CYBERDECK Bonnet and HAT for Raspberry Pi 400

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https://learn.adafruit.com/cyberdeck-bonnet-and-hat

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Overview

Howdy keyboard cowboys, are you surfing the information superhighway with a Pi 400? Want a cool heads-up display, or maybe you need to wire up some NeoPixel wetware...?

Cyber-warriors, listen up here! We’ve got with some zero-day unreleased hardware we just dumpster-dived. Now you can crack kodes, and write skripts with style, thanks to the CYBERDECK HAT and Bonnet for Raspberry Pi 400 from Adafruit zaibatsu.
Well, we just fenced 12 megabytes of ram and some angled socket header from the underground hacker club next to the chatsubo, and it's a major upgrade to our extender board - now you can jack in any Pi bonnet or HAT into the back of your Pi 400's skull at a cool angle, perfect for augmenting your deck!

We also give you two STEMMA (JST 3-PH) connectors on GPIO #18 and #13, and twin STEMMA QT I2C port plugs, for additional upgrades ([cables sold separately](#))
This is the same hardware Kevin Mitnick used when he popped Sidewinder! Ok, maybe not, but it will definitely let you create a stand-alone Kali deck by plugging in one of our many display Bonnets or HATs.

Comes completely pre-assembled and tested so you don't need to do anything but plug it in. Works best with the Pi 400 computer.

The demo images show the Bonnet with one of our 128x32 OLED bonnets plugged in. Any bonnet/mini-HAT/pHAT etc should work just fine with the Bonnet as every pin is duplicated from input to output.
Here are some of our favorite displays we recommend for the Bonnet:

- Adafruit 2.23" Monochrome OLED Bonnet for Raspberry Pi
- Adafruit 2.13" Monochrome E-Ink Bonnet for Raspberry Pi - THINK INK
- Adafruit 128x64 OLED Bonnet for Raspberry Pi
- Adafruit Mini PiTFT 1.3" - 240x240 TFT Add-on for Raspberry Pi
- Adafruit Mini PiTFT - 135x240 Color TFT Add-on for Raspberry Pi
- Adafruit 1.3" Color TFT Bonnet for Raspberry Pi - 240x240 TFT + Joystick Add-on
- Adafruit PiOLED - 128x32 Monochrome OLED Add-on for Raspberry Pi
- Pimoroni Inky pHAT for Raspberry Pi - 3 Color eInk Display
- Pimoroni Inky pHAT - 3 Color eInk Display - Yellow/Black/White
- Pimoroni Inky pHAT - eInk Display - Black/White
Here are some of our favorite displays we recommend for the HAT:

- Adafruit PiTFT 2.2" HAT Mini Kit - 320x240 2.2" TFT - No Touch
- Adafruit PiTFT 2.4" HAT Mini Kit - 320x240 TFT Touchscreen
- PiTFT Plus Assembled 320x240 2.8" TFT + Resistive Touchscreen
- PiTFT 2.8" TFT 320x240 + Capacitive Touchscreen for Raspberry Pi
- Adafruit PiTFT Plus 320x240 2.8" TFT + Capacitive Touchscreen
- Adafruit PiTFT - 320x240 2.8" TFT+Touchscreen for Raspberry Pi
- PiTFT Plus 320x240 3.2" TFT + Resistive Touchscreen
- PiTFT - Assembled 480x320 3.5" TFT+Touchscreen for Raspberry Pi
- PiTFT Plus 480x320 3.5" TFT+Touchscreen for Raspberry Pi
- Pimoroni HyperPixel - 4.0" Hi-Res Display for Raspberry Pi
- Pimoroni HyperPixel - 4.0" Hi-Res Display for Raspberry Pi - Non-Touch
- Pimoroni Inky wHAT (ePaper/eInk/EPD) - Red/Black/White
- Pimoroni Inky wHAT (ePaper/eInk/EPD) - Black/White
- Pimoroni HyperPixel 4.0 Square - Touch Display for Raspberry Pi - Capacitive Touch - PIM470
Pinouts

I2C Connectors

- STEMMA QT - These are the smaller connectors on either side of the HAT and Bonnet. You can use [STEMMA QT cables](https://www.adafruit.com/product/4209) (sold separately) to connect up [a bunch of different sensors and breakouts](https://www.adafruit.com/product/4209) with no soldering or breadboard needed!

- These two connectors are connected together in parallel. You can daisy-chain sensors and breakouts connected to them.

[STEMMA QT / Qwiic JST SH 4-pin to Premium Male Headers Cable](https://www.adafruit.com/product/4209)

This 4-wire cable is a little over 150mm / 6" long and fitted with JST-SH female 4-pin connectors on one end and premium Dupont male headers on the other.

Compared with the...
STEMMA QT / Qwiic JST SH 4-pin Cable - 100mm Long
This 4-wire cable is a little over 100mm / 4” long and fitted with JST-SH female 4-pin connectors on both ends. Compared with the chunkier JST-PH these are 1mm pitch instead of...
https://www.adafruit.com/product/4210

STEMMA (3-pin JST PH) Connectors

• These are the larger connectors on either side of the HAT and Bonnet. You can use these to connect up NeoPixels and more with no soldering or breadboard required! (Cables sold separately.)
• They are labeled with their pin numbers: 18 and 13.

Here are some accessories we recommend using with your STEMMA JST PH connectors!

STEMMA JST PH 2mm 3-Pin to Male Header Cable - 200mm
This cable will let you turn a JST PH 3-pin cable port into 3 individual wires with high-quality 0.1" male header plugs on the end. We're carrying these to match up with our...
https://www.adafruit.com/product/3893

STEMMA JST PH 2mm 3-Pin to Female Socket Cable - 200mm
This cable will let you turn a JST PH 3-pin cable port into 3 individual wires with high-quality 0.1" female header sockets on the end. We're carrying these to match up with...
https://www.adafruit.com/product/3894
JST PH 2mm 3-pin Plug to Color Coded Alligator Clips Cable
This cable will let you turn a JST PH 3-pin cable port into 3 individual wires with grippy mini alligator clips. We’re carrying these to match up with any of our boards or...
https://www.adafruit.com/product/4030

Adafruit NeoPixel LED Strip with 3-pin JST PH 2mm Connector
Plug in and glow, this Adafruit NeoPixel LED Strip with JST PH Connector has 30 total LEDs in a "60 LED per meter" spacing,...
https://www.adafruit.com/product/3919

Adafruit STEMMA Non-Latching Mini Relay - JST PH 2mm
STEMMA plug-and-play parts make your next project soldering-free! This is the STEMMA Non-Latching Mini Relay. It gives you power to control, and control over...
https://www.adafruit.com/product/4409

Raspberry Pi Headers

On the top and bottom of the HAT and Bonnet are the Raspberry Pi headers.

- The bottom is meant to plug into a Pi (works best with Pi 400!). They are at an angle to facilitate the Pi 400.
- The top headers are to allow you to plug in a HAT or Bonnet. The pinouts are identical - just plug in any HAT or Bonnet!
**Adafruit 2.23" Monochrome OLED Bonnet for Raspberry Pi**
If you're looking for a bright, readable OLED display for a Raspberry Pi (most likely a
[https://www.adafruit.com/product/4567](https://www.adafruit.com/product/4567))

**PiTFT Plus 480x320 3.5" TFT+Touchscreen for Raspberry Pi**
Is this not the cutest, little display for the Raspberry Pi? It features a 3.5" display with 480x320 16-bit color pixels and a resistive touch overlay
[https://www.adafruit.com/product/2441](https://www.adafruit.com/product/2441)

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**Fixing Pin Conflicts**

Both CYBERDECKs include 2 general purpose 3-pin STEMMA connectors. One is connected to GPIO pin 18 and the other is connected to GPIO pin 13:

Each one of these has some additional protection circuitry in the form of an inline 1K resistor and a diode. The diode is connected to ground.
In general, this shouldn’t be an issue. However, if those same pins are used for an attached display (or other item), then there can be potential conflicts.

One known conflict exists between the Pimoroni HyperPixel 4-inch and GPIO 18. This pin gets used as the SPI chip select for the HyperPixel. It affects both the touch () and non-touch () versions.

If you are having issues getting a Pimoroni HyperPixel display to work with the CYBERDECK HAT or Bonnet, then you may need to make the following modifications.

**Option 1 - Cut a Trace**

This is the potentially easier option since only a sharp edged tool, like an xacto knife is needed. However, this will permanently disable the #18 STEMMA connector.

To make this modification, carefully use a sharp edged tool like an xacto knife and score the trace here until it is cut through:

Newer versions of the CYBERDECK include a cuttable trace jumper:
The original version of the CYBERDECK lacked the cuttable jumper, so the trace here must be cut:
Option 2 - Remove the Diode (original version only!)

Newer versions of the CYBERDECK include cuttable trace jumpers - see Option 1.

This option is best done using a soldering iron or hot air gun to heat up the solder holding the diode down. The STEMMA connector will remain connected, through the 1k resistor, to GPIO 18, and will still be functional. However, removing the diode will remove the protection it provides against putting 5V “in” to the STEMMA connector. So just be aware of that.

This is the diode that needs to be removed:

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Downloads

Files:

- [Fritzing object for HAT in Adafruit Fritzing Library](https://fritzing.org)
- [Fritzing object for Bonnet in Adafruit Fritzing Library](https://fritzing.org)
- [EagleCAD PCB files on GitHub](https://github.com)
- [3D Model for HAT on GitHub](https://github.com)
- [3D Model for Bonnet on GitHub](https://github.com)

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Schematic and Fab Print for CYBERDECK Bonnet