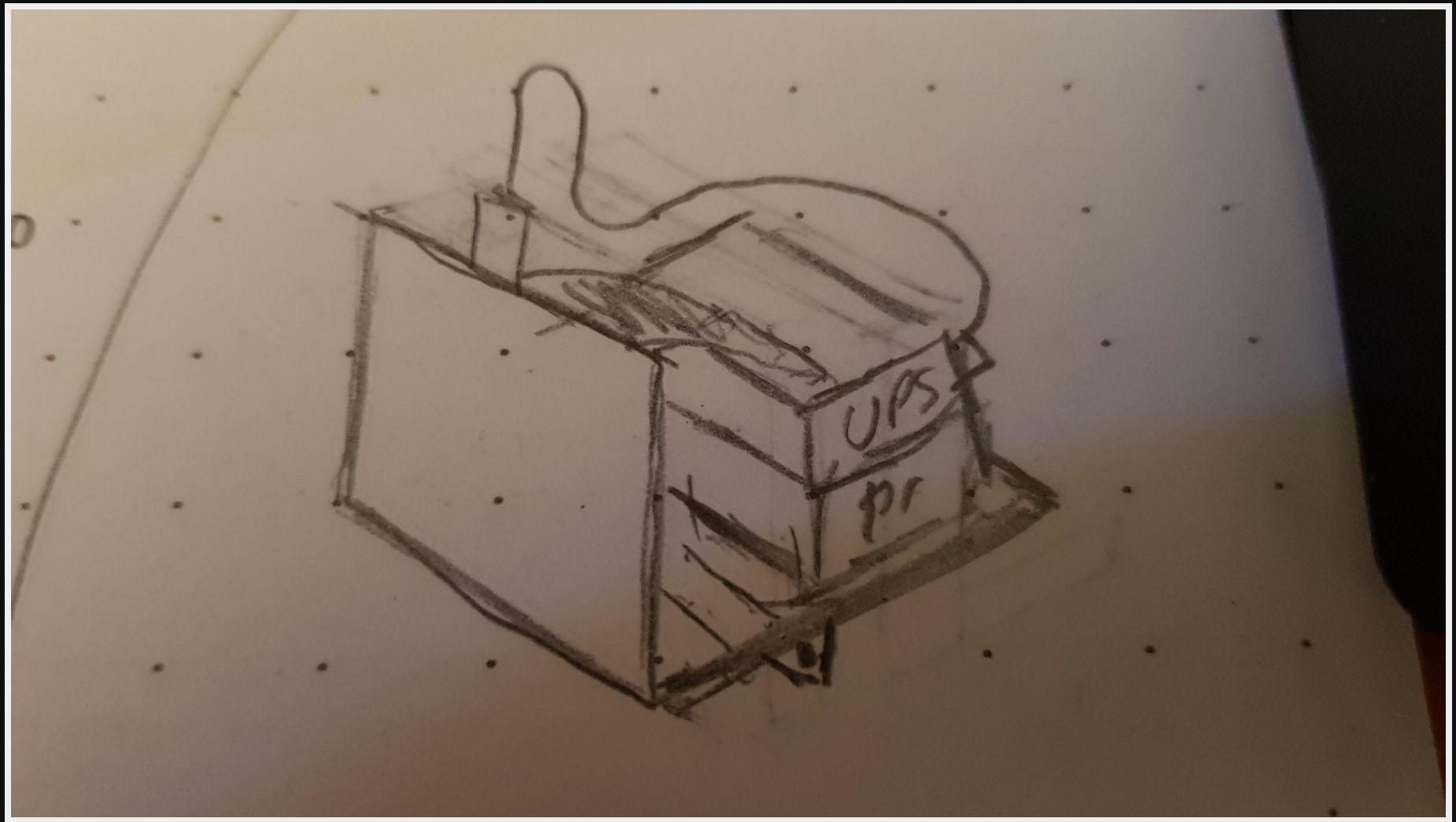
# Measure: Dash hole



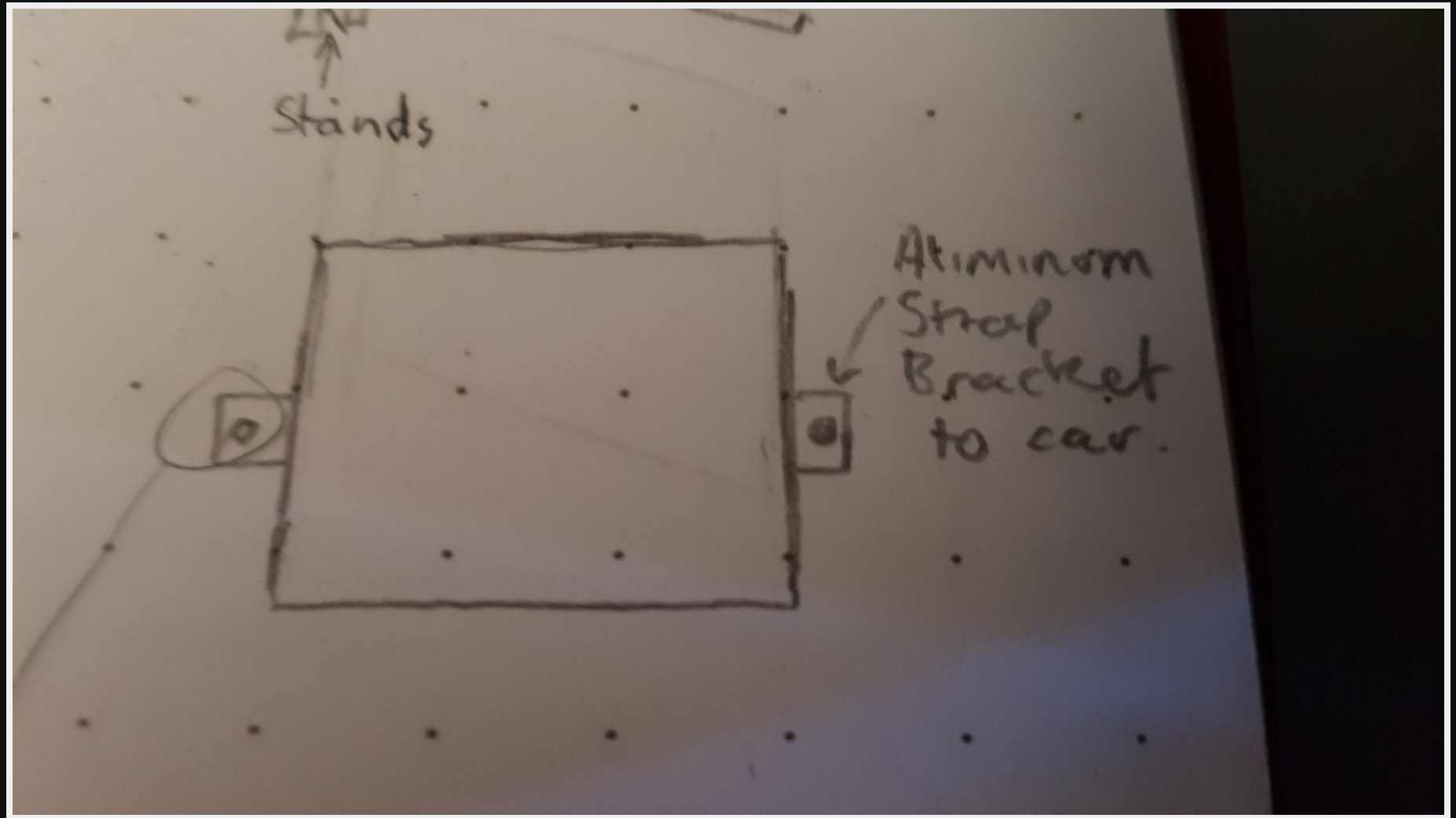
# First thoughts



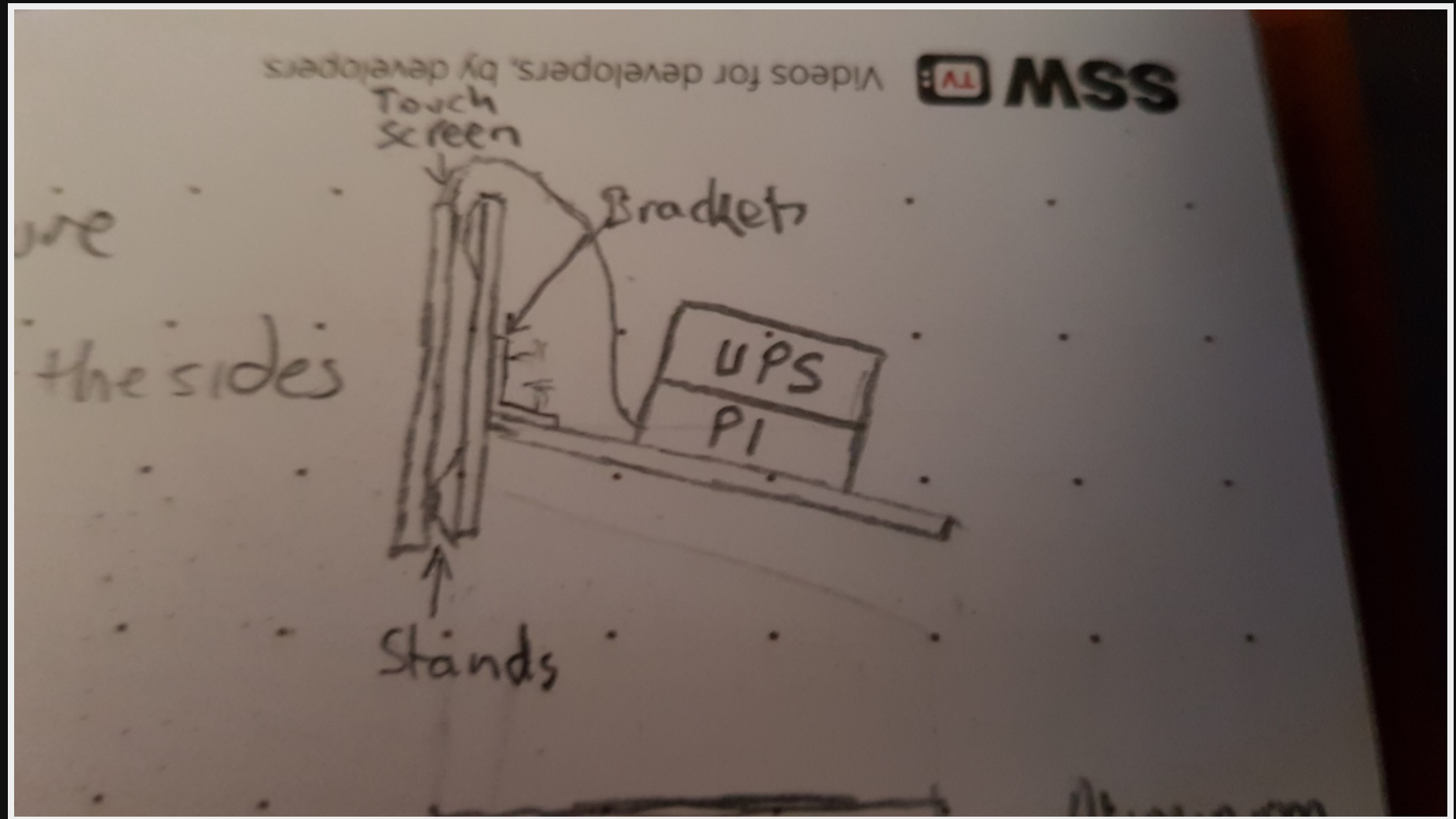
# Final plan



# Front view



# Side view





# Mocking Prep

- cardboard
- strap brace (0.5mm galv)
- double sided tape

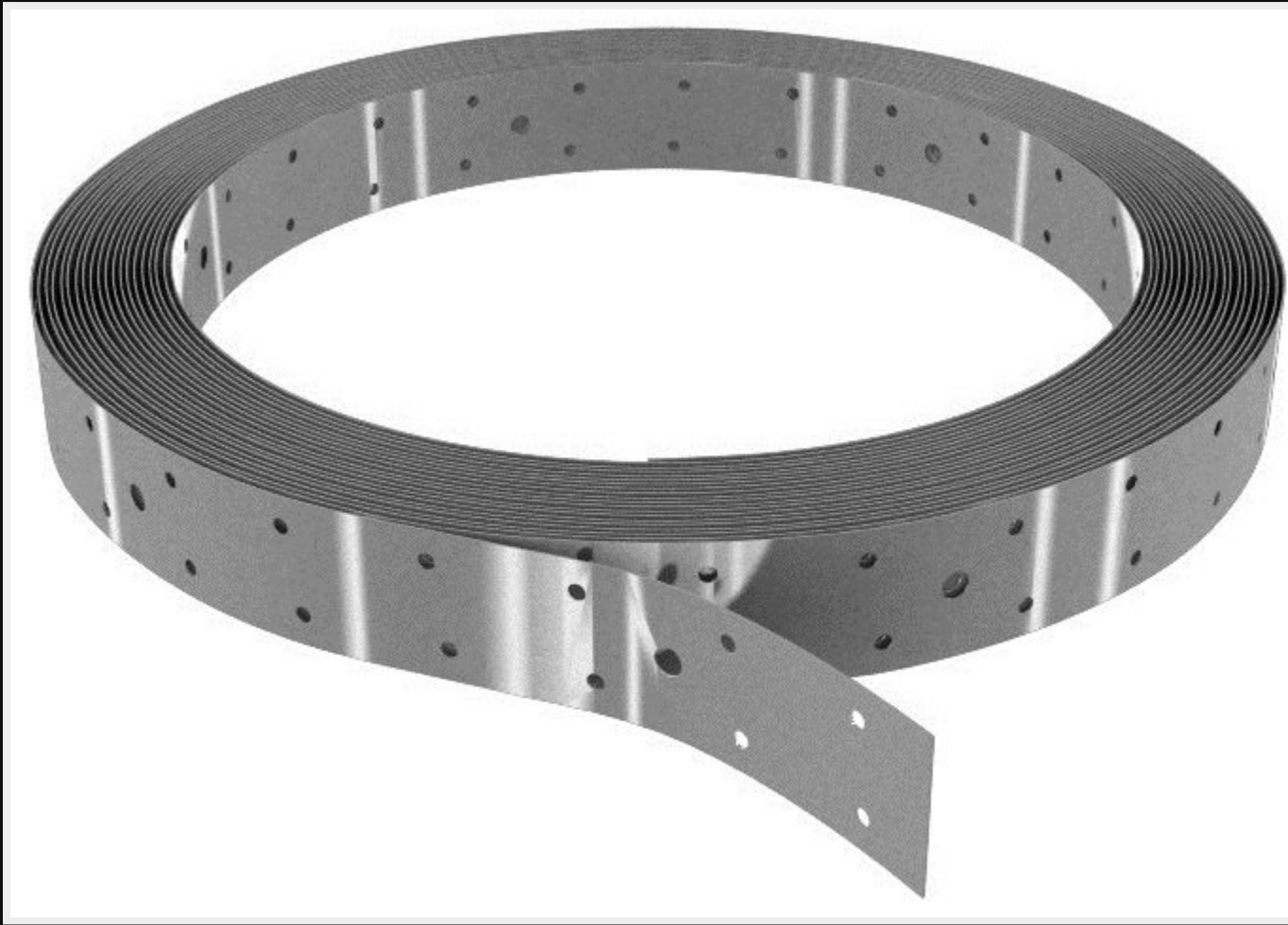
# Structure

Using cardboard I could quickly create the structure using a pair of scissors and double sided tape on brackets.

# End result look



# Bracket making



# Process

Using strap brace I could easily:

- bend (using a vice and hands)
- cut (with tin snips)
- mount (small screws in pre-drilled holes)

# Test



# Make longer



# Bend





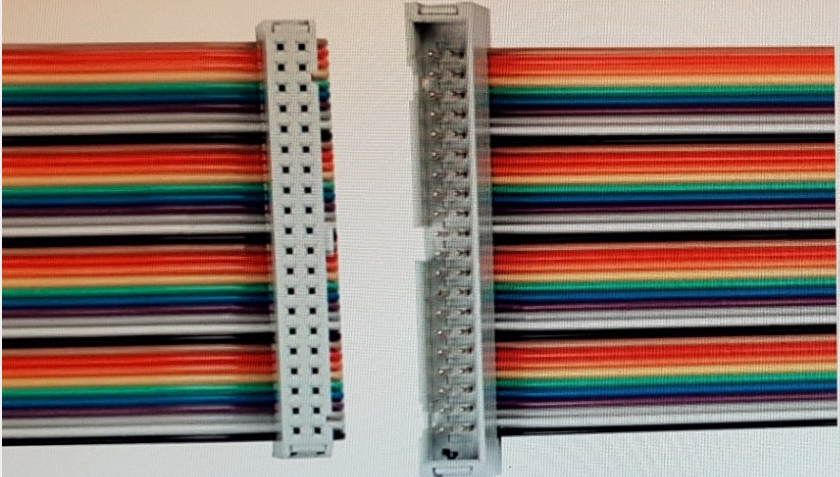
# Cabling

Needed to extend the ribbon cable.

- Ribbon cable (40pin)
- 40 pin female header
- 26 pin male header surface mount
- experimenters board
- lots of coloured cable

# Problem

Couldn't find the correct headers



Miuzei 40pin Male to Female GPIO Ribbon Cable Compatible with Raspberry Pi 3B+ 3 2 Model B B+

by Miuzei  
★★★★★ 8 customer reviews

Price: **\$8.59**

Color: **40pin Male to Female**

- Design for conanct Raspberry Pi Model 3B+/3B/2B/B+/rpi 1 B Model B+ with 3.5 and 5 Inch LCD Panel.
- Male to female IDC 40 pin ribbon cable flat GPIO Cable.
- Length:about 8 inch/ 20cm,standard 0.1"(2.54mm)
- Raspberry Pi 3B+ 3 2 Model B B+ and 3.5" 5 Inch TFT touchscreen LCD display are not including.
- By connecting non-standard or odd-spaced headers of jumper wires to complete other tests such as lightening LEDs.

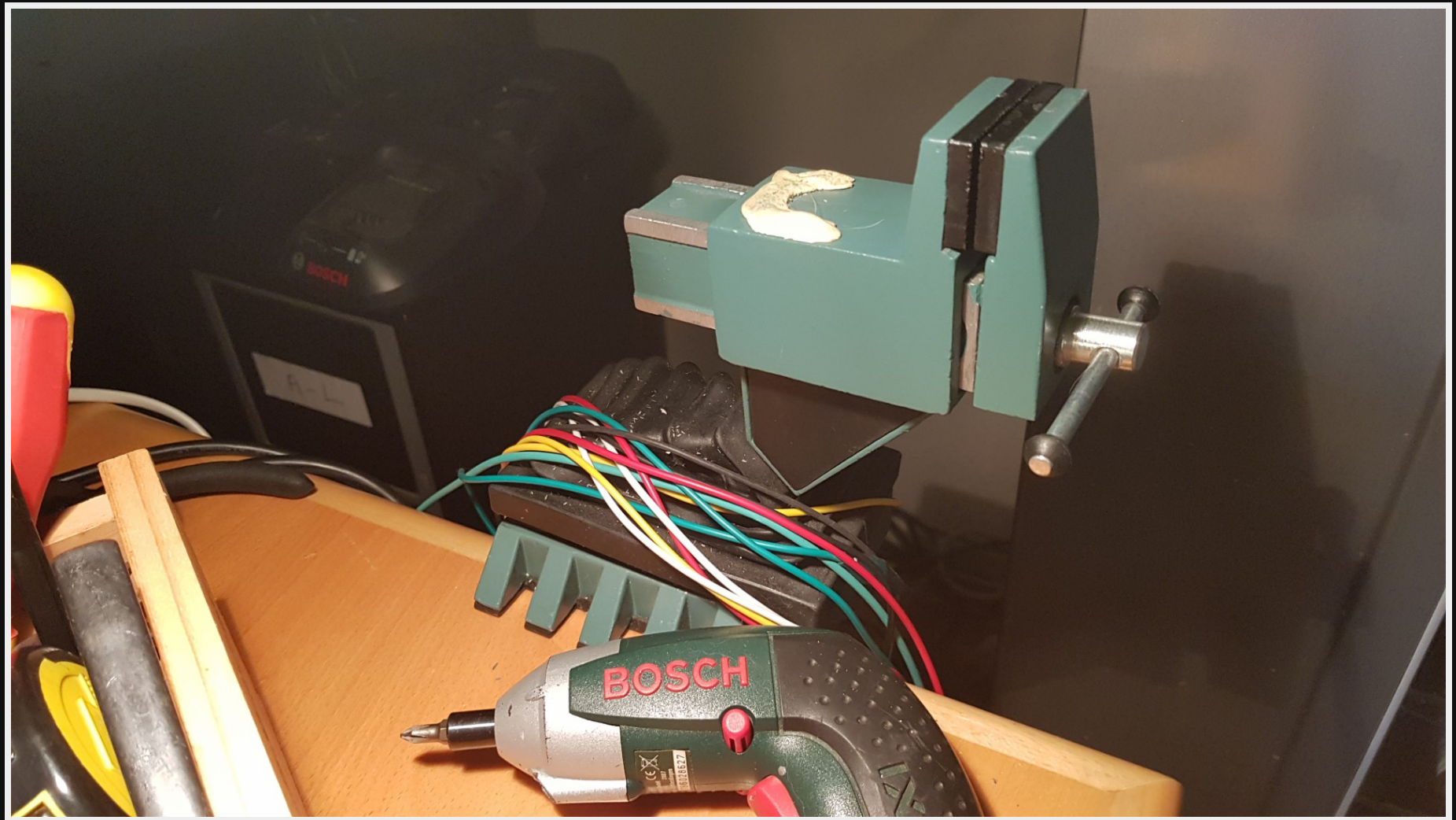
[Compare with similar items](#)

**New (1)** from \$8.59

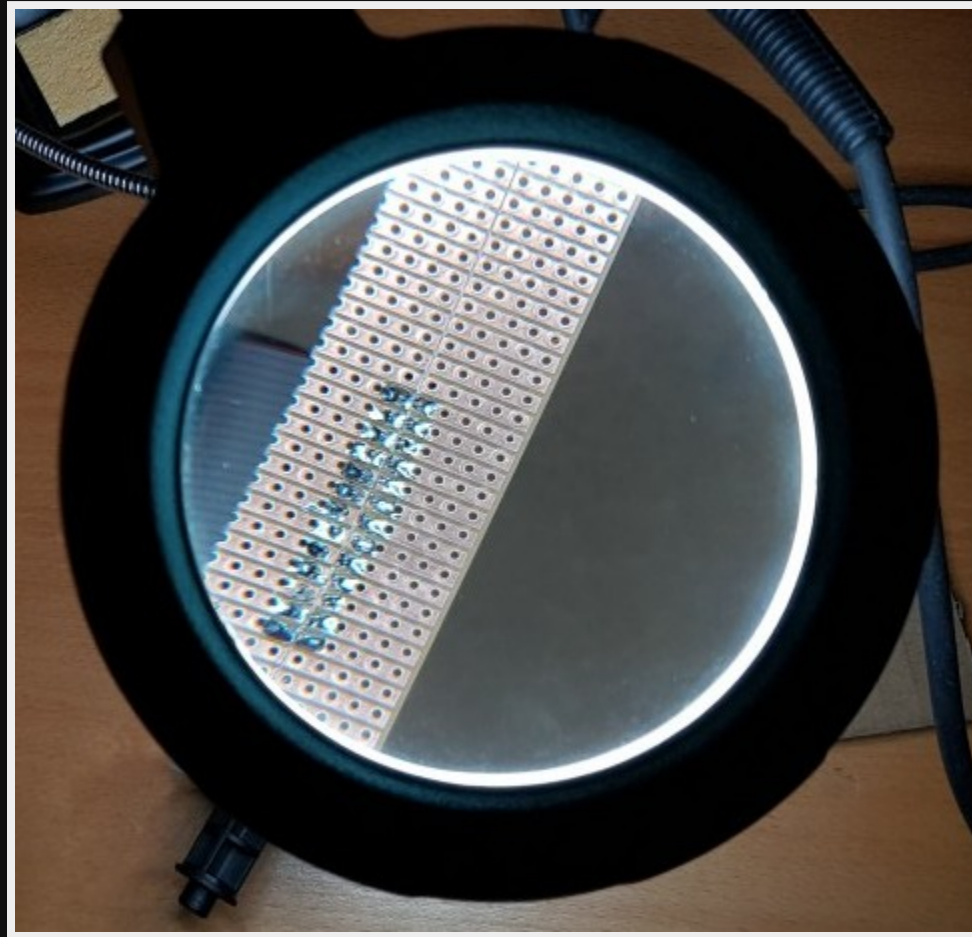
# Prepare



# Press ribbon headers with vice



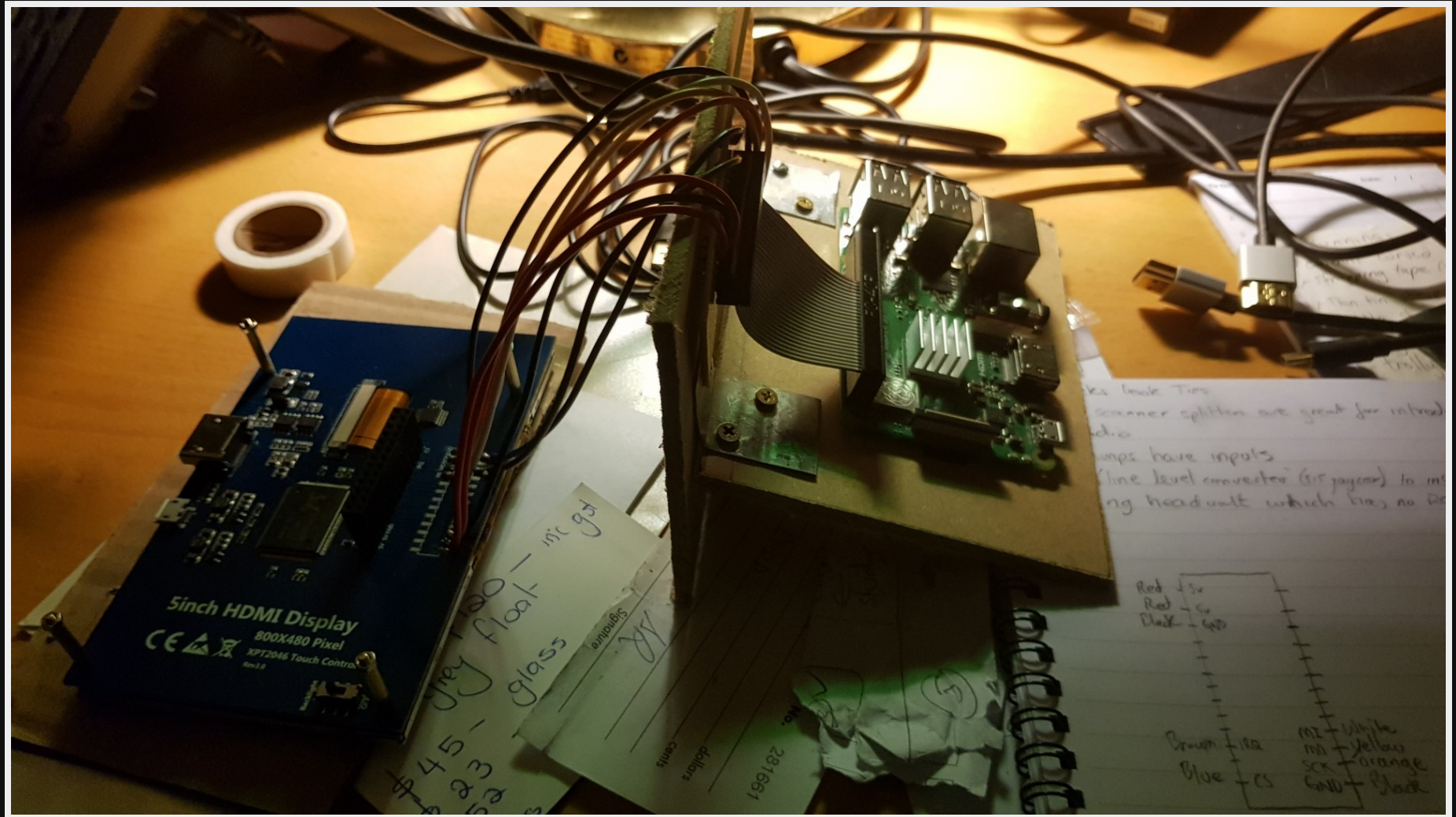
# Solder surface mount



# Solder onto screen



# End of cabling



# Risers

To attach the 5in screen to the front

Parts

- 1mm Aluminium strap (can cut with tin snips)



# Finding a riser

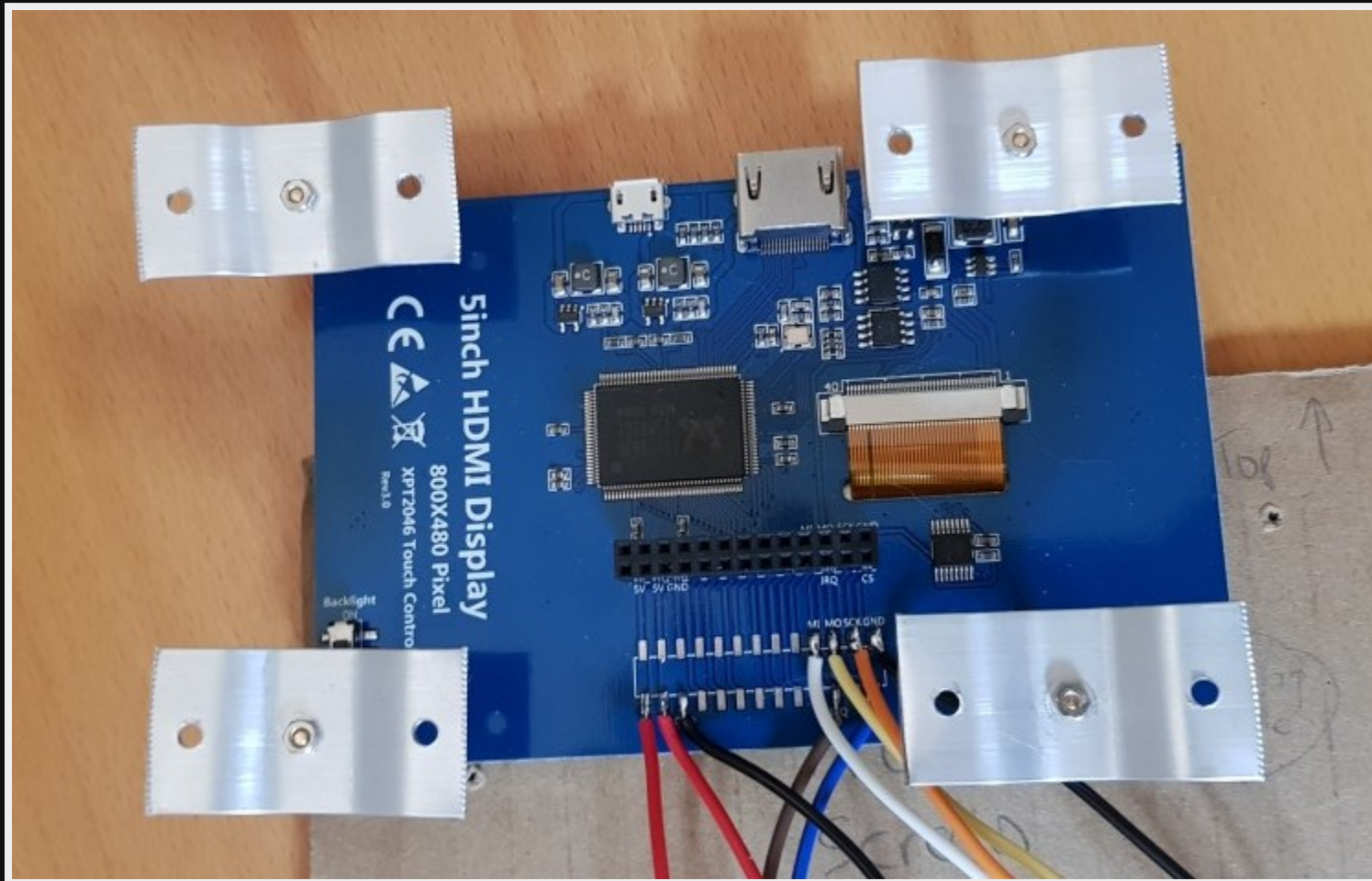
Too big, nothing exists.



# Making my own risers



# Attaching risers to screen



# **Problem!**

Couldn't screw these small risers on.

# **Solution**

Use a longer rail riser design

# Final attachment



# FM Transmitter

- Raspberry PI can act as a FM transmitter with no extra hardware
- Could use to transmit music/phone calls/etc to car stereo



# Installation

- Connect cable 30cm to GPIO4
- Install fmtransmitter

```
git clone https://github.com/markondej/fm_transmitter
cd fm_transmitter
make -j4
```

# Run

Sample wav file is provided

```
sudo ./fm_transmitter -f 98.0 acoustic_guitar_duet.wav
```

# Use MP3

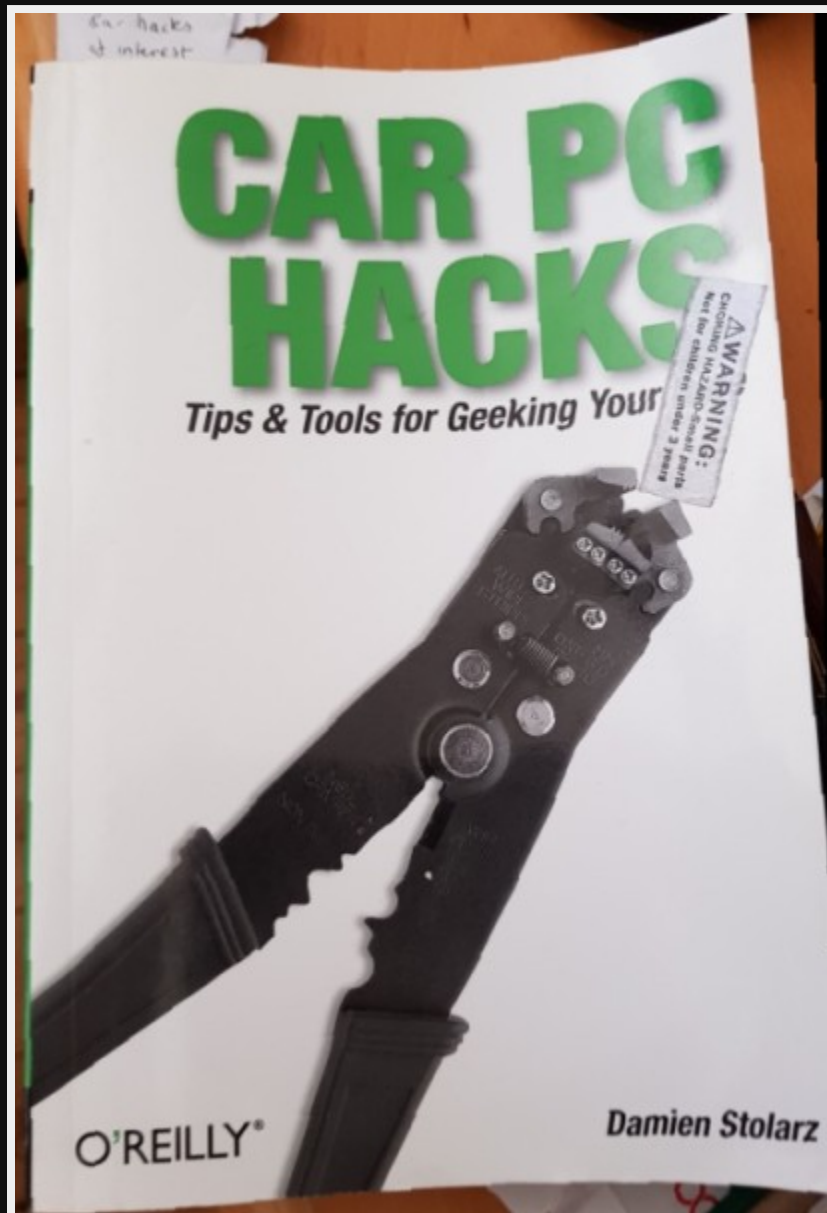
Must convert first

```
sudo apt install sox libsox-fmt-mp3
sox Visigoth\ -\ Final\ Spell\ -\ 01\ Creature\ of\ Desire.mp3 -r 22050 -c 1 -b 16 -t wav create_
sudo ./fm_transmitter -f 98.0 ~/Music/Visigoth/Visigoth\ -\ Final\ Spell/create_of_desire.wav
```

# Future Plans

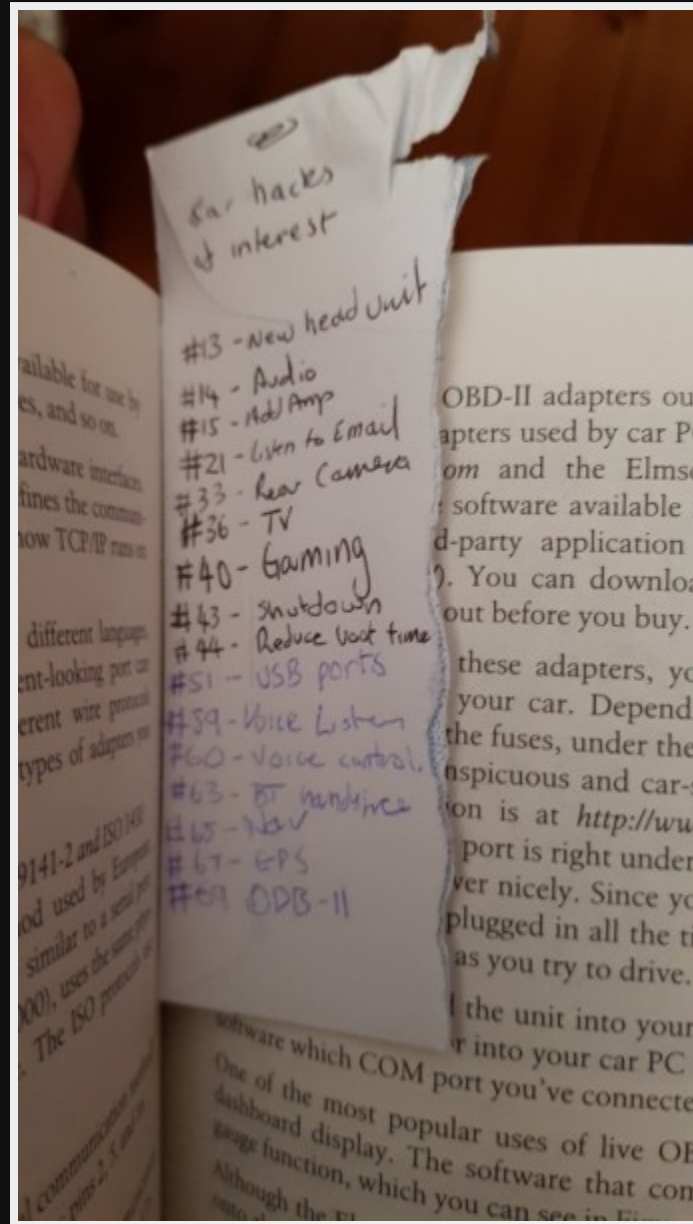
- 5" touch display
- Clock (Using RTC & dclock on 5in display)
- Outside temp readout
- Inside temp readout
- ODB2 readouts (for diags)
- Stream audio (either to a radio station or through a tape deck to audio plug)
- Bluetooth streaming (from mobile through to the cars audio)
- Navigation (Display maps with USB GPS I have somewhere)
- Dash cam
- Reverse cam with a tap of a button
- Add Data sim and tracking ability

# References



- old but still worth it

# Bookmarks



# Questions

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Twitter	<a href="https://twitter.com/map7">@map7</a>
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Github	<a href="https://github.com/map7">github: map7</a>
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