Getting Started with the GPIO to FPC Breakout pHAT for Raspberry Pi

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The Pi Supply GPIO to FPC Breakout pHAT for the Raspberry Pi makes it possible for you to bring out the 40 pin GPIOs of the Raspberry Pi to a display ZIF/FFC connection, which is more commonly used for displays.

This then allows you to connect your own sensors and peripherals etc to the Raspberry Pi whilst having the display connected, which is something that is not currently possible with todays range of Raspberry Pi HAT & pHAT displays. It is also possible to use two of these to extend the GPIO to another location with the option to change the SPI address using the jumpers J1 and J2.

Follow the links below to access the various sections more quickly

- Compatible with various add-on boards
- Whats in the box?
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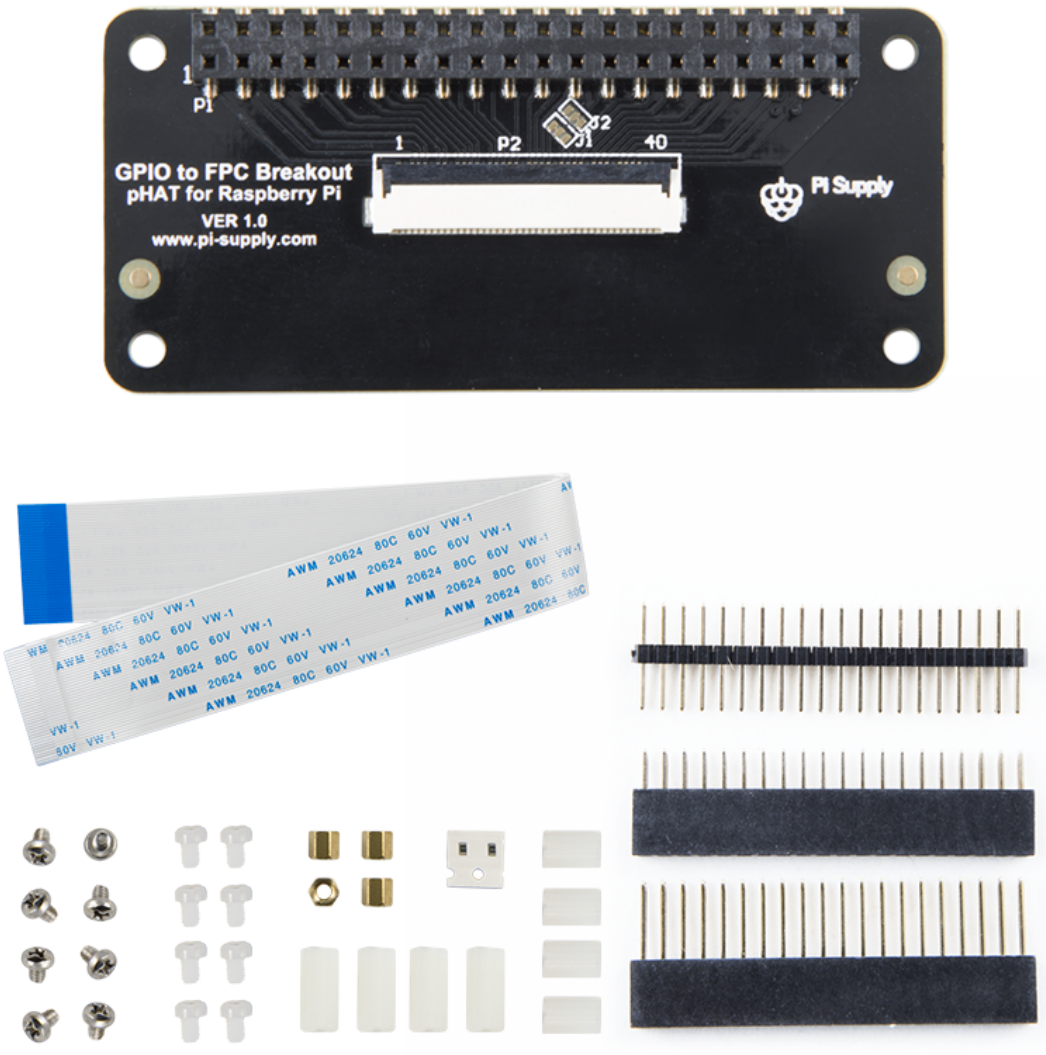
- Connecting your FPC display pHAT to the Raspberry Pi
- How to mount your GPIO to FPC pHAT to your Raspberry Pi
    - Option 1
    - Option 2
    - Option 3
- SPI Chip Select

Compatible with various add-on boards

- PaPiRus HAT ePaper/eInk Display
- PaPiRus Zero ePaper/eInk pHAT display
- Pi Supply Media Centre HAT
- Official Raspberry Pi display
- Other add-on boards with the same display FPC connector

Whats in the box?



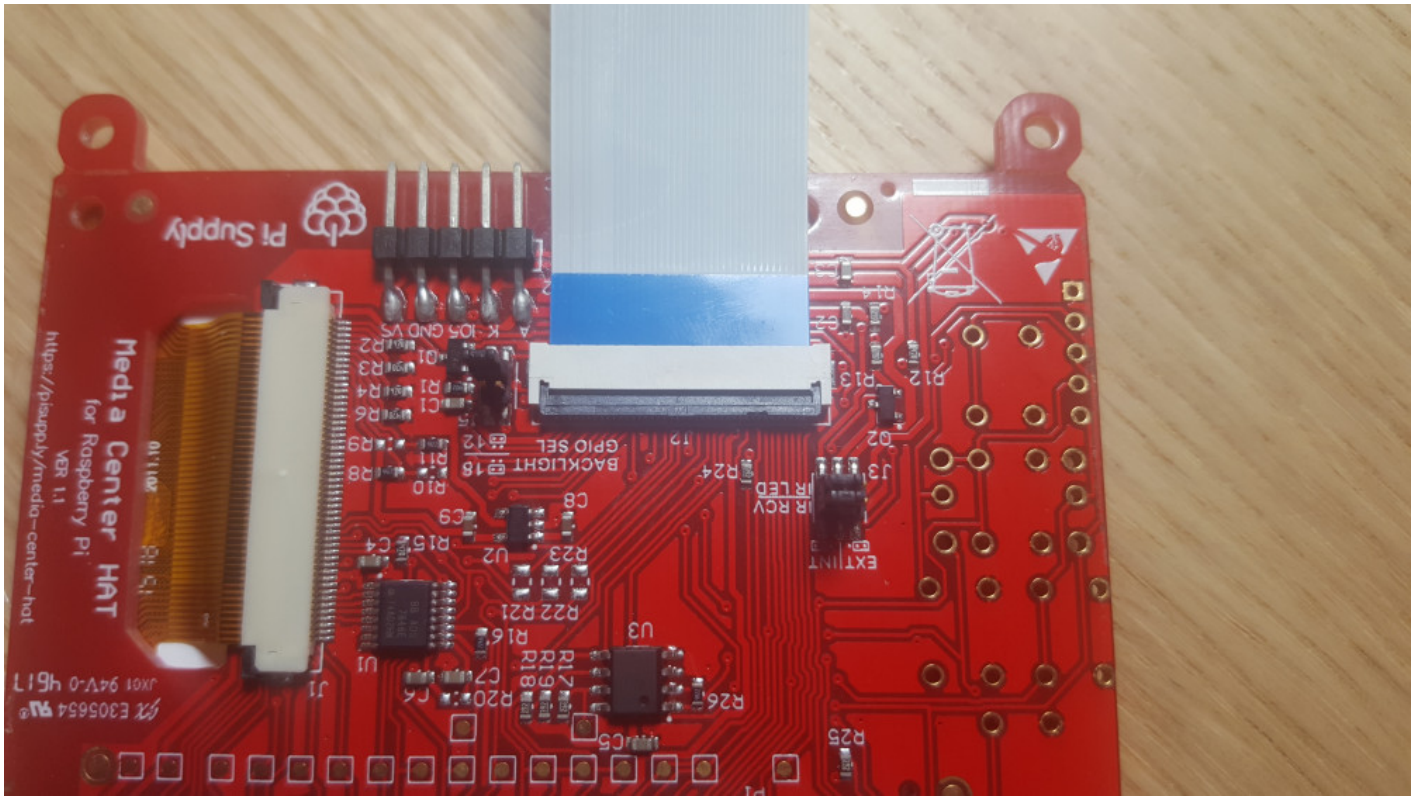
The Pi Supply GPIO to FPC Breakout pHAT includes all of the following parts:

- GPIO adaptor PCB with mounted FFC socket
- 200mm FFC cable
- Various mounting hardware screws/standoffs
- 1x 60mm+55mm male to male 40 way header
- 1x 10mm+8.5mm male to female 40 way header
- 1x 4.91mm+8mm male to female 40 way header
- 2x 0 ohm resistors (0605)

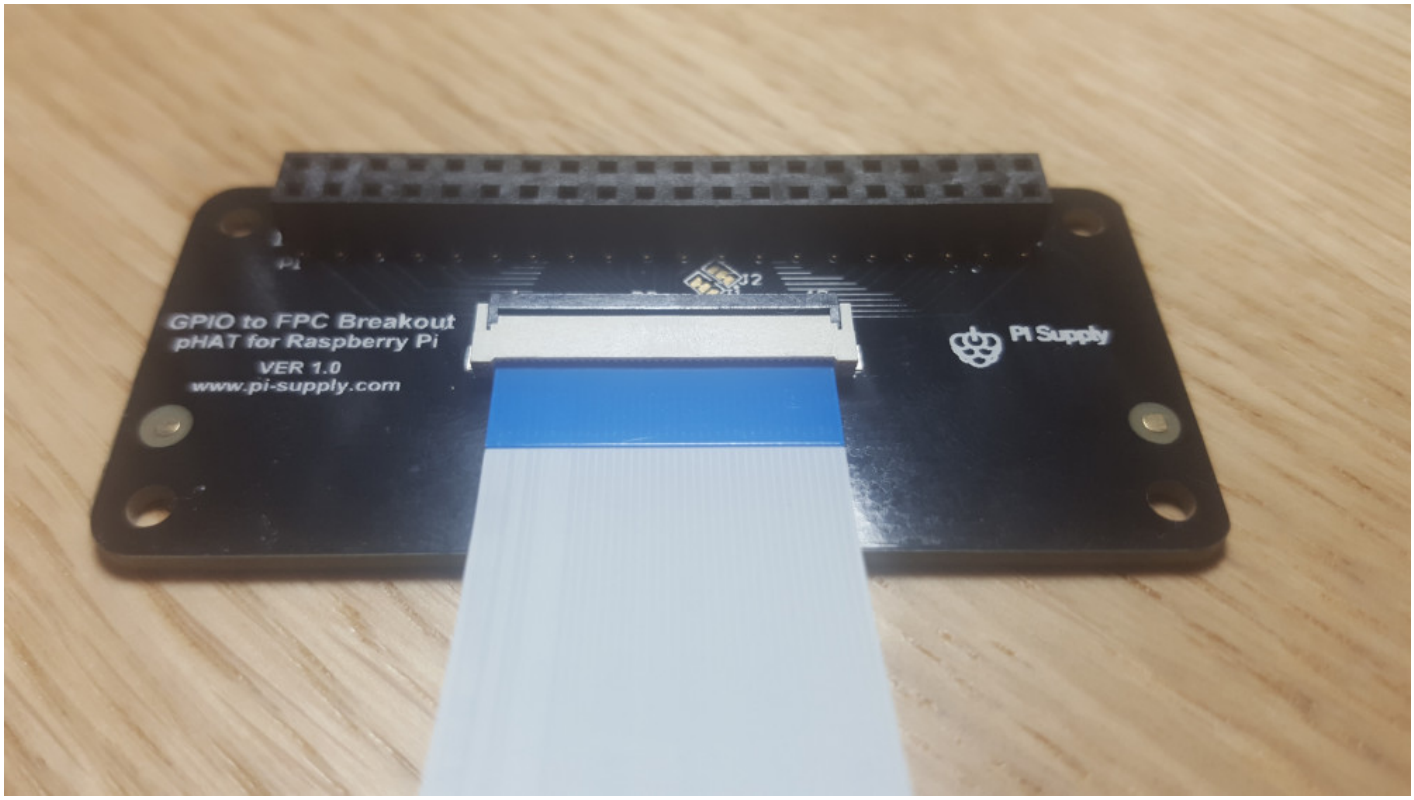
Breaking out the GPIO pins from the Pi

Most display HATs for the Raspberry Pi do not allow users to breakout and use the spare GPIO pins on the Raspberry Pi 40 way header. Below is a quick guide showing you how to connect the GPIO to FPC adaptor board for this configuration:

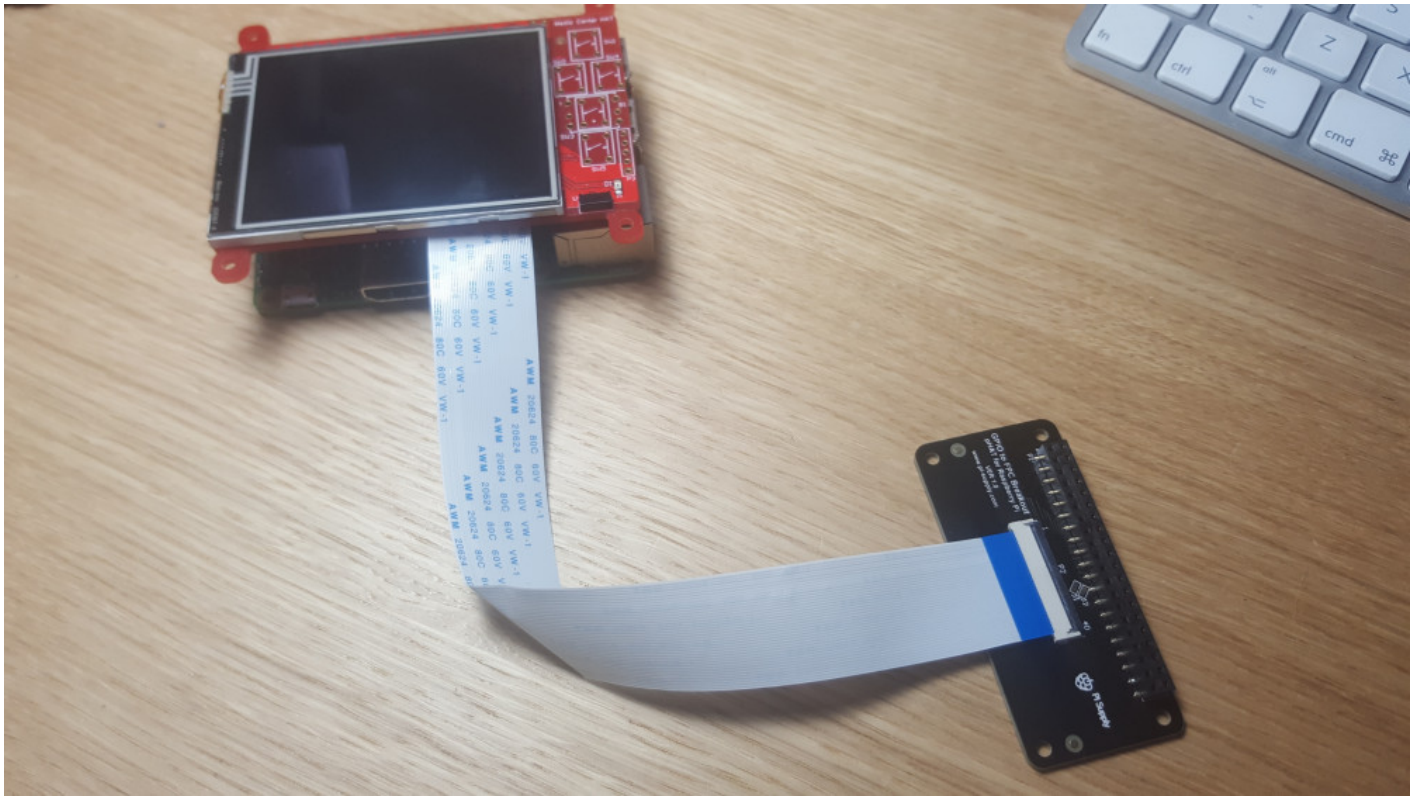
Step 1 - Connect the FFC cable to your display HAT. The display connect usually has a lever on that you can push down or pull up. Pull it up to release the tension of the pins and insert the cable with the blue ribbon facing upwards and then push the lever back down to clamp the FFC cable in place.



Step 2 - Connect the other end of the to the GPIO to FFC socket on the PCB. Once again connect the FFC cable to the connector making sure that the blue ribbon on the cable is facing upwards and the lever on the connector is the same, push down to lock and pull up to unlock.



Step 3 - Now you can connect your display HAT to your Raspberry Pi board.



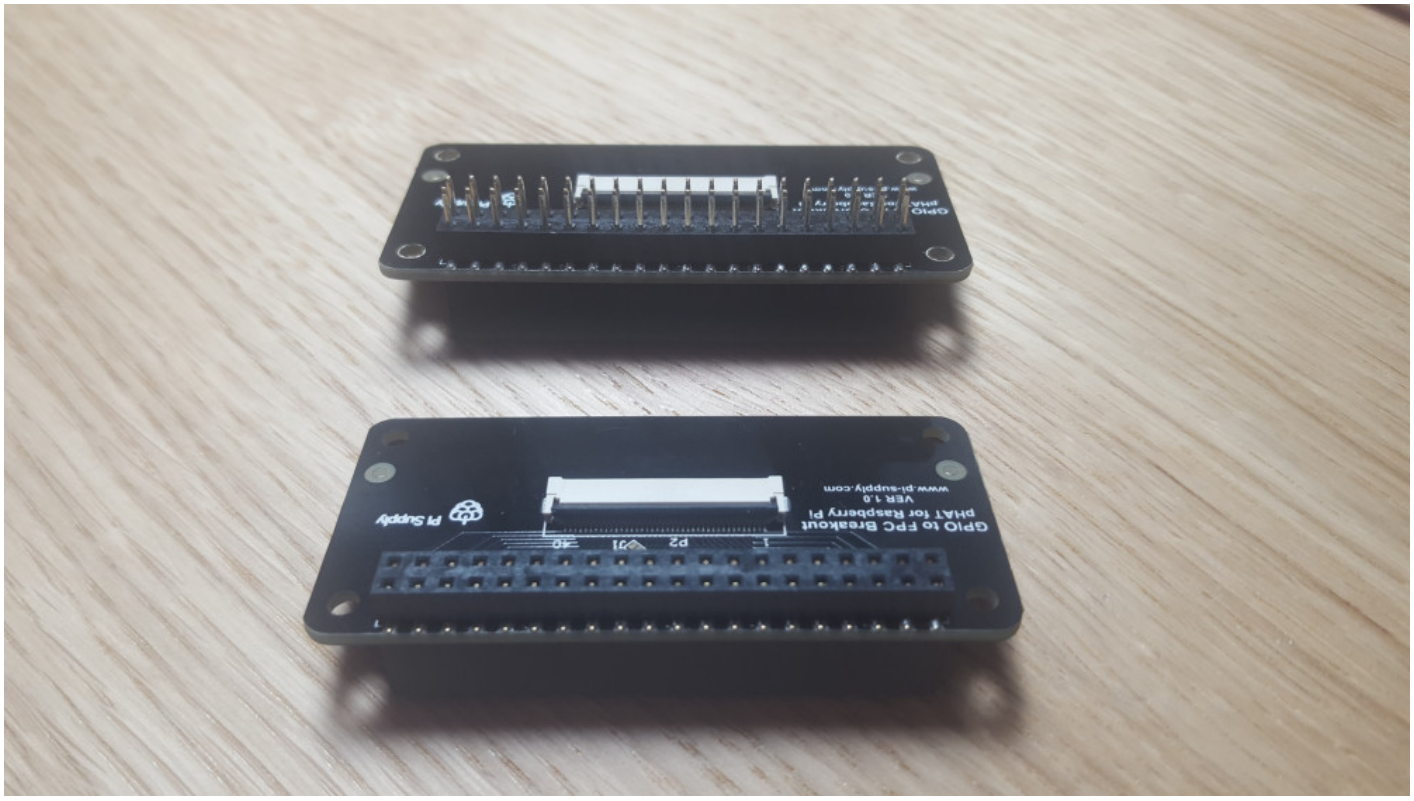
Connecting your FPC display pHAT to the Raspberry Pi

Not only can you breakout the GPIO pins from the Raspberry Pi you can also vice versa the connectors, breaking out a display HAT with an FFC connector on it. This will give you direct access to the Raspberry Pi pins (with a header) whilst mounting your display somewhere else.

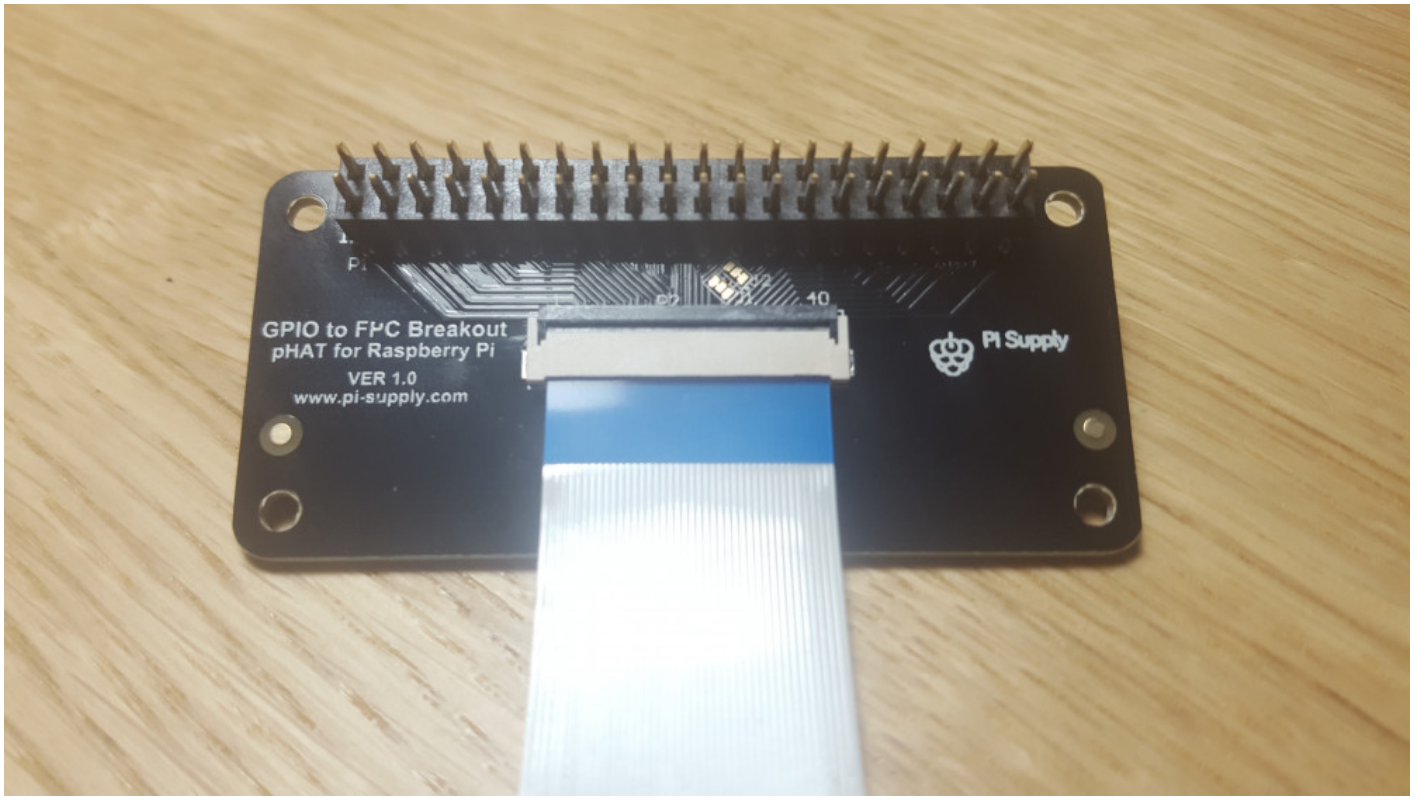
Step 1 - Firstly, you will need to connect one of the headers to the GPIO to FPC pHAT board in order to insert it onto the Raspberry Pi 40 way GPIO header, or if you have a Pi Zero then you can connect the board directly to the male GPIO header. There are a few ways in which you can accomplish this:

- Female to Male (short) header
- Female to Male (long) extending header
- Without any header on Pi Zero or Pi Zero W

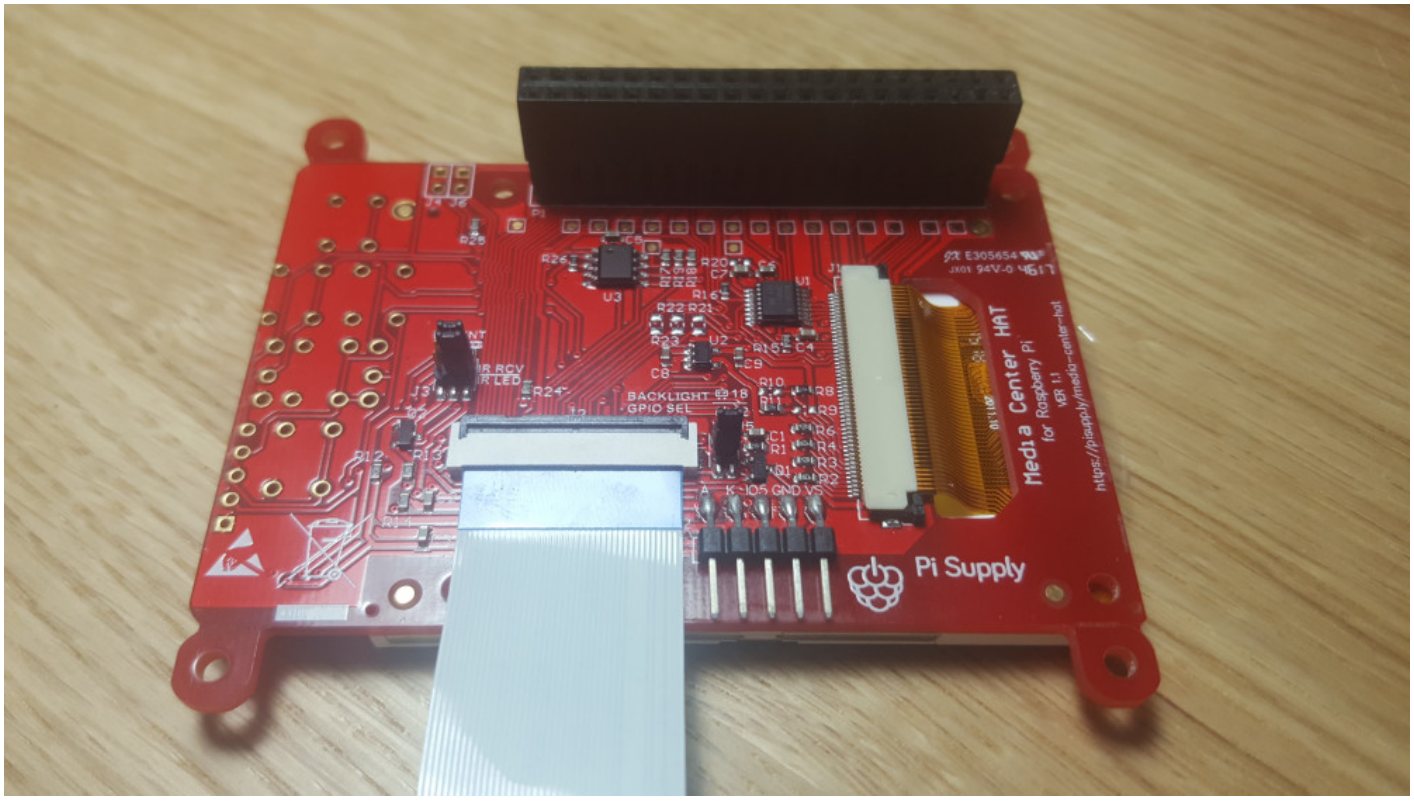
The extending header will allow you to also stack an additional HAT or pHAT board on top of the breakout board or even another GPIO to FPC pHAT.



Step 2 - Connect the FFC cable to your GPIO to FPC pHAT board making sure that the blue ribbon is facing upwards. The FFC connector had a lever which you can push down to lock the ribbon cable in place or pull up to release/insert.



Step 3 - Connect the other end of the FFC cable to your display board. Remember to make sure that the blue ribbon is facing upwards when connecting to the display HAT.



Step 4 - Insert the GPIO to FPC pHAT to your Raspberry Pi header.

GPIO to FPC Breakout
pHAT for Raspberry Pi
Pi Supply
Media Center HAT
SW1
SW2
SW4
B1
SW3
SW5
D1
P3
U4
VW-1
60V
80C
AWM
20624

How to mount your GPIO to FPC pHAT to your Raspberry Pi

There are a couple of ways in which you can mount the pHAT board to your Raspberry Pi with the included screws/standoffs:

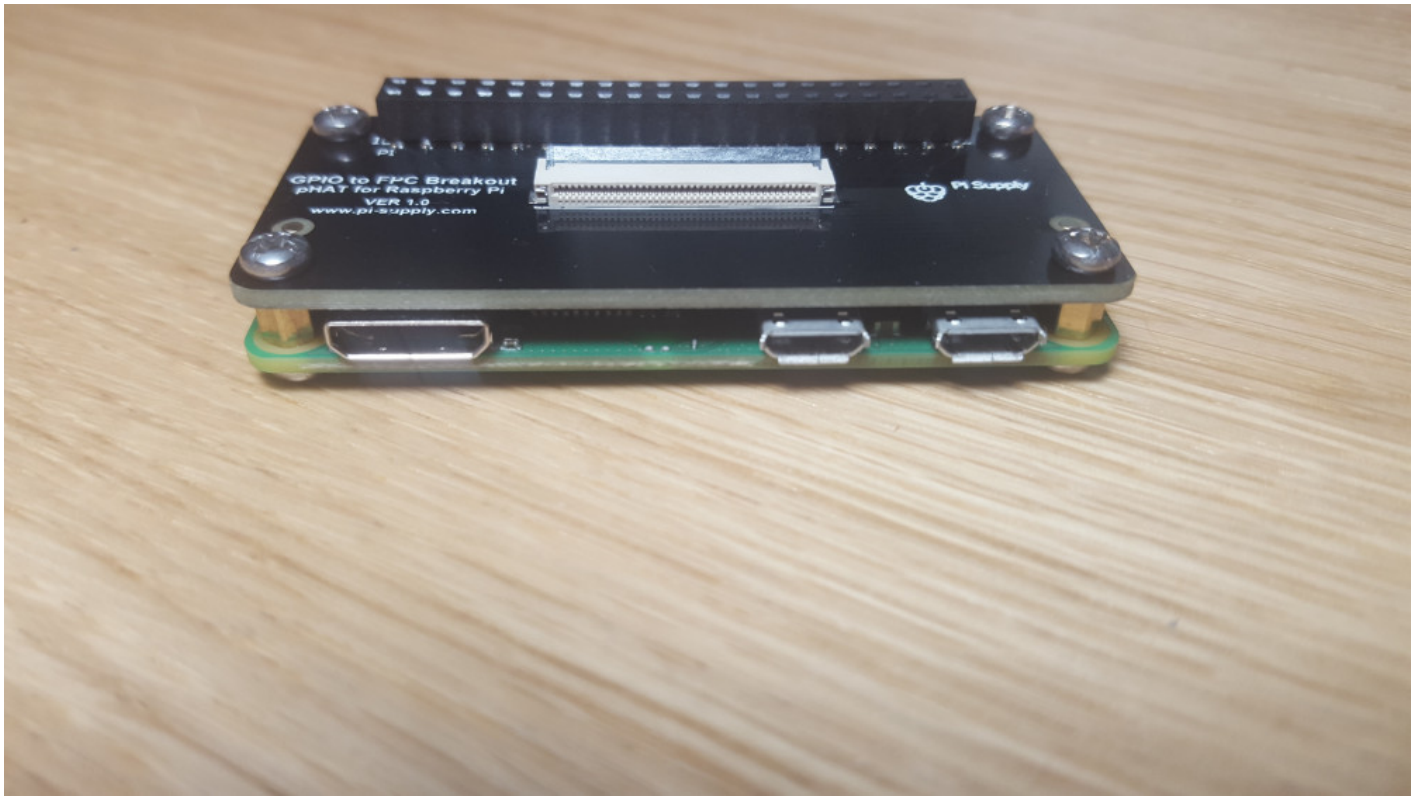
Option 1 - Direct connection without any header

You can insert the pHAT directly on top of the Raspberry Pi Zero and use the included brass standoffs to secure it in place.

Step 1 - Screw the brass standoffs to your Pi Zero board. The best way to do this is to insert the screw into the mounting hole from under the Pi Zero board and the screw on the brass standoff on top.

Step 2 - Carefully insert the pHAT board on to the Raspberry Pi header and then screw down the board with the raining screws from the top.

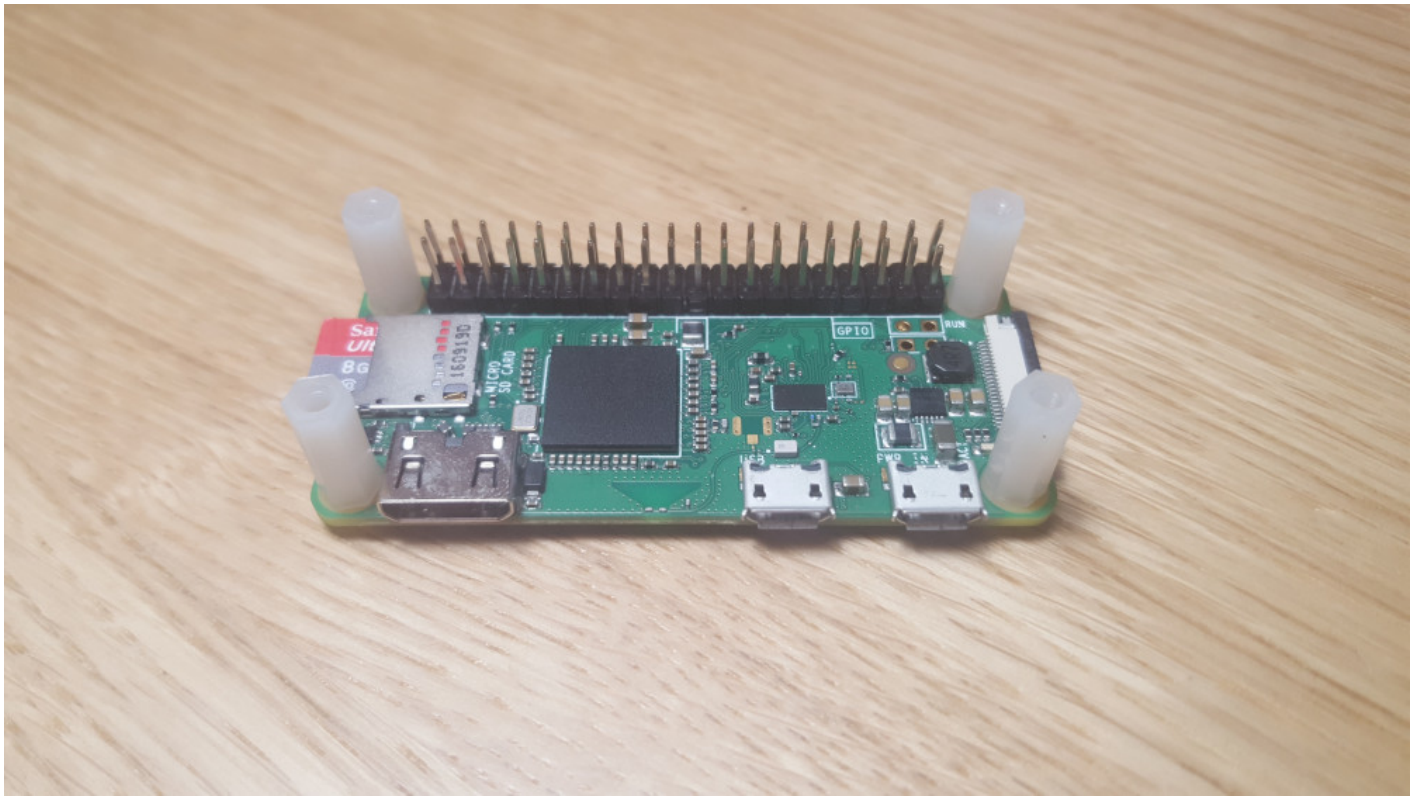
Note: You will need a small Philips screwdriver to secure the pHAT in place on the Pi Zero.



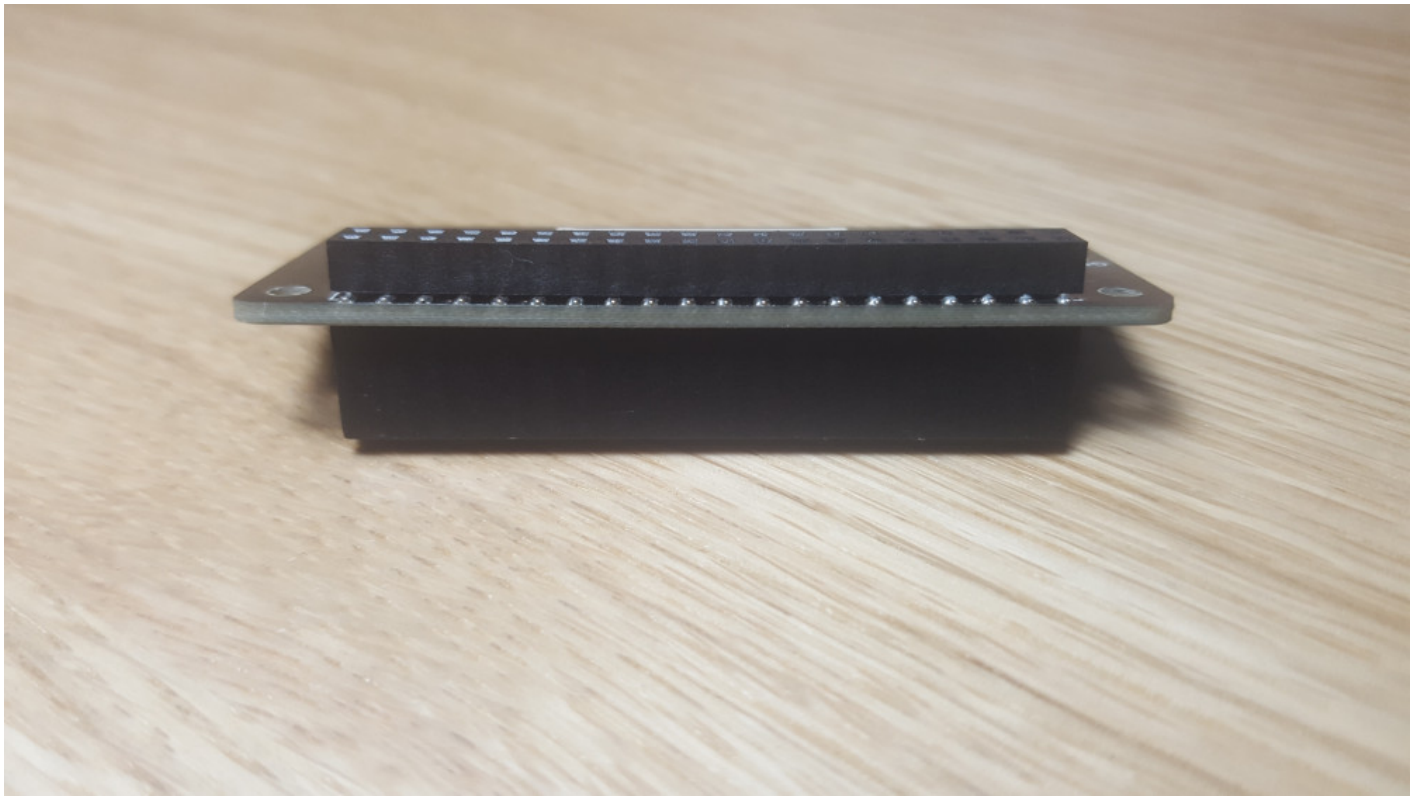
Option 2 - Female to Male header (Short)

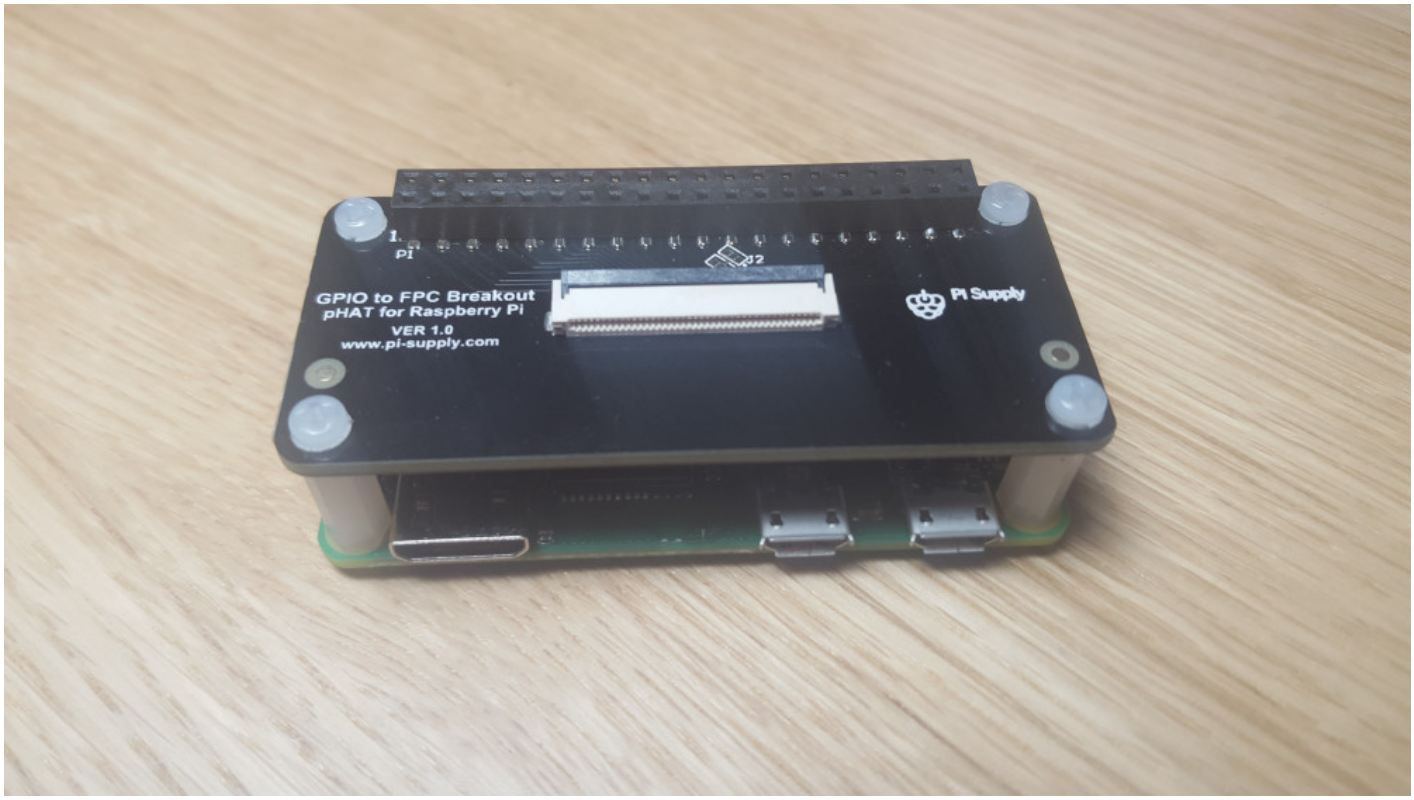
This header is primarily used for stacking on to of the standard Raspberry Pi but it can also be used for the Pi Zero and any other Pi board. This header allow you to stack on top of the Raspberry Pi GPIO header but does not give you any additional stacking options for other HATs..

Step 1 - Take the 12mm nylon standoffs and screw them into the mounting holes with the provided nylon screws from underneath the Raspberry Pi board.



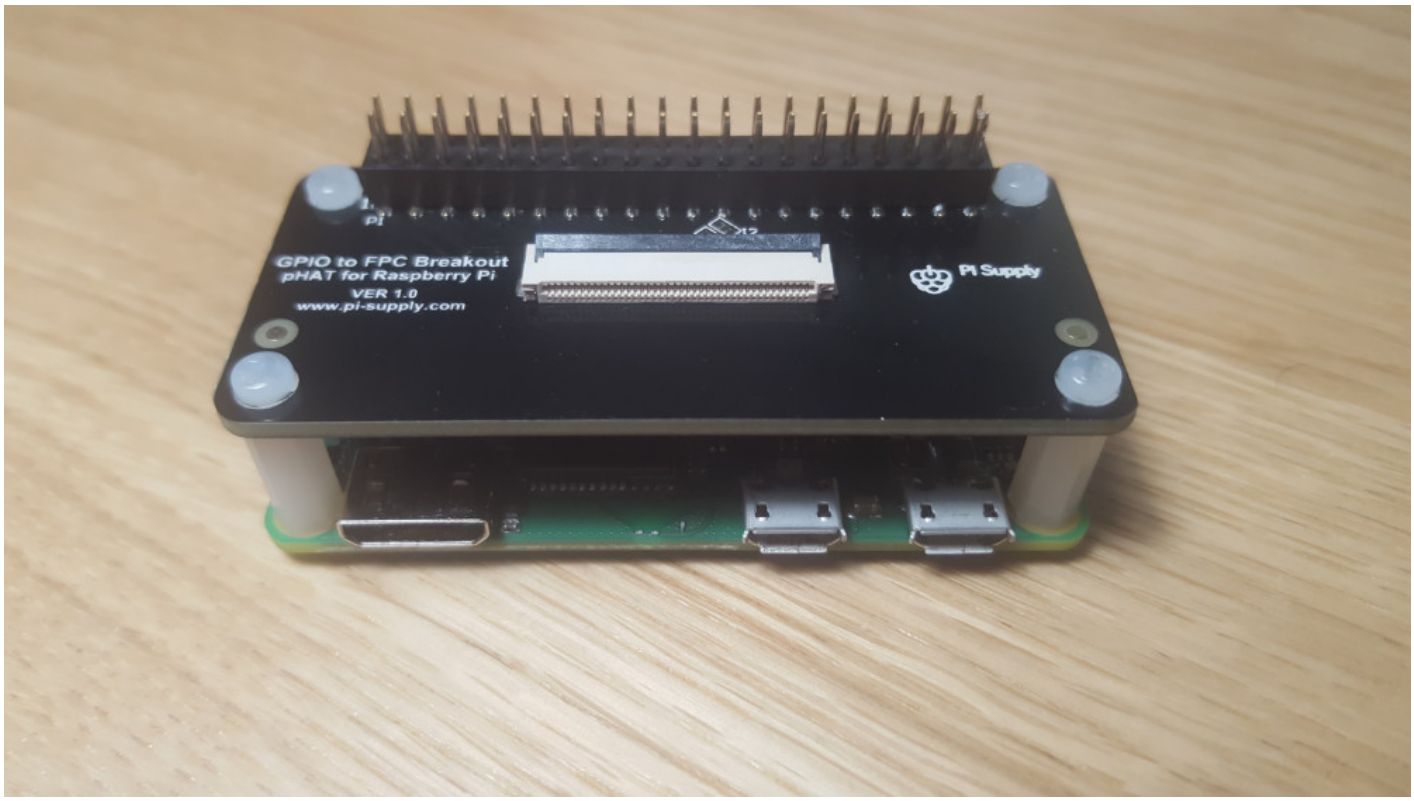
Step 2 - Insert the 40 way header into the pHAT board and then insert the pHAT board on top of the Raspberry Pi (It is important that it is done in this way). You should now be able to screw down the pHAT board using the remaining nylon screws.




GPIO to FPC Breakout
pHAT for Raspberry Pi
VER 1.0
www.pi-supply.com
Pi Supply

Option 3 - Female to Male header (Long)

This option gives you the ability to stack other HATs,pHATs on top of the Raspberry Pi board giving you much more flexibility interns of your projects and additional peripherals. To stack this header simply follow the instructions for option 2.



SPI Chip Select

You will note on the GPIO to FPC pHAT that there are two jumpers, J1 and J2. These jumpers are used for swapping SPI chip select CE0 and CE1 so you can attach two SPI HATs to the Raspberry Pi using the same SPI CE GPIO.