```
Error: Can't find stylesheet to import.
  ╷
4 │ @import "gist";
  │         ^^^^^^
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  app/assets/stylesheets/application.pdf.scss 4:9  root stylesheet
```
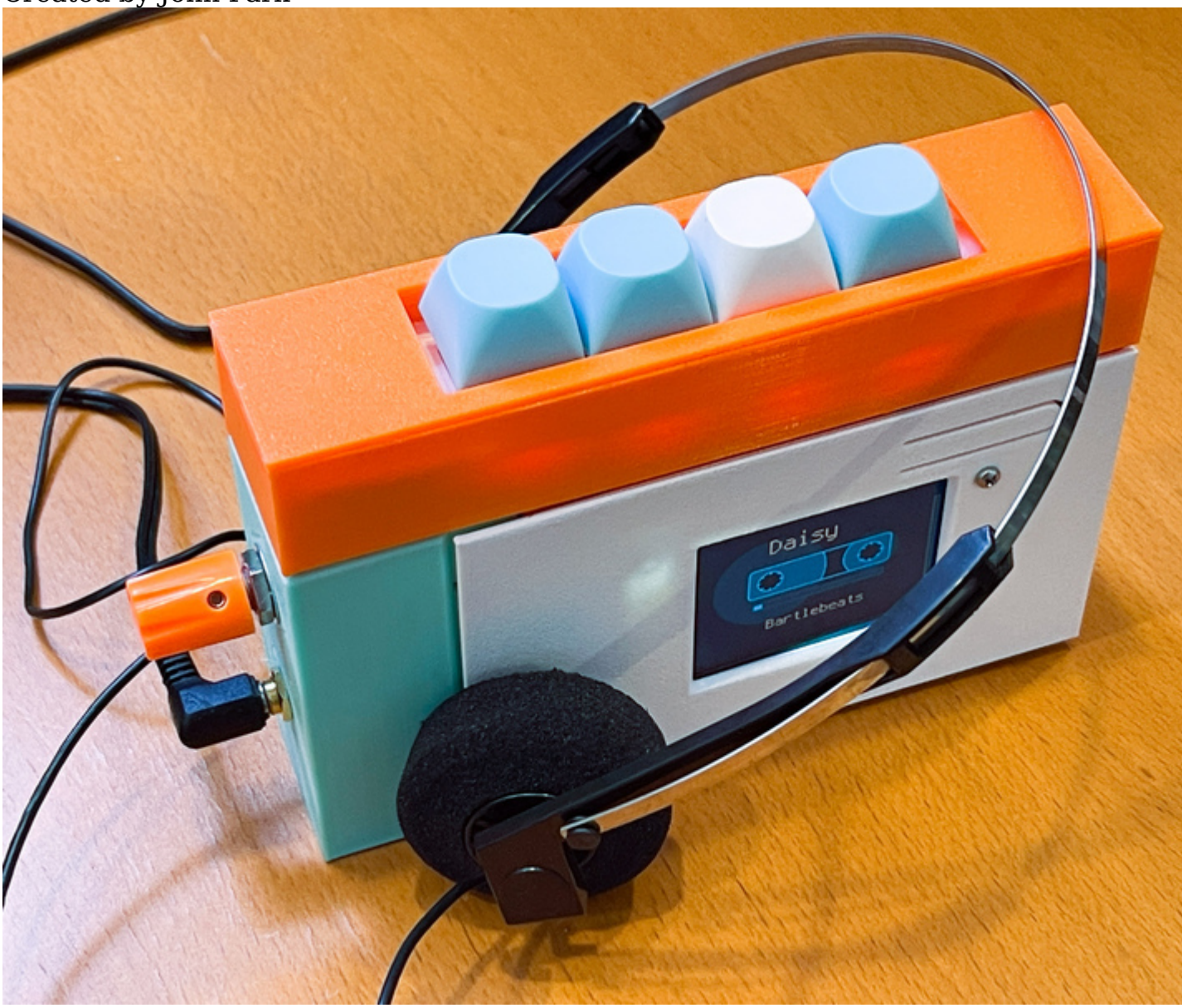

Walkmp3rson: Personal MP3 'Tape' Player

Created by John Park



https://learn.adafruit.com/walkmp3rson-personal-mp3-tape-player
Last updated on 2024-03-28 07:53:49 PM EDT

Table of Contents

Overview

Look the part while you walk around town listening to your favorite mixes. CircuitPython powers this personal music player, with a stylish 3D printed case, TFT display, mech keyswitch controls and more.

Pop in a different "mix tape" SD card when you're in the mood for some different tunes.

Parts

Adafruit
RP2040
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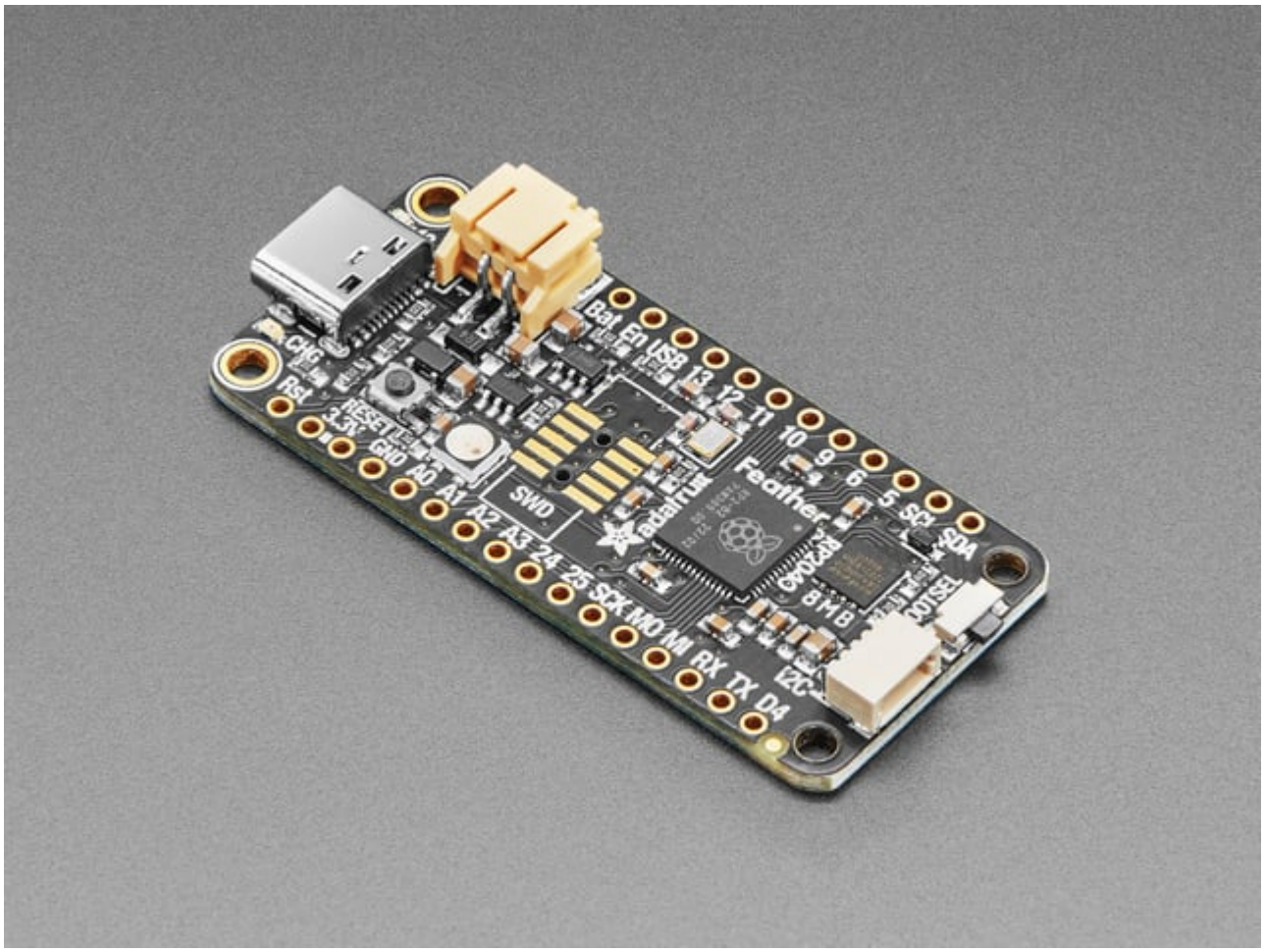

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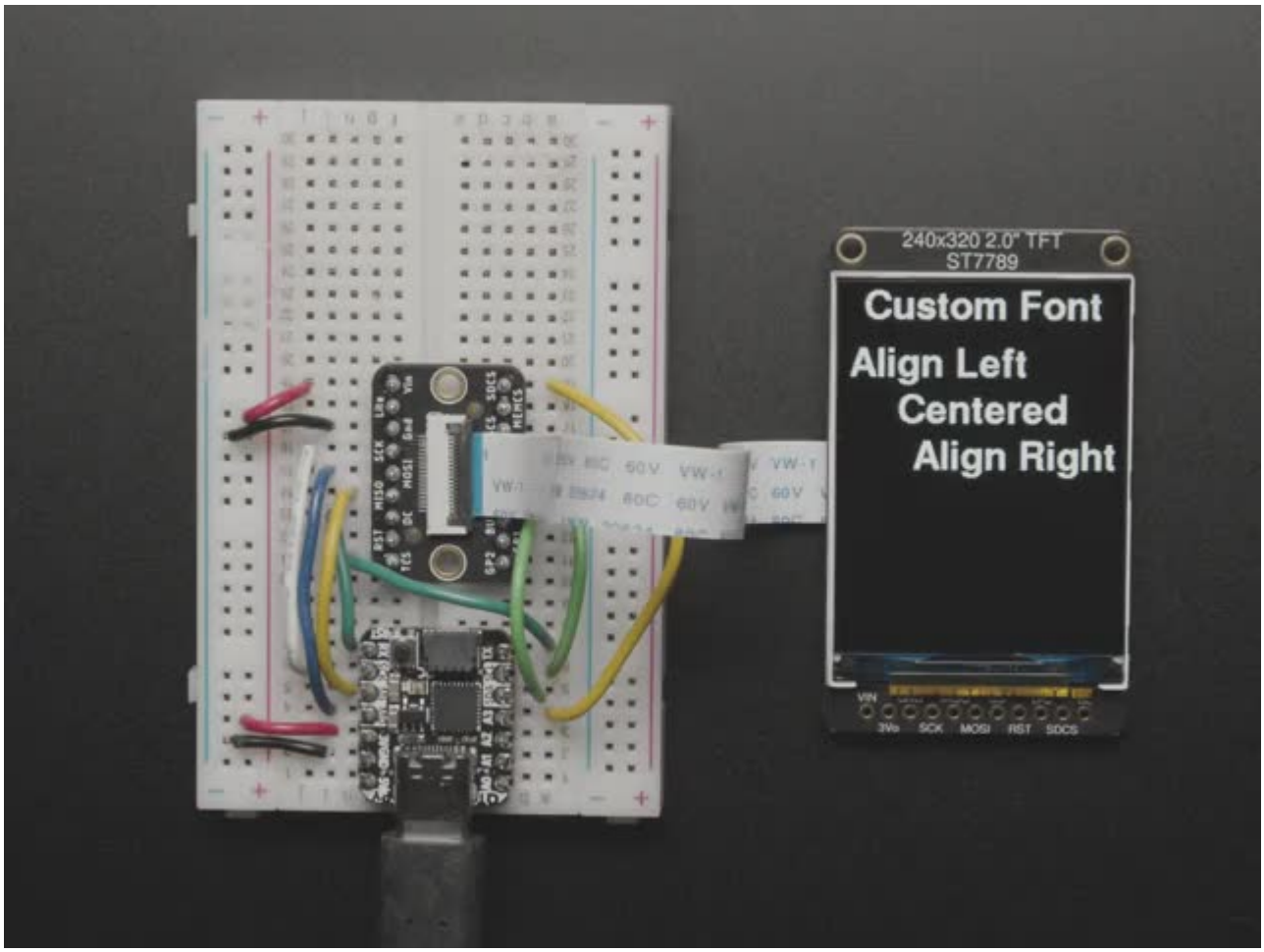

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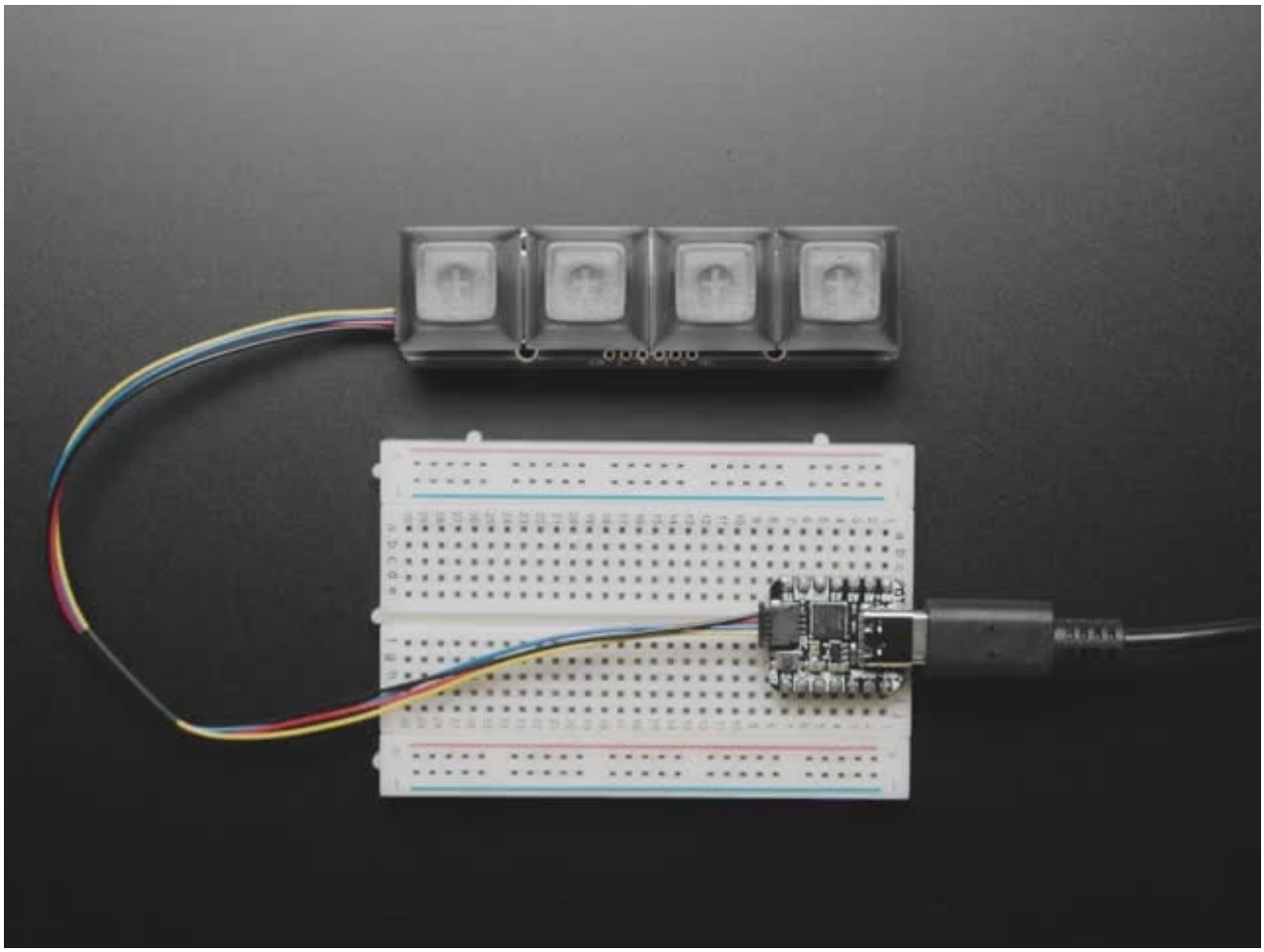

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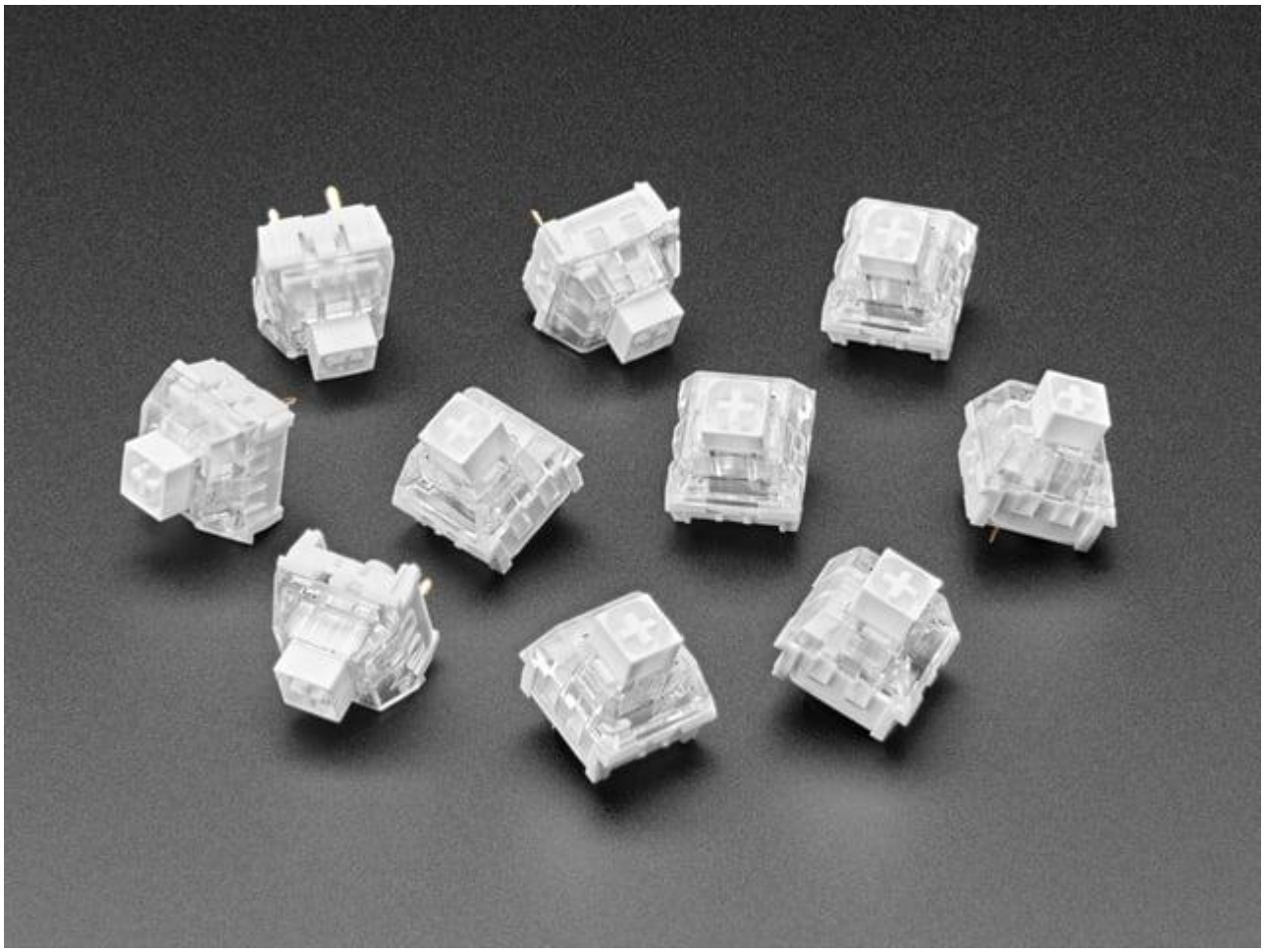

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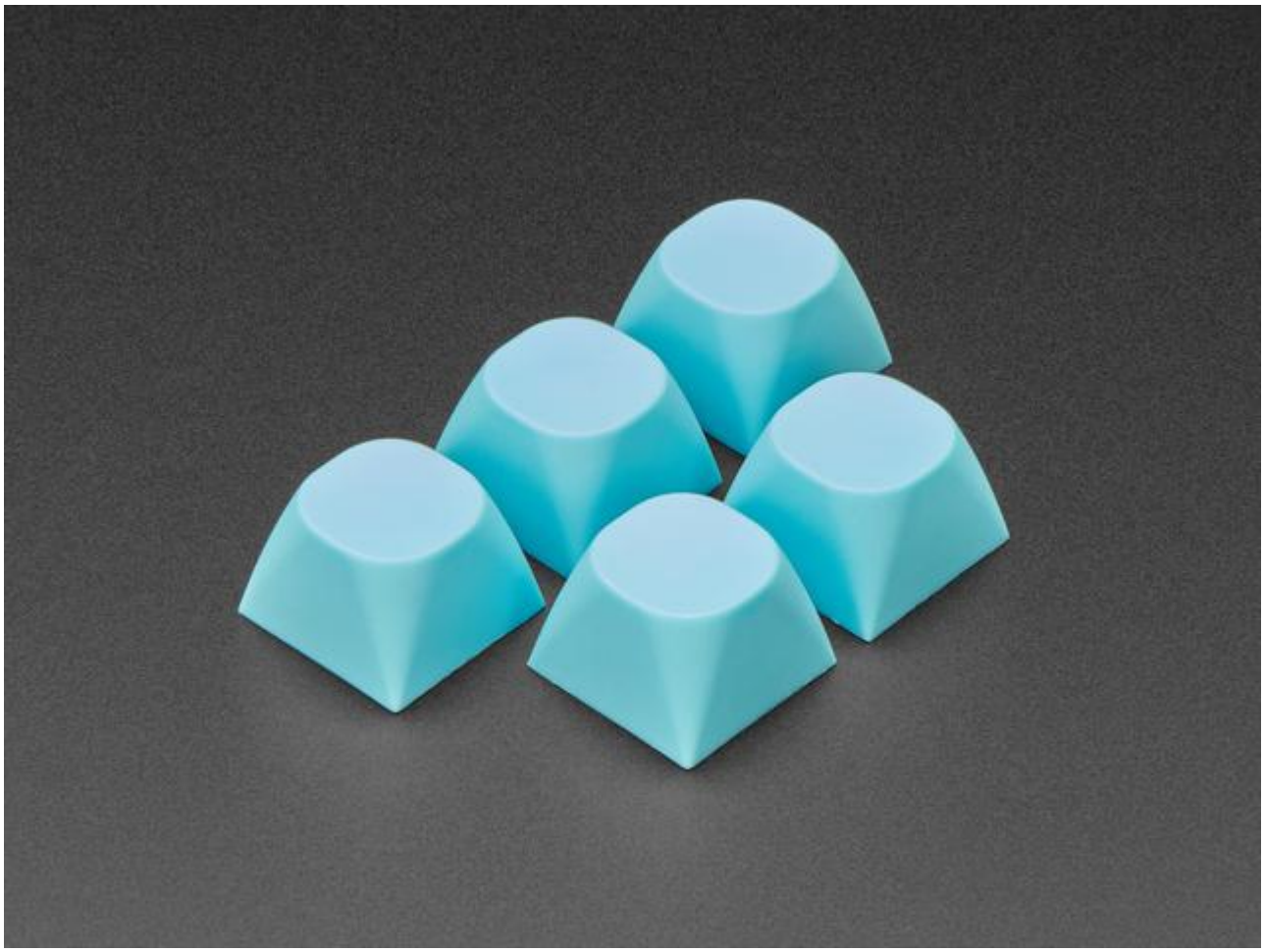

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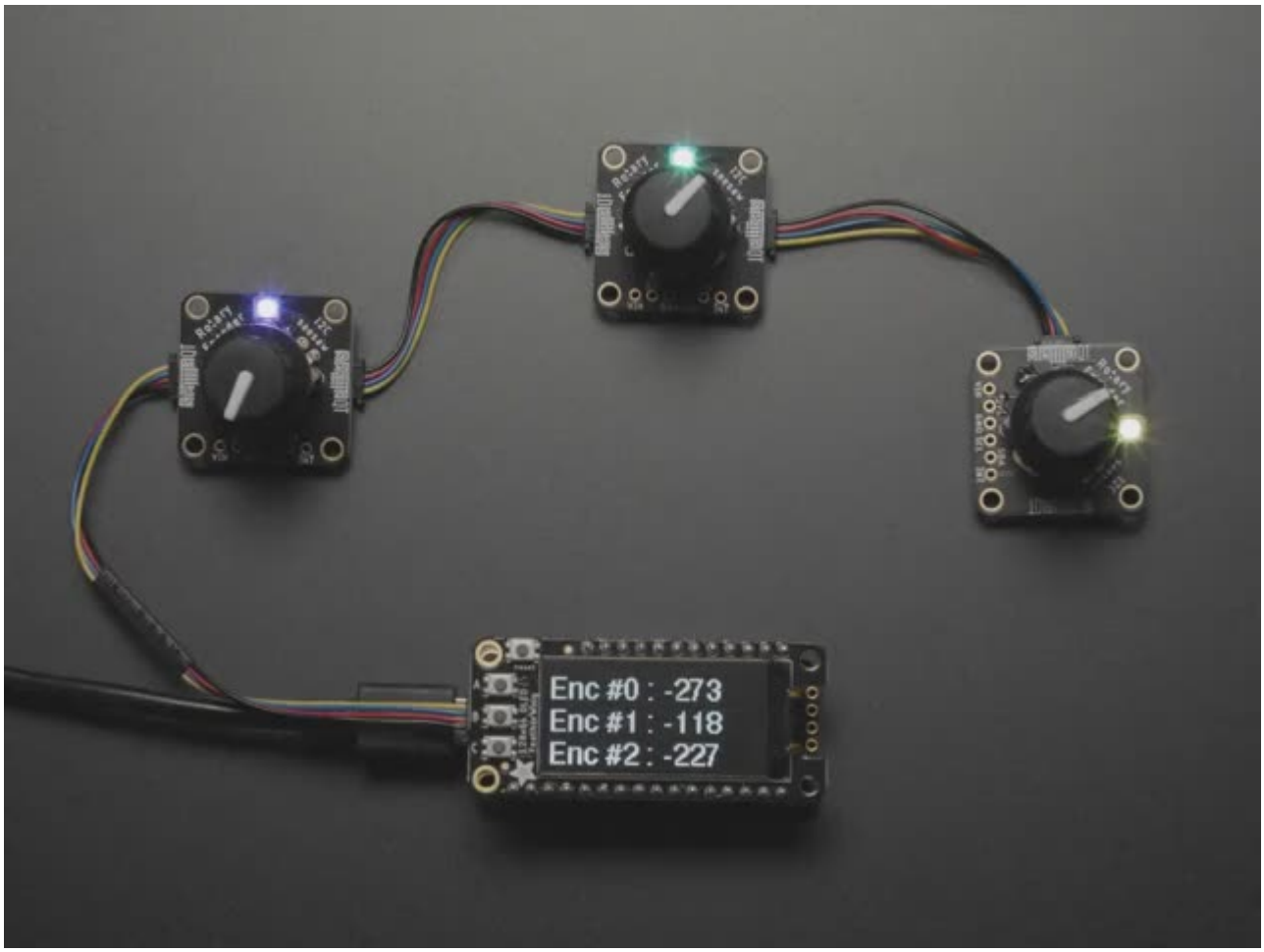

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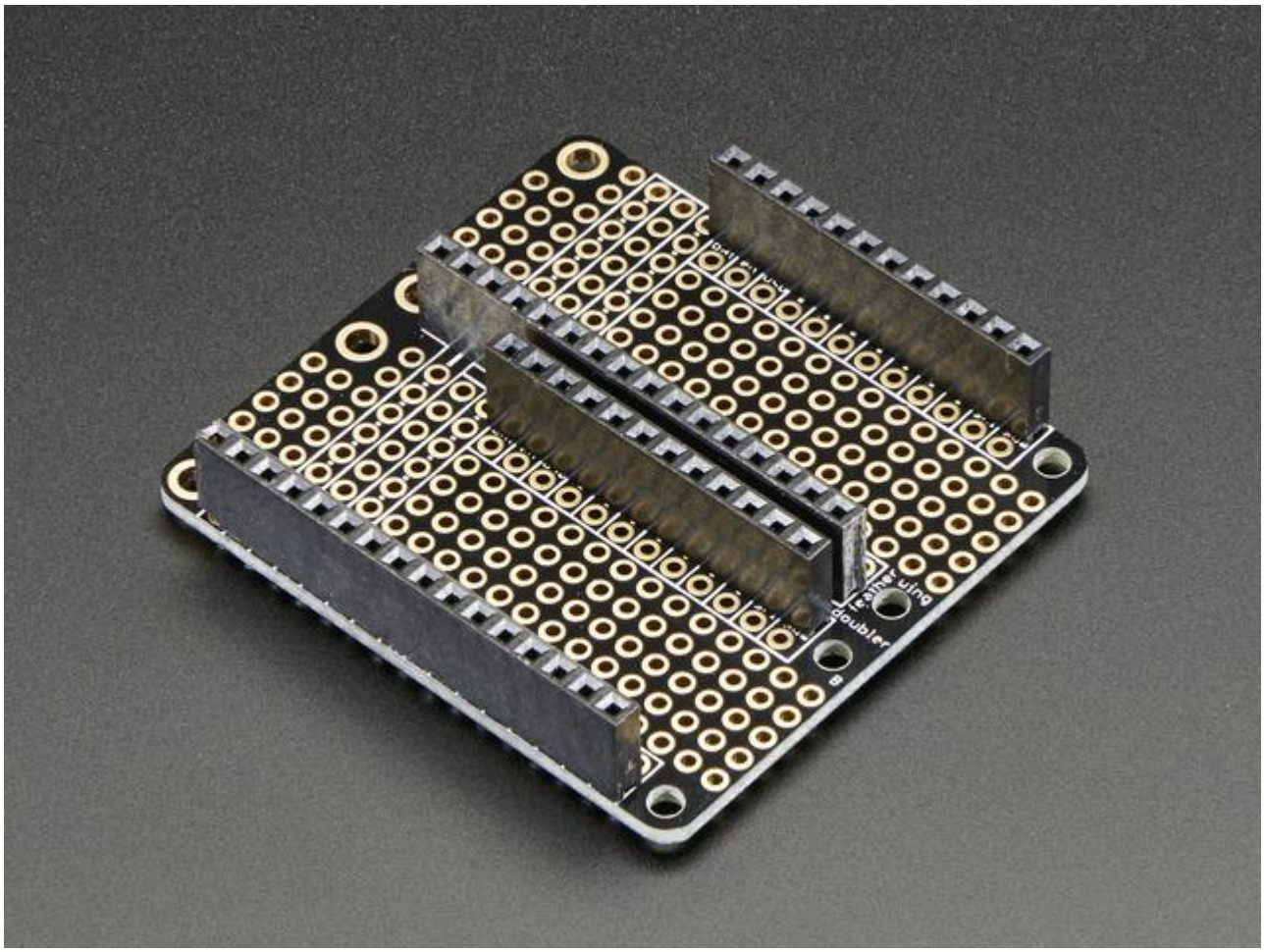

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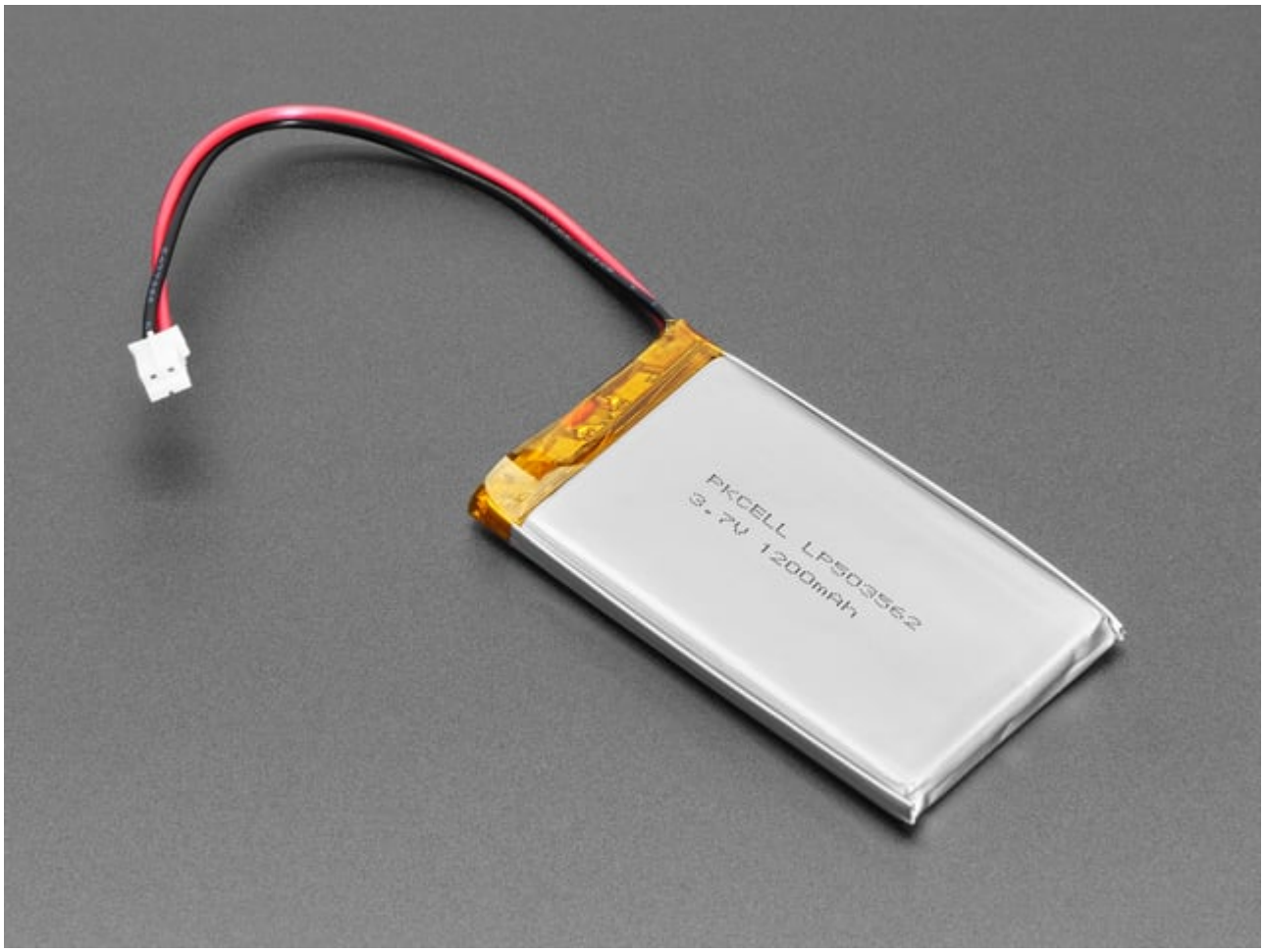

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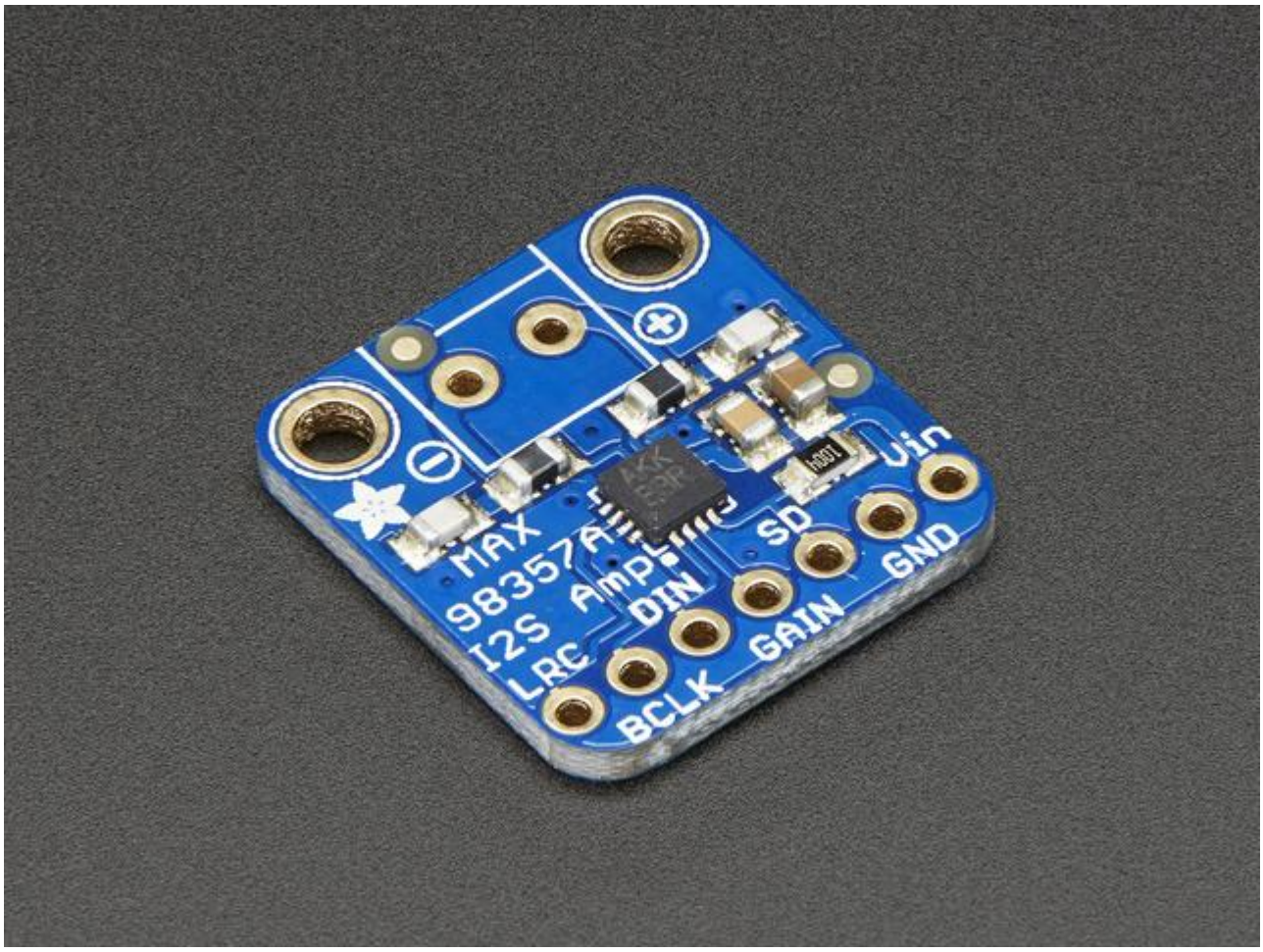
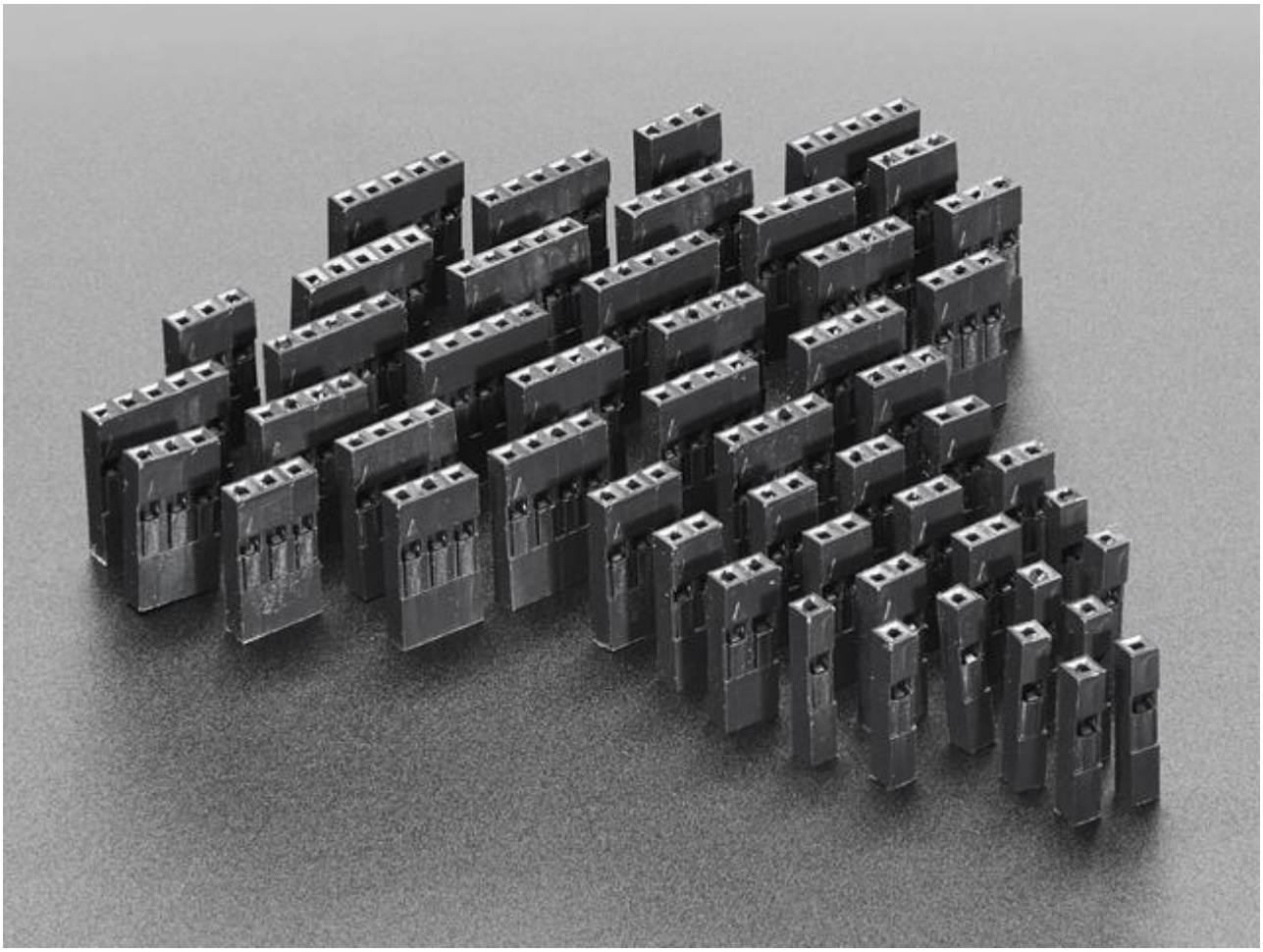


2 x STEMMA QT / Qwiic JST SH 4-pin Cable
100mm Long
https://www.adafruit.com/product/4210
1 x Micro SD Card PCB Extender
Short
https://www.adafruit.com/product/4395
1 x Short Headers Kit for Feather
12-pin + 16-pin Female Headers
https://www.adafruit.com/product/2940
1 x Short Feather Male Headers
12-pin and 16-pin Male Header Set
https://www.adafruit.com/product/3002
1 x Panel Mount 1/8" / 3.5mm TRS Audio Jack
Connector
https://www.adafruit.com/product/3692

Optional:

1 x Micro Potentiometer Knob
4 pack, orange
https://www.adafruit.com/product/5533
1 x Micro SD Memory Card
128MB
https://www.adafruit.com/product/5250
1 x 100K Ohm Resistor
5% 1/4W - Pack of 25 - Through Hole

https://www.adafruit.com/product/2787
1 x SPDT Slide Switch
Breadboard-friendly
https://www.adafruit.com/product/805
1 x Hook-up Wire Spool Set
22AWG Stranded-Core - 6 x 25ft
https://www.adafruit.com/product/3111
1 x USB Type A to Type C Cable
Approx. 1 meter / 3 ft long
https://www.adafruit.com/product/4474



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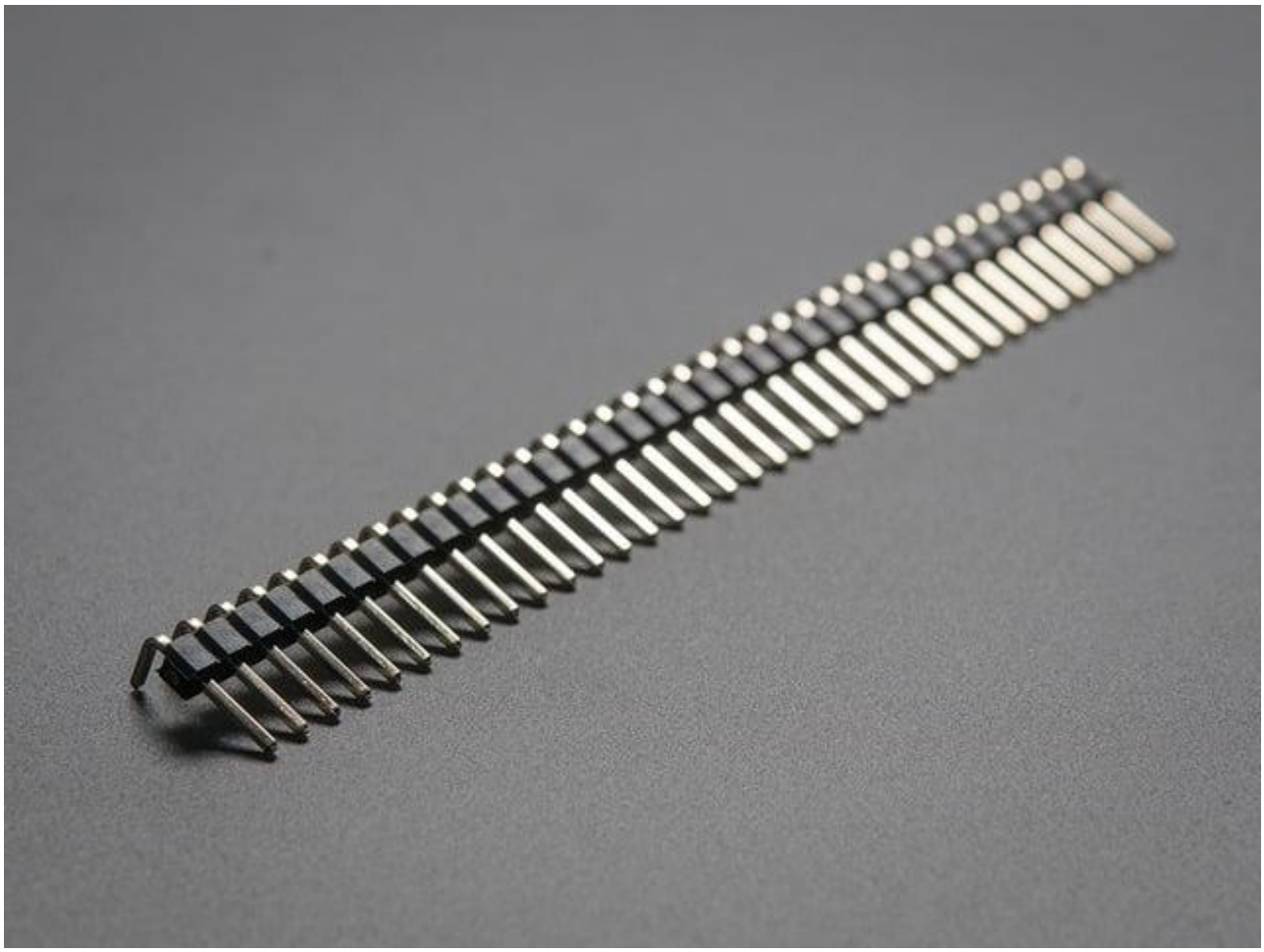
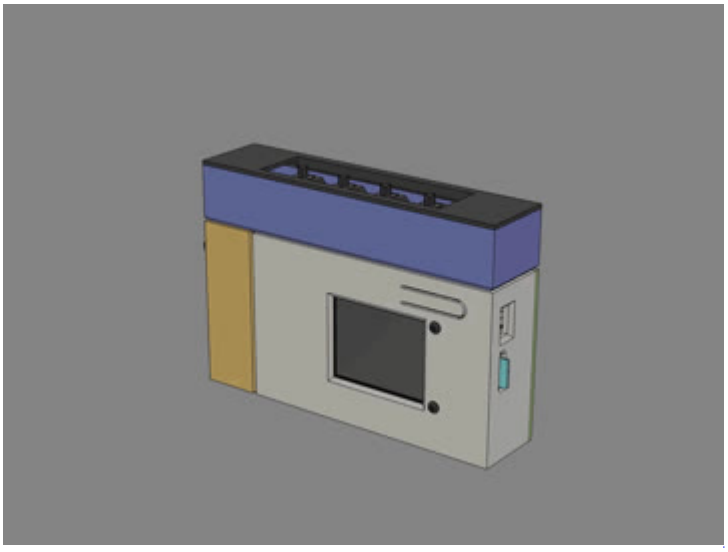


CAD Files

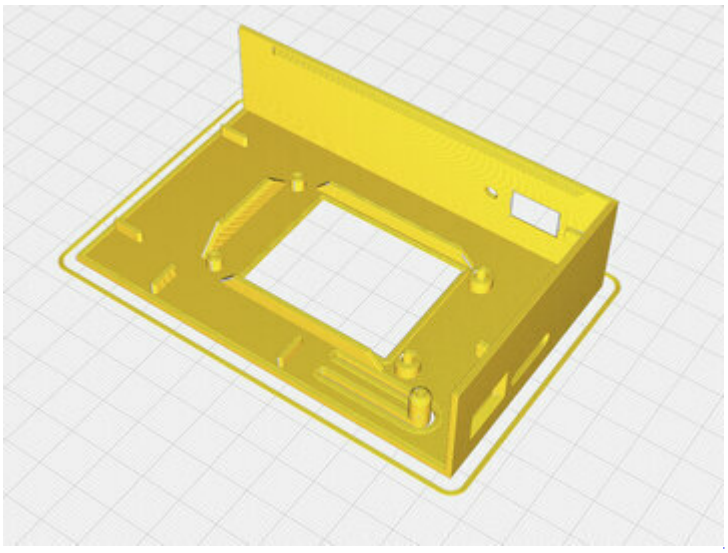
CAD Parts List

- 

STL files for 3D printing are oriented to print "as-is" on FDM style machines. Parts are designed to 3D print without any support material. Original design source may be downloaded using the links below:

  - wp-back-cover
  - wp-button-case
  - wp-button-cover
  - wp-front-case
  - wp-keyswitch-plate
  - wp-switch-holder
  - wp-trs-rotary

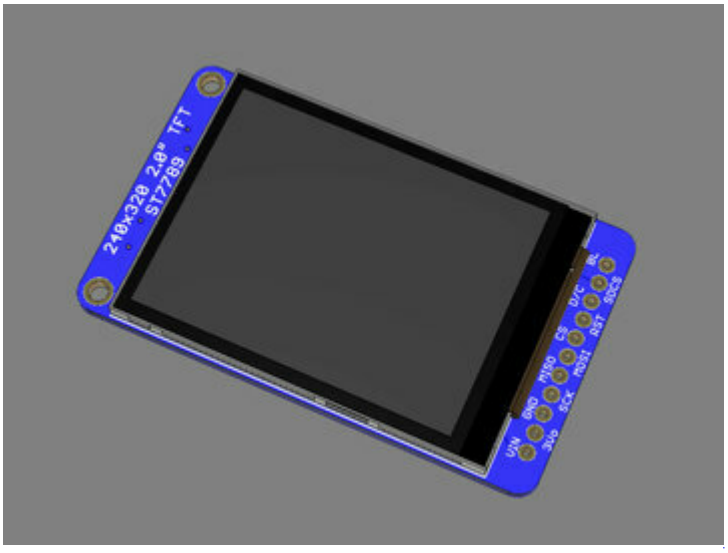
If you don't have access to a 3D printer at home or in a local maker space/ library, you can find services online that will print for you.
STLs.zip
https://adafru.it/114c
Download CAD Source
https://adafru.it/114d

- 

Build Volume

The parts require a 3D printer with a minimum build volume.

  - 110mm (X) x 70mm (Y) x 30mm (Z)

- 

Design Source Files

The project assembly was designed in Fusion 360. This can be downloaded in different formats like STEP, STL and more. Electronic components like Adafruit's boards, displays, connectors and more can be downloaded from the Adafruit CAD parts GitHub Repo (https://adafru.it/AW8).

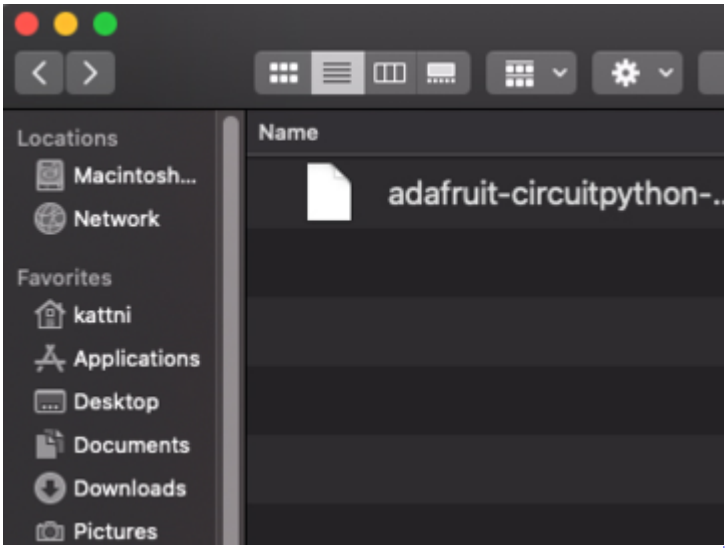
Install CircuitPython

CircuitPython (https://adafru.it/tB7) is a derivative of MicroPython (https://adafru.it/BeZ) designed to simplify experimentation and education on low-cost microcontrollers. It makes it easier than ever to get prototyping by requiring no upfront desktop software downloads. Simply copy and edit files on the **CIRCUITPY** drive to iterate.

CircuitPython Quickstart

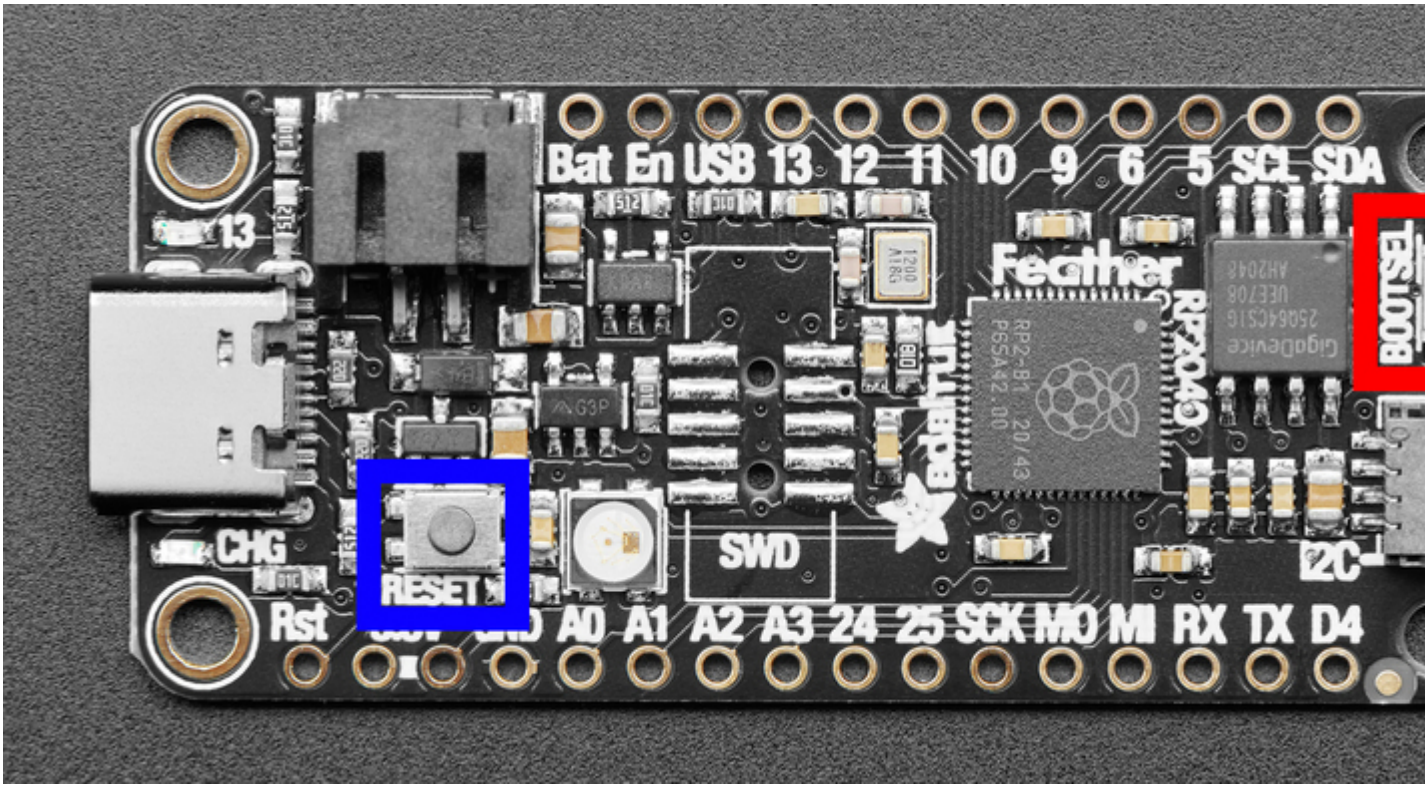
Follow this step-by-step to quickly get CircuitPython running on your board.

Download the latest version of CircuitPython for this board via circuitpython.org
https://adafru.it/R1D

- 

Click the link above to download the latest CircuitPython UF2 file.

Save it wherever is convenient for you.

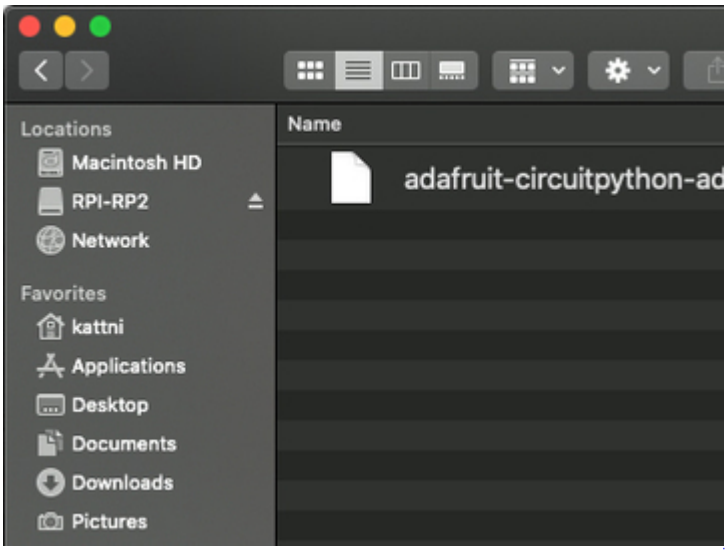


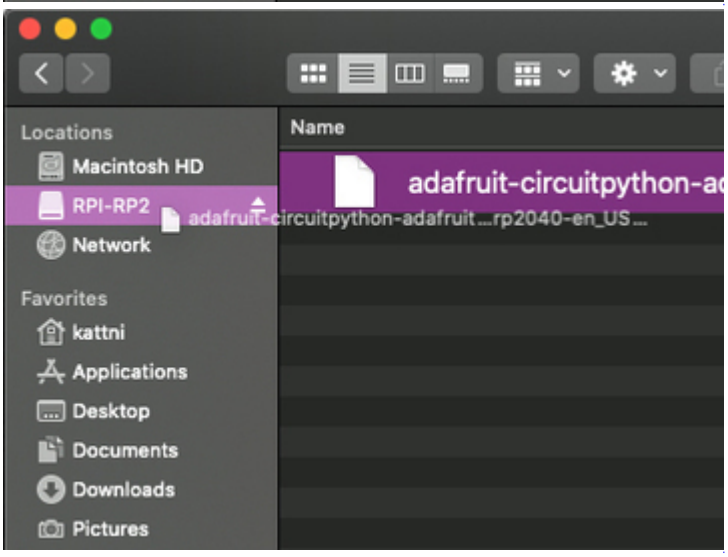
To enter the bootloader, hold down the **BOOT/BOOTSEL button** (highlighted in red above), and while continuing to hold it (don't let go!), press and release the **reset button** (highlighted in blue above). **Continue to hold the BOOT/BOOTSEL button until the RPI-RP2 drive appears!**

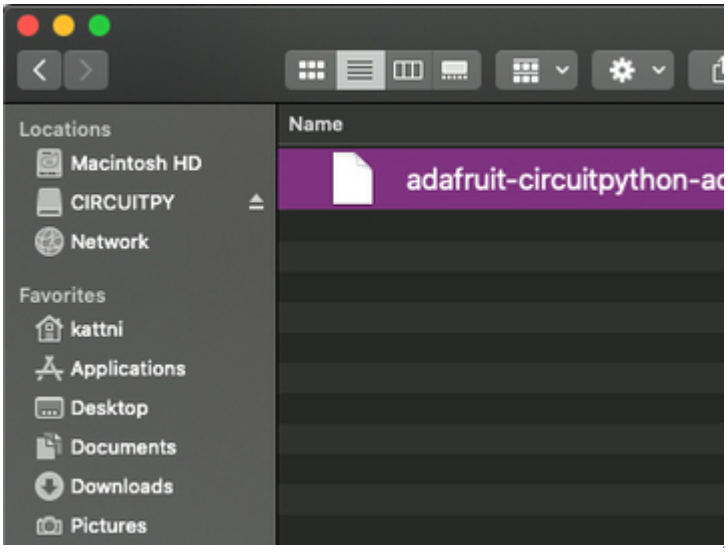
If the drive does not appear, release all the buttons, and then repeat the process above.

You can also start with your board unplugged from USB, press and hold the BOOTSEL button (highlighted in red above), continue to hold it while plugging it into USB, and wait for the drive to appear before releasing the button.

A lot of people end up using charge-only USB cables and it is very frustrating! **Make sure you have a USB cable you know is good for data sync.**

- 

You will see a new disk drive appear called **RPI-RP2**.
- 

Drag the **adafruit_circuitpython_etc.uf2** file to **RPI-RP2.**
- 

The **RPI-RP2** drive will disappear and a new disk drive called **CIRCUITPY** will appear.

That's it, you're done! :)

Safe Mode

You want to edit your **code.py** or modify the files on your **CIRCUITPY** drive, but find that you can't. Perhaps your board has gotten into a state where **CIRCUITPY** is read-only. You may have turned off the **CIRCUITPY** drive altogether. Whatever the reason, safe mode can help.

Safe mode in CircuitPython does not run any user code on startup, and disables auto-reload. This means a few things. First, safe mode bypasses any code in **boot.py** (where you can set **CIRCUITPY** read-only or turn it off completely). Second, it does not run the code in **code.py**. And finally, it does not automatically soft-reload when data is written to the **CIRCUITPY** drive.

Therefore, whatever you may have done to put your board in a non-interactive state, safe mode gives you the opportunity to correct it without losing all of the data on the **CIRCUITPY** drive.

Entering Safe Mode

To enter safe mode when using CircuitPython, plug in your board or hit reset (highlighted in red above). Immediately after the board starts up or resets, it waits 1000ms. On some boards, the onboard status LED (highlighted in green above) will blink yellow during that time. If you press reset during that 1000ms, the board will start up in safe mode. It can be difficult to react to the yellow LED, so you may want to think of it simply as a slow double click of the reset button. (Remember, a fast double click of reset enters the bootloader.)

In Safe Mode

If you successfully enter safe mode on CircuitPython, the LED will intermittently blink yellow three times.

If you connect to the serial console, you'll find the following message.

```
Auto-reload is off.
Running in safe mode! Not running saved code.

CircuitPython is in safe mode because you pressed the reset button during

Press any key to enter the REPL. Use CTRL-D to reload.
```

You can now edit the contents of the **CIRCUITPY** drive. Remember, your code will not run until you press the reset button, or unplug and plug in your board, to get out of safe mode.

Flash Resetting UF2

If your board ever gets into a really weird state and doesn't even show up as a disk drive when installing CircuitPython, try loading this 'nuke' UF2 which will do a 'deep clean' on your Flash Memory. **You will lose all the files on**

the board, but at least you'll be able to revive it! After loading this UF2, follow the steps above to re-install CircuitPython.

Download flash erasing "nuke" UF2
https://adafru.it/RLE

Code the Walkmp3rson

As of CircuitPython 9, a mount point (folder) named /sd is required on the CIRCUITPY drive. Make sure to create that directory after upgrading CircuitPython.
Follow these steps to create the /sd directory
https://adafru.it/19ei

Text Editor

Adafruit recommends using the **Mu** editor for editing your CircuitPython code. You can get more info in this guide (https://adafru.it/ANO).

Alternatively, you can use any text editor that saves simple text files.

Download the Project Bundle

Your project will use a specific set of CircuitPython libraries, sample .mp3s, graphic .bmp, and the **code.py** file. To get everything you need, click on the **Download Project Bundle** link below, and uncompress the .zip file.

Drag the contents of the uncompressed bundle directory onto your board's **CIRCUITPY** drive, replacing any existing files or directories with the same names, and adding any new ones that are necessary.

Audio Files

Copy the .mp3 files from the bundle onto your SD card using a USB SD card reader.

To make your own files, follow the info in this guide (https://adafru.it/113f) on converting audio files to mono .mp3 files.

If you hear clicks and pops, be sure that your .mp3 files are of 128kbit/s or lower bitrate, with sample rates from 8kHz to 24kHz.

```
# SPDX-FileCopyrightText: 2022 John Park and Tod Kurt for Adafruit Industr
# SPDX-License-Identifier: MIT
'''Walkmp3rson digital cassette tape player (ok fine it's just SD cards)''

import time
import os
import board
```

```
import busio
import sdcardio
import storage
import audiomixer
import audiobusio
import audiomp3
from adafruit_neokey.neokey1x4 import NeoKey1x4
from adafruit_seesaw import seesaw, rotaryio
import displayio
import terminalio
from adafruit_display_text import label
from adafruit_st7789 import ST7789
from adafruit_progressbar.progressbar import HorizontalProgressBar
from adafruit_progressbar.verticalprogressbar import VerticalProgressBar


displayio.release_displays()

# SPI for TFT display, and SD Card reader on TFT display
spi = board.SPI()
# display setup
tft_cs = board.D6
tft_dc = board.D9
tft_reset = board.D12
display_bus = displayio.FourWire(spi, command=tft_dc, chip_select=tft_cs,
display = ST7789(display_bus, width=320, height=240, rotation=90)

# SD Card setup
sd_cs = board.D13
sdcard = sdcardio.SDCard(spi, sd_cs)
vfs = storage.VfsFat(sdcard)
storage.mount(vfs, "/sd")

# I2C NeoKey setup
i2c = busio.I2C(board.SCL, board.SDA)
neokey = NeoKey1x4(i2c, addr=0x30)
amber = 0x300800
red = 0x900000
green = 0x009000

neokey.pixels.fill(amber)
keys = [
    (neokey, 0, green),
    (neokey, 1, red),
    (neokey, 2, green),
    (neokey, 3, green),
]
#  states for key presses
key_states = [False, False, False, False]

# STEMMA QT Rotary encoder setup
rotary_seesaw = seesaw.Seesaw(i2c, addr=0x36)  # default address is 0x36
```

```
encoder = rotaryio.IncrementalEncoder(rotary_seesaw)
last_encoder_pos = 0

# file system setup
mp3s = []
for filename in os.listdir('/sd'):
    if filename.lower().endswith('.mp3') and not filename.startswith('.'):
        mp3s.append("/sd/"+filename)

mp3s.sort()  # sort alphanumerically for mixtape  order, e.g., "1_King_of_
for mp3 in mp3s:
    print(mp3)

track_number = 0
mp3_filename = mp3s[track_number]
mp3_bytes = os.stat(mp3_filename)[6]  # size in bytes is position 6
mp3_file = open(mp3_filename, "rb")
mp3stream = audiomp3.MP3Decoder(mp3_file)

def tracktext(full_path_name, position):
    return full_path_name.split('_')[position].split('.')[0]
# LRC is word_select, BCLK is bit_clock, DIN is data_pin.
# Feather RP2040
audio = audiobusio.I2SOut(bit_clock=board.D24, word_select=board.D25, data
# Feather M4
# audio = audiobusio.I2SOut(bit_clock=board.D1, word_select=board.D10, dat
mixer = audiomixer.Mixer(voice_count=1, sample_rate=22050, channel_count=1
                         bits_per_sample=16, samples_signed=True, buffer_s
mixer.voice[0].level = 0.15

# Colors
blue_bright = 0x17afcf
blue_mid = 0x0d6173
blue_dark = 0x041f24

orange_bright = 0xda8c57
orange_mid = 0xa46032
orange_dark = 0x472a16

# display
main_display_group = displayio.Group()  # everything goes in main group
display.root_group = main_display_group  # show main group (clears screen,

# background bitmap w OnDiskBitmap
tape_bitmap = displayio.OnDiskBitmap(open("mp3_tape.bmp", "rb"))
tape_tilegrid = displayio.TileGrid(tape_bitmap, pixel_shader=tape_bitmap.p
main_display_group.append(tape_tilegrid)


# song name label
song_name_text_group = displayio.Group(scale=3, x=90, y=44)  # text label
song_name_text = tracktext(mp3_filename, 2)
```

```
song_name_label = label.Label(terminalio.FONT, text=song_name_text, color=
song_name_text_group.append(song_name_label)  # add the label to the group
main_display_group.append(song_name_text_group)  # add to the parent group

# artist name label
artist_name_text_group = displayio.Group(scale=2, x=92, y=186)
artist_name_text = tracktext(mp3_filename, 1)
artist_name_label = label.Label(terminalio.FONT, text=artist_name_text, co
artist_name_text_group.append(artist_name_label)
main_display_group.append(artist_name_text_group)

# song progress bar
progress_bar = HorizontalProgressBar(
    (72, 144),
    (174, 12),
    bar_color=blue_bright,
    outline_color=blue_mid,
    fill_color=blue_dark,
)
main_display_group.append(progress_bar)

# volume level bar
volume_bar = VerticalProgressBar(
    (304, 40),
    (8, 170),
    bar_color=orange_bright,
    outline_color=orange_mid,
    fill_color=orange_dark,
)
main_display_group.append(volume_bar)
volume_bar.value = mixer.voice[0].level * 100

def change_track(tracknum):
    # pylint: disable=global-statement
    global mp3_filename
    # pylint: disable=global-statement
    global mp3stream
    mp3_filename = mp3s[tracknum]
    song_name_fc = tracktext(mp3_filename, 2)
    artist_name_fc = tracktext(mp3_filename, 1)
    mp3_file_fc = open(mp3_filename, "rb")
    mp3stream.file = mp3_file_fc
    mp3stream_fc = mp3stream
    mp3_bytes_fc = os.stat(mp3_filename)[6]
    return (mp3_file_fc, mp3stream_fc, song_name_fc, artist_name_fc, mp3_b

print("Walkmp3rson")
play_state = False  # so we know if we're auto advancing when mixer finish
last_debug_time = 0  # for timing track position
reels_anim_frame = 0
last_percent_done = 0.01
audio.play(mixer)
```

```
while True:
    encoder_pos = -encoder.position
    if encoder_pos != last_encoder_pos:
        encoder_delta = encoder_pos - last_encoder_pos
        volume_adjust = min(max((mixer.voice[0].level + (encoder_delta*0.0
        mixer.voice[0].level = volume_adjust

        last_encoder_pos = encoder_pos
        volume_bar.value = mixer.voice[0].level * 100

    if play_state is True:  # if not stopped, auto play next song
        if time.monotonic() - last_debug_time > 0.2:  # so we can check tr
            last_debug_time = time.monotonic()
            bytes_played = mp3_file.tell()
            percent_done = (bytes_played / mp3_bytes)
            progress_bar.value = min(max(percent_done * 100, 0), 100)

        if not mixer.playing:
            print("next song")
            audio.pause()
            track_number = ((track_number + 1) % len(mp3s))
            mp3_file, mp3stream, song_name, artist_name, mp3_bytes = chang
            song_name_label.text = song_name
            artist_name_label.text = artist_name
            mixer.voice[0].play(mp3stream, loop=False)
            time.sleep(.1)
            audio.resume()

    # Use the NeoKeys as transport controls
    for k in range(len(keys)):
        neokey, key_number, color = keys[k]
        if neokey[key_number] and not key_states[key_number]:
            key_states[key_number] = True
            neokey.pixels[key_number] = color

            if key_number == 0:  # previous track
                audio.pause()
                track_number = ((track_number - 1) % len(mp3s) )
                mp3_file, mp3stream, song_name, artist_name, mp3_bytes = c
                song_name_label.text = song_name
                artist_name_label.text = artist_name
                mixer.voice[0].play(mp3stream, loop=False)
                play_state = True
                time.sleep(.1)
                audio.resume()

            if key_number == 1:  # Play/pause
                if play_state:
                    audio.pause()
                    play_state = False
                else:
                    audio.resume()
```

```
                play_state = True

        if key_number == 2:  # Play track from beginning
            audio.pause()
            mixer.voice[0].play(mp3stream, loop=False)
            song_name_label.text = tracktext(mp3_filename, 2)
            artist_name_label.text = tracktext(mp3_filename, 1)
            play_state = True
            time.sleep(.1)
            audio.resume()

        if key_number == 3:  # next track
            audio.pause()
            track_number = ((track_number + 1) % len(mp3s))
            mp3_file, mp3stream, song_name, artist_name, mp3_bytes = c
            song_name_label.text = song_name
            artist_name_label.text = artist_name
            mixer.voice[0].play(mp3stream, loop=False)
            play_state = True
            time.sleep(.1)
            audio.resume()

    if not neokey[key_number] and key_states[key_number]:
        neokey.pixels[key_number] = amber
        key_states[key_number] = False
```

How it Works

First, there are a dozen or so libraries to install! These help us use the SD card, TFT display, audio mixer and mp3 decoder, NeoKeys, rotary encoder, and more.

```
import time
import os
import board
import busio
import sdcardio
import storage
import audiomixer
import audiobusio
import audiomp3
from adafruit_neokey.neokey1x4 import NeoKey1x4
from adafruit_seesaw import seesaw, rotaryio
import displayio
import terminalio
from adafruit_display_text import label
from adafruit_st7789 import ST7789
from adafruit_progressbar.progressbar import HorizontalProgressBar
from adafruit_progressbar.verticalprogressbar import VerticalProgressBar
```

Setup

Next, the TFT display is set up on the SPI bus.

```
displayio.release_displays()

# SPI for TFT display, and SD Card reader on TFT display
spi = board.SPI()
# display setup
tft_cs = board.D6
tft_dc = board.D9
tft_reset = board.D12
display_bus = displayio.FourWire(spi, command=tft_dc, chip_select=tft_cs,
display = ST7789(display_bus, width=320, height=240, rotation=90)
```

Then, the SD card reader is set up, also on SPI.

```
# SD Card setup
sd_cs = board.D13
sdcard = sdcardio.SDCard(spi, sd_cs)
vfs = storage.VfsFat(sdcard)
storage.mount(vfs, "/sd")
```

NeoKey

The NeoKey is set up on the I2C bus next, including color definitions and key states.

```
# I2C NeoKey setup
i2c = busio.I2C(board.SCL, board.SDA)
neokey = NeoKey1x4(i2c, addr=0x30)
amber = 0x300800
red = 0x900000
green = 0x009000

neokey.pixels.fill(amber)
keys = [
    (neokey, 0, green),
    (neokey, 1, red),
    (neokey, 2, green),
    (neokey, 3, green),
]
#  states for key presses
key_states = [False, False, False, False]
```

Rotary Encoder

The rotary encoder is set up as a seesaw device.

```
# STEMMA QT Rotary encoder setup
rotary_seesaw = seesaw.Seesaw(i2c, addr=0x36)  # default address is 0x36
```

```
encoder = rotaryio.IncrementalEncoder(rotary_seesaw)
last_encoder_pos = 0
```

SD Card Filesystem

To read the .mp3 files from the SD card, the filesystem is defined and listed.

```
# file system setup
mp3s = []
for filename in os.listdir('/sd'):
    if filename.lower().endswith('.mp3') and not filename.startswith('.'):
        mp3s.append("/sd/"+filename)

mp3s.sort()  # sort alphanumerically for mixtape  order, e.g., "1_King_of_
for mp3 in mp3s:
    print(mp3)

track_number = 0
mp3_filename = mp3s[track_number]
mp3_bytes = os.stat(mp3_filename)[6]  # size in bytes is position 6
mp3_file = open(mp3_filename, "rb")
mp3stream = audiomp3.MP3Decoder(mp3_file)
```

Tracktext Function

This function is used to parse the track names for display, removing the track number from the beginning, and returning the Artist Name and Song Name for display. This is the naming convention:

```
number_artist_song.mp3
```

For example:

03_Bartlebeats_Daisy.mp3

That will be the third song on the "mix tape" SD card, with the artist name **Bartlebeats** and song name **Daisy**.

```
def tracktext(full_path_name, position):
    return full_path_name.split('_')[position].split('.')[0]
```

Audio

The audio is set up as an I2S audio output on the audiobus with pins defined for word select, bit clock, and data.

```
# LRC is word_select, BCLK is bit_clock, DIN is data_pin.
# Feather RP2040
audio = audiobusio.I2SOut(bit_clock=board.D24, word_select=board.D25, data
# Feather M4
# audio = audiobusio.I2SOut(bit_clock=board.D1, word_select=board.D10, dat
```

Mixer

The mixer object is created, with the specific settings we're using for the .mp3 files and an initial volume level.

```
mixer = audiomixer.Mixer(voice_count=1, sample_rate=22050, channel_count=1
                         bits_per_sample=16, samples_signed=True)
mixer.voice[0].level = 0.15
```

Screen Colors

Colors are defined for screen text and graphics.

```
# Colors
blue_bright = 0x17afcf
blue_mid = 0x0d6173
blue_dark = 0x041f24

orange_bright = 0xda8c57
orange_mid = 0xa46032
orange_dark = 0x472a16
```

Displayio

The displayio group and on disk bitmap are defined next.

```
display
main_display_group = displayio.Group()  # everything goes in main group
display.root_group = main_display_group  # show main group (clears screen,

# background bitmap w OnDiskBitmap
tape_bitmap = displayio.OnDiskBitmap(open("mp3_tape.bmp", "rb"))
tape_tilegrid = displayio.TileGrid(tape_bitmap, pixel_shader=tape_bitmap.p
main_display_group.append(tape_tilegrid)
```

Text Labels

The text for song and artist are set up here.

```
# song name label
song_name_text_group = displayio.Group(scale=3, x=90, y=44)  # text label
song_name_text = tracktext(mp3_filename, 2)
song_name_label = label.Label(terminalio.FONT, text=song_name_text, color=
song_name_text_group.append(song_name_label)  # add the label to the group
main_display_group.append(song_name_text_group)  # add to the parent group

# artist name label
artist_name_text_group = displayio.Group(scale=2, x=92, y=186)
artist_name_text = tracktext(mp3_filename, 1)
artist_name_label = label.Label(terminalio.FONT, text=artist_name_text, co
artist_name_text_group.append(artist_name_label)
main_display_group.append(artist_name_text_group)
```

Progress Bars

We're using the horizontal progress bar to visualize song length and a vertical progress bar for volume.

```
# song progress bar
progress_bar = HorizontalProgressBar(
    (72, 144),
    (174, 12),
    bar_color=blue_bright,
    outline_color=blue_mid,
    fill_color=blue_dark,
)
main_display_group.append(progress_bar)

# volume level bar
volume_bar = VerticalProgressBar(
    (304, 40),
    (8, 170),
    bar_color=orange_bright,
    outline_color=orange_mid,
    fill_color=orange_dark,
)
main_display_group.append(volume_bar)
volume_bar.value = mixer.voice[0].level * 100
```

`change_track()` Function

This function is called whenever a track change happens. This can be when the previous or next song buttons are pressed, or when one song ends and the next needs to begin.

```
def change_track(tracknum):

    global mp3_filename
    mp3_filename = mp3s[tracknum]
    song_name_fc = tracktext(mp3_filename, 2)
    artist_name_fc = tracktext(mp3_filename, 1)
    mp3_file_fc = open(mp3_filename, "rb")
    mp3stream_fc = audiomp3.MP3Decoder(mp3_file_fc)
    mp3_bytes_fc = os.stat(mp3_filename)[6]  # size in bytes is position 6
    return (mp3_file_fc, mp3stream_fc, song_name_fc, artist_name_fc, mp3_b
```

States

State variables are set, and then the audio mixer is turned on.

```
play_state = False  # so we know if we're auto advancing when mixer finish
last_debug_time = 0  # for timing track position
last_percent_done = 0.01

audio.play(mixer)
```

Main Loop

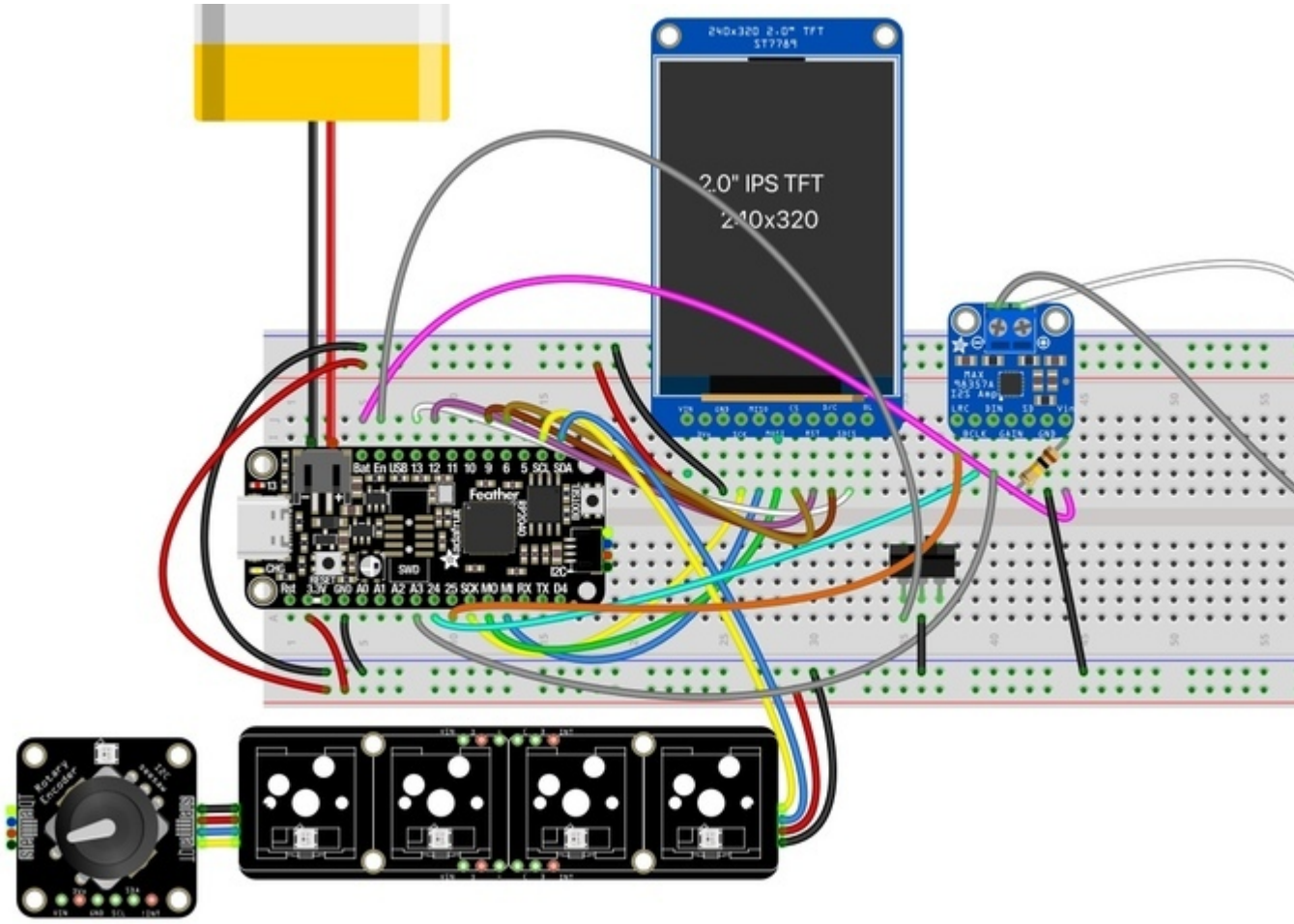
The main loop of the program does the following:

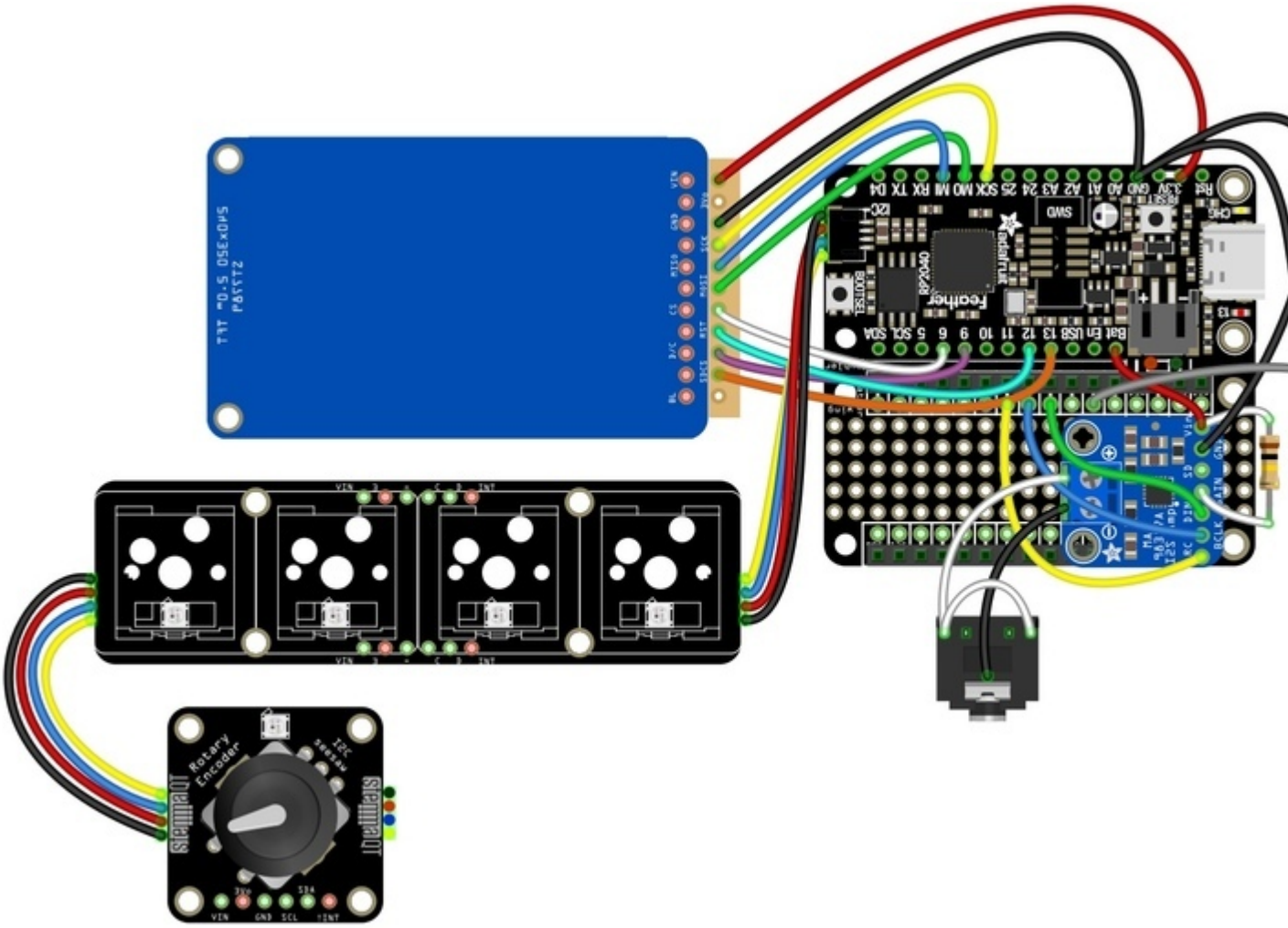
- Checks for encoder input to change volume
- Checks the NeoKeys for input
- Plays the current song until it is paused, finishes, is restarted, or next/ previous buttons are pressed

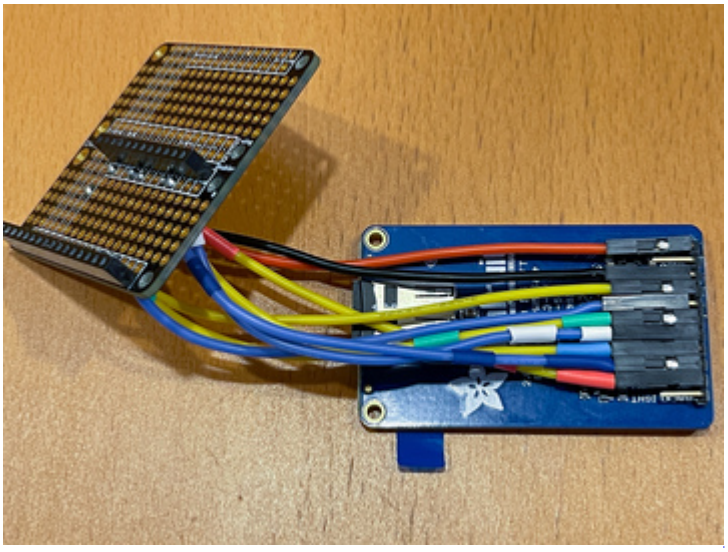
```
while True:
    encoder_pos = -encoder.position
    if encoder_pos != last_encoder_pos:
        encoder_delta = encoder_pos - last_encoder_pos
        volume_adjust = min(max((mixer.voice[0].level + (encoder_delta*0.0
        mixer.voice[0].level = volume_adjust

        last_encoder_pos = encoder_pos
        volume_bar.value = mixer.voice[0].level * 100

    if play_state is True:  # if not stopped, auto play next song
        if time.monotonic() - last_debug_time > 0.2:  # so we can check tr
            last_debug_time = time.monotonic()
            bytes_played = mp3_file.tell()
            percent_done = (bytes_played / mp3_bytes)
            progress_bar.value = min(max(percent_done * 100, 0), 100)

        if not mixer.playing:
            print("next song")
            audio.pause()
            track_number = ((track_number + 1) % len(mp3s))
            mp3_file, mp3stream, song_name, artist_name, mp3_bytes = chang
            song_name_label.text = song_name
            artist_name_label.text = artist_name
            mixer.voice[0].play(mp3stream, loop=False)
            time.sleep(.1)
            audio.resume()

    # Use the NeoKeys as transport controls
    for k in range(len(keys)):
        neokey, key_number, color = keys[k]
        if neokey[key_number] and not key_states[key_number]:
            key_states[key_number] = True
            neokey.pixels[key_number] = color

            if key_number == 0:  # previous track
                audio.pause()
                track_number = ((track_number - 1) % len(mp3s) )
                mp3_file, mp3stream, song_name, artist_name, mp3_bytes = c
                song_name_label.text = song_name
                artist_name_label.text = artist_name
                mixer.voice[0].play(mp3stream, loop=False)
```

```
            play_state = True
            time.sleep(.1)
            audio.resume()

        if key_number == 1:  # Play/pause
            if play_state:
                audio.pause()
                play_state = False
            else:
                audio.resume()
                play_state = True

        if key_number == 2:  # Play track from beginning
            audio.pause()
            mixer.voice[0].play(mp3stream, loop=False)
            song_name_label.text = tracktext(mp3_filename, 2)
            artist_name_label.text = tracktext(mp3_filename, 1)
            play_state = True
            time.sleep(.1)
            audio.resume()

        if key_number == 3:  # next track
            audio.pause()
            track_number = ((track_number + 1) % len(mp3s))
            mp3_file, mp3stream, song_name, artist_name, mp3_bytes = c
            song_name_label.text = song_name
            artist_name_label.text = artist_name
            mixer.voice[0].play(mp3stream, loop=False)
            play_state = True
            time.sleep(.1)
            audio.resume()

    if not neokey[key_number] and key_states[key_number]:
        neokey.pixels[key_number] = amber
        key_states[key_number] = False
```

Build the Walkmp3rson Circuit





- 

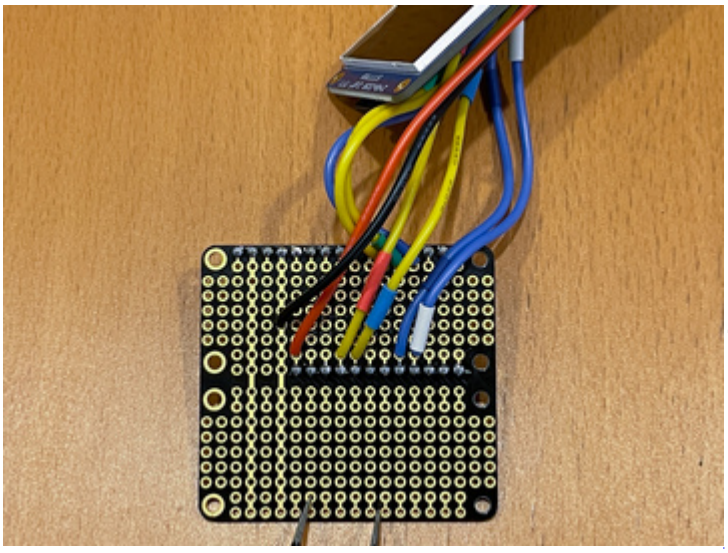
Display Connection

First, solder in the short Feather headers as shown in the picture here. Be sure to use the short headers or the case will not fit!

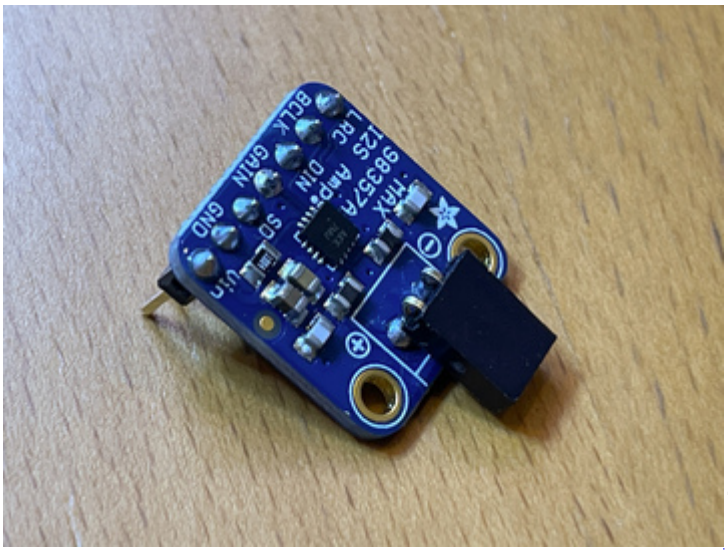
Wire the display as shown in the Fritzing diagram and the photos here to the FeatherWing Doubler.

Note: the photos can be confusing, always double check against the circuit diagram!

There are many ways to do this -- I soldered on

- 

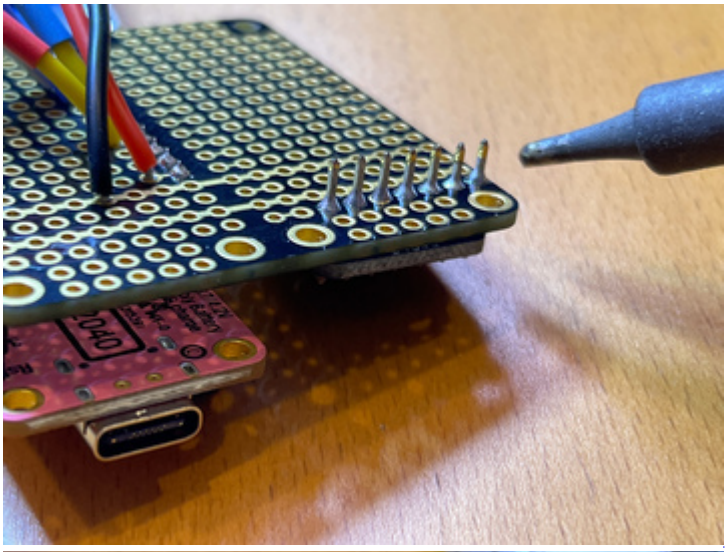
  right angled headers and Dupont connector silicone jumper wires.

- 

Amp Prep

Solder on header pins to the amp board so you can mount it to the Doubler.

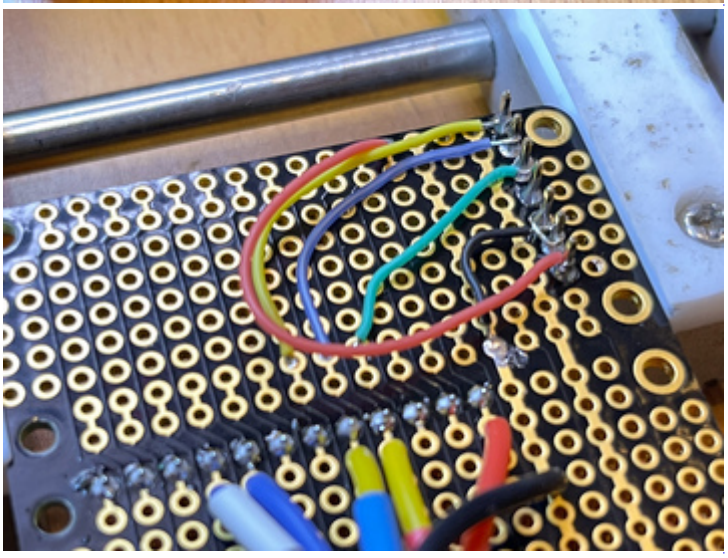
I chose to solder a small socket header to connect the amp breakout to the headphone jack using jumper cables later.

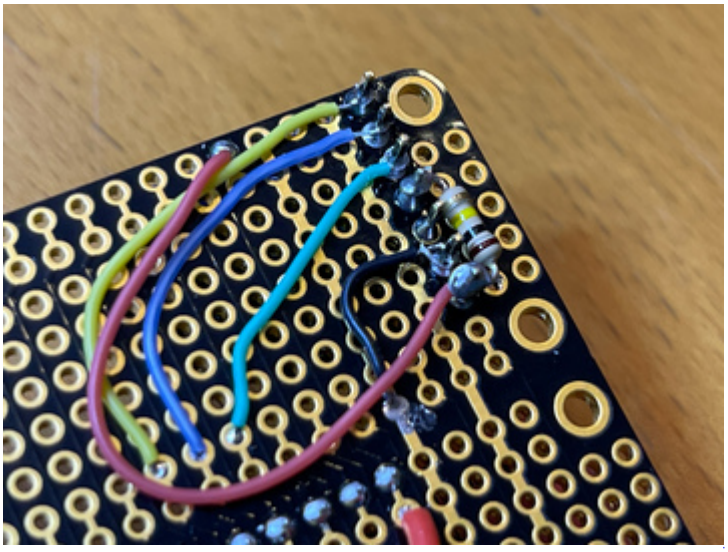
- 

Amp Connections

Solder the amp breakout to the long free row of the doubler as shown.

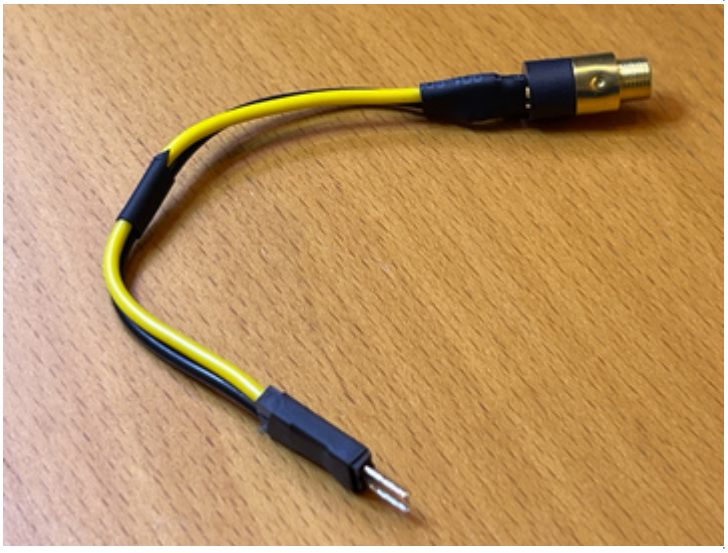
Then, use short wires (such as wire scavenged from an old CAT5 cable or solid core hook up wire with the insulation scraped off at the ends) to connect the legs to their respective pins on the Feather via the Doubler connections.

- 

- 

Amp Gain Resistor

Solder a 100KΩ resistor from the Gain pin to the Vin pin. This sets the amplifier gain to 3dB, which works well for the headphone output.

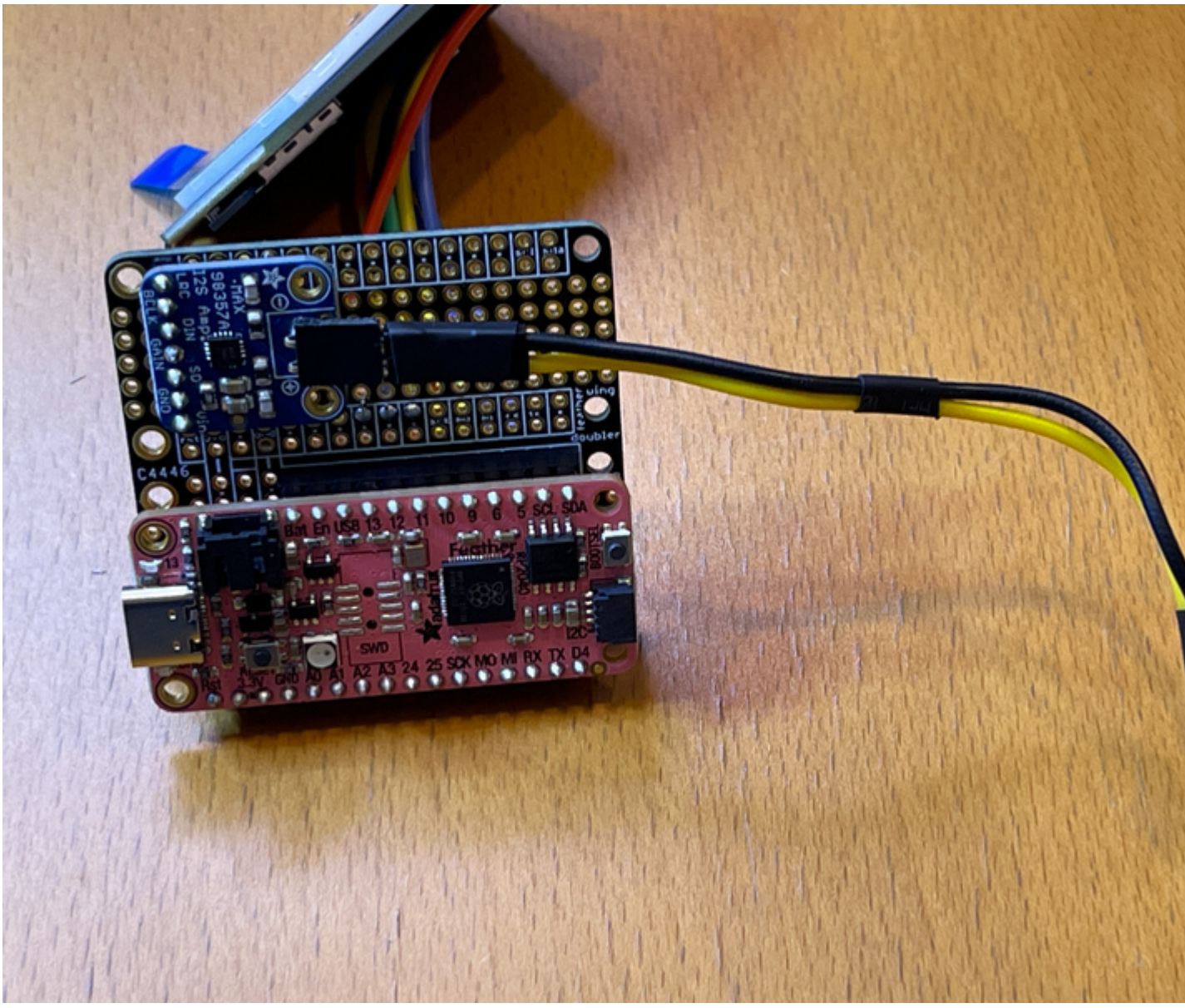
- 
- 

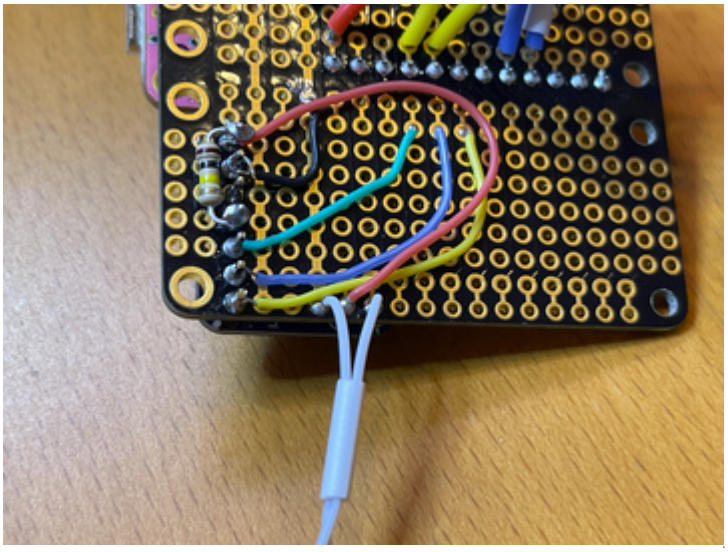
Headphone Out

To keep the project simple we're using a single mono amplifier. Since most headphones have a stereo TRS 3.5mm plug, you'll run the audio signal to both the tip and ring connectors.

Run a single wire to the ground connector.

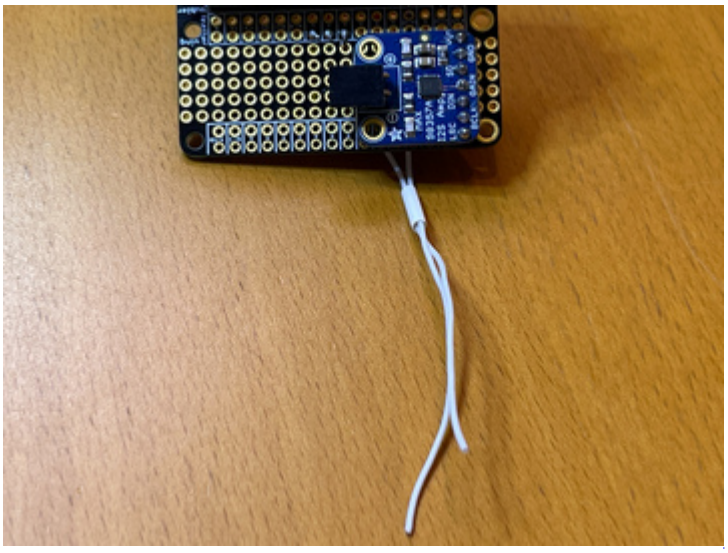
I used Dupont connector cables for this and dressed them with heat shrink tubing.

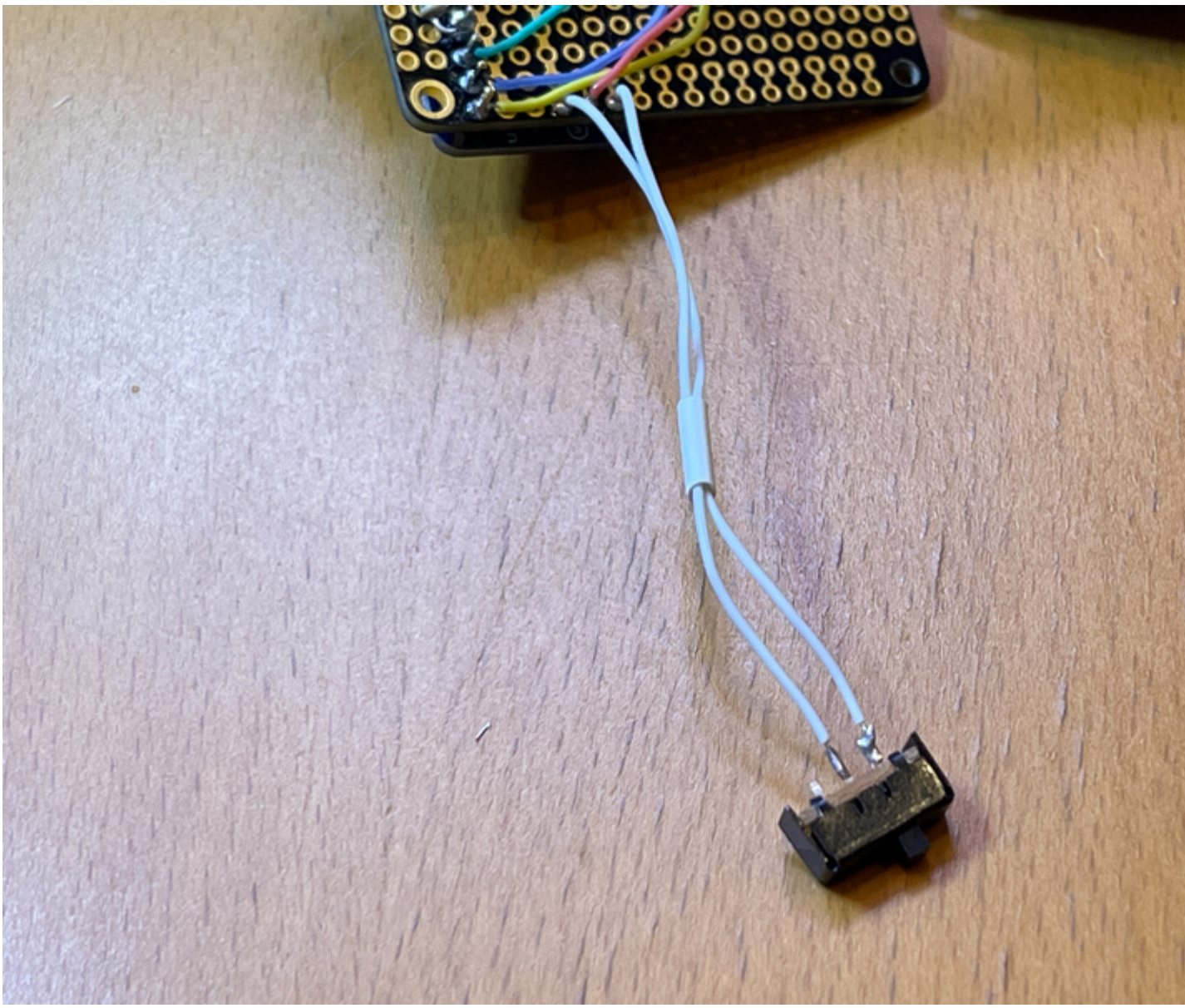


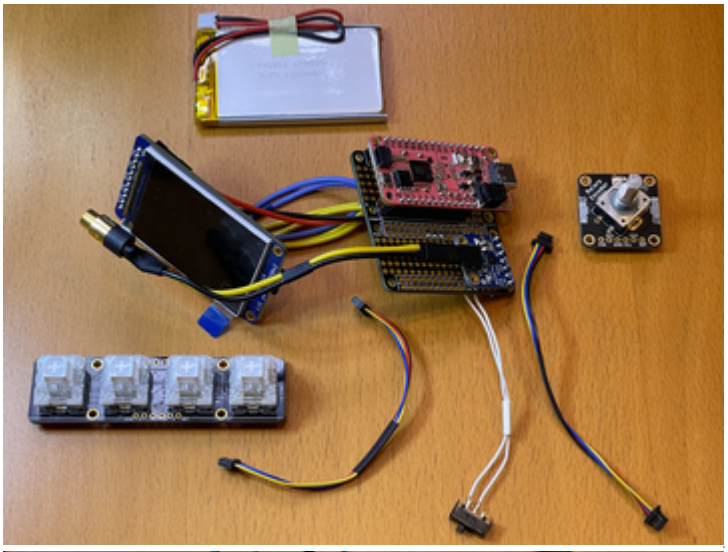
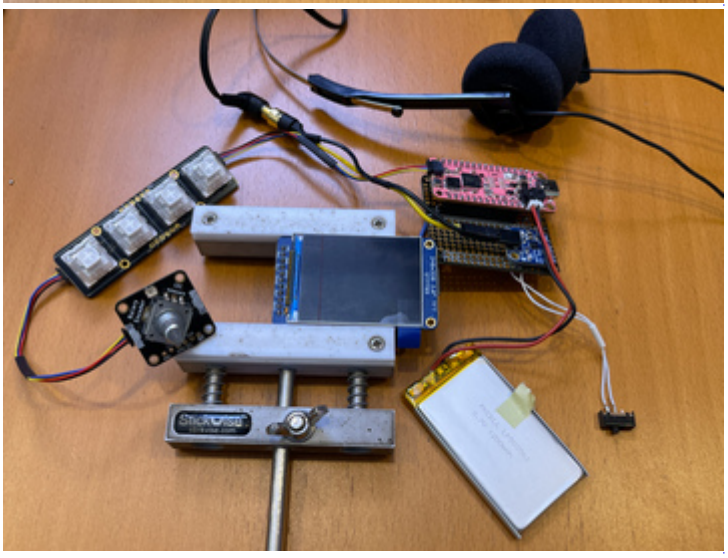
- 

On/Off Switch

Solder a wire from the Doubler/Feather **Enable** pin to one side of a SPDT switch, and another wire from GND to the center position of the switch.

- 

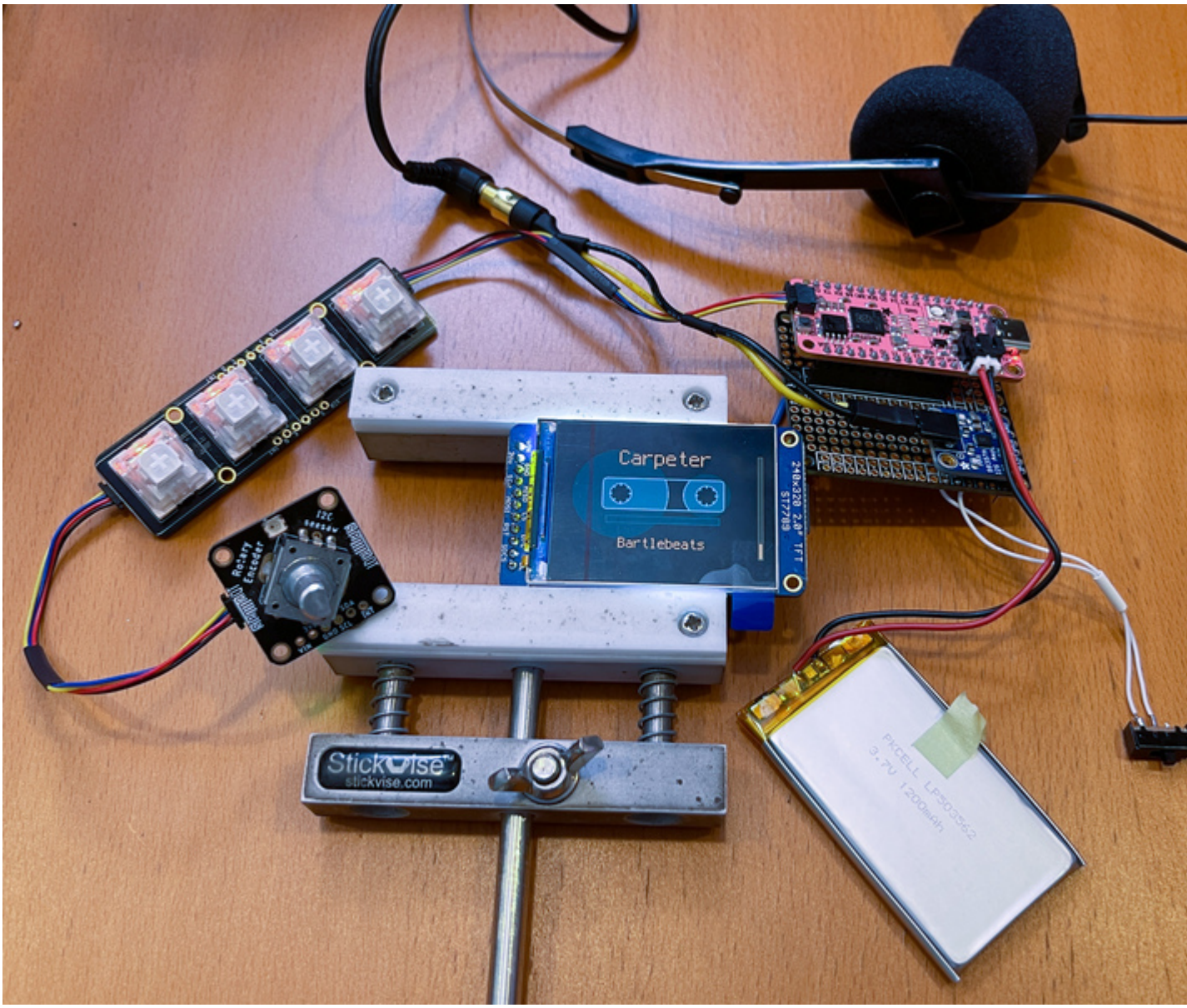


- 
- 

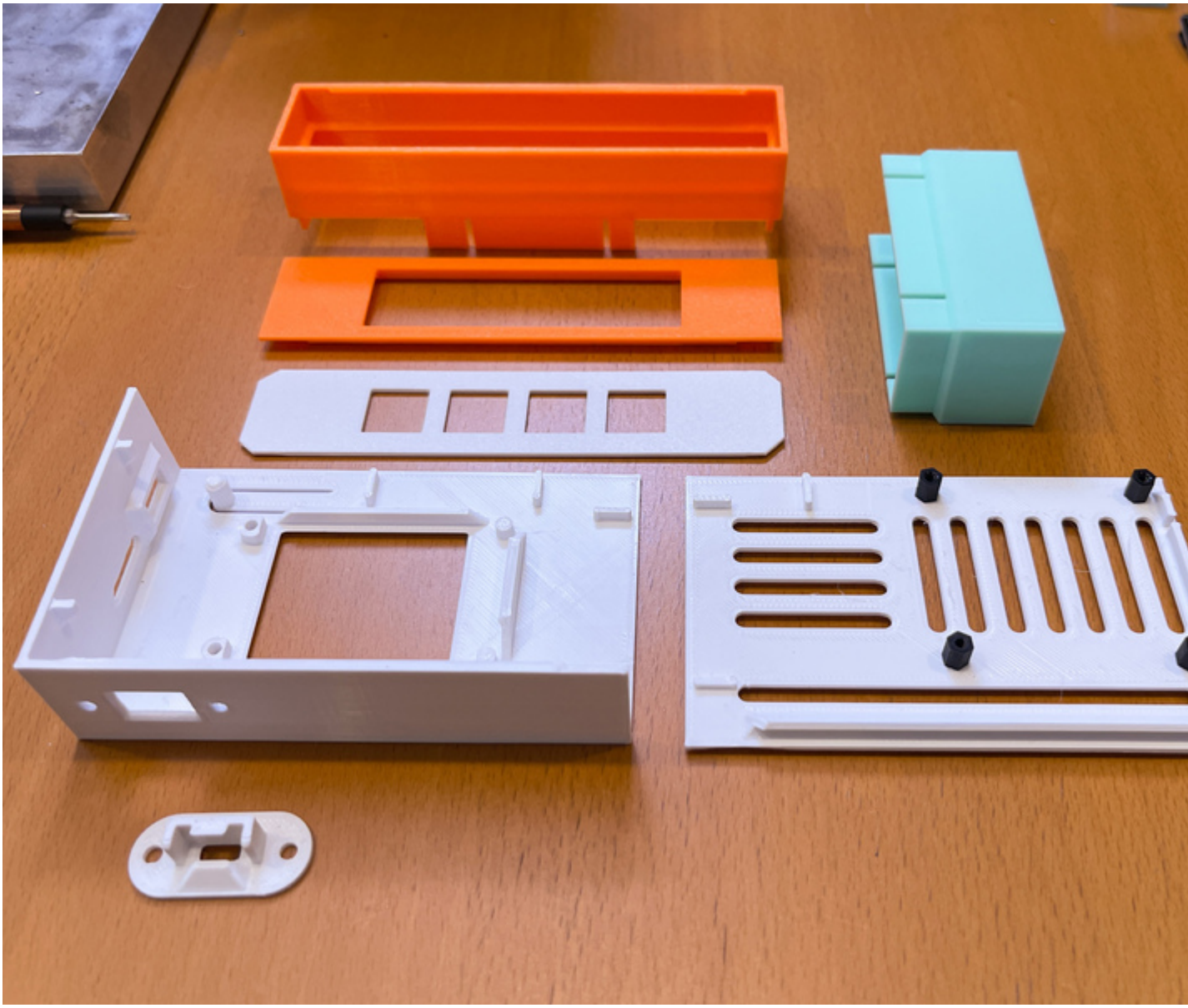
NeoKey 1x4 and QT Rotary Encoder

Use STEMMA QT cables to connect the Feather to the NeoKeys and rotary encoder breakout.

Plug in the battery as well -- since the amp Vin is connected to the Feather's Bat output you'll need the battery connected even when plugged into USB for coding.


Carpeter
Bartlebeats
StickVise
stickvise.com

Assemble the Walkmp3rson



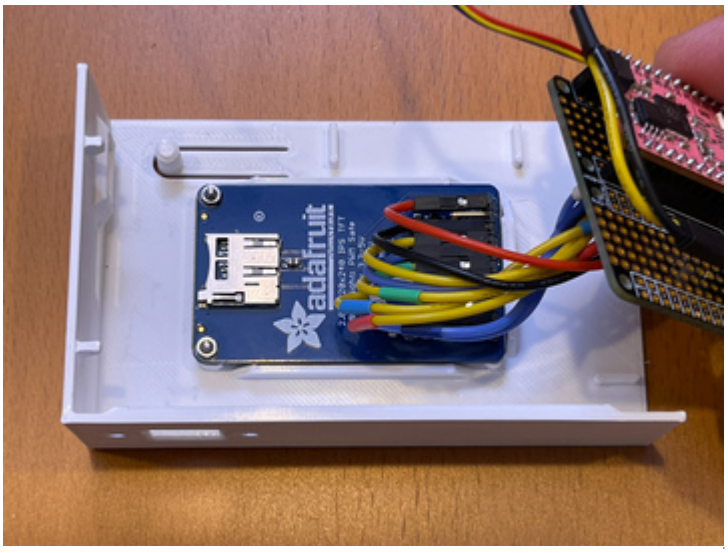
Case Parts

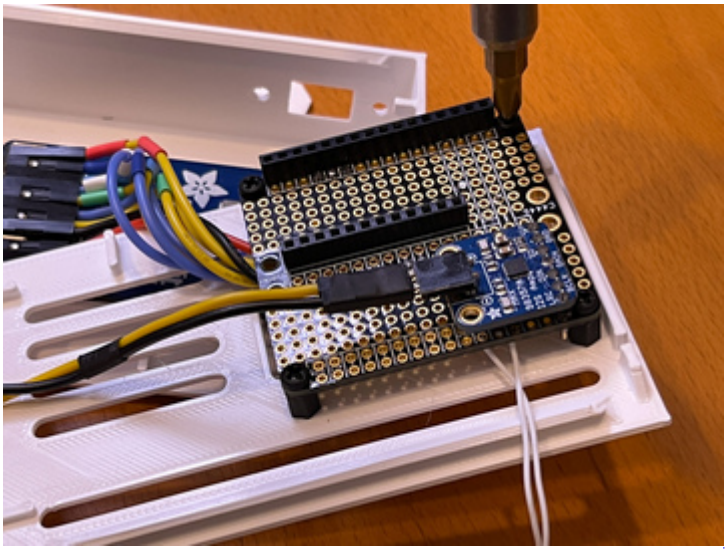
Print the case parts in 80s-tastic colors (or any colors you like). The files and notes for printing can be found on the **CAD Files** page.

Then, screw in the nylon standoffs for the Doubler mounting.

Display Mount

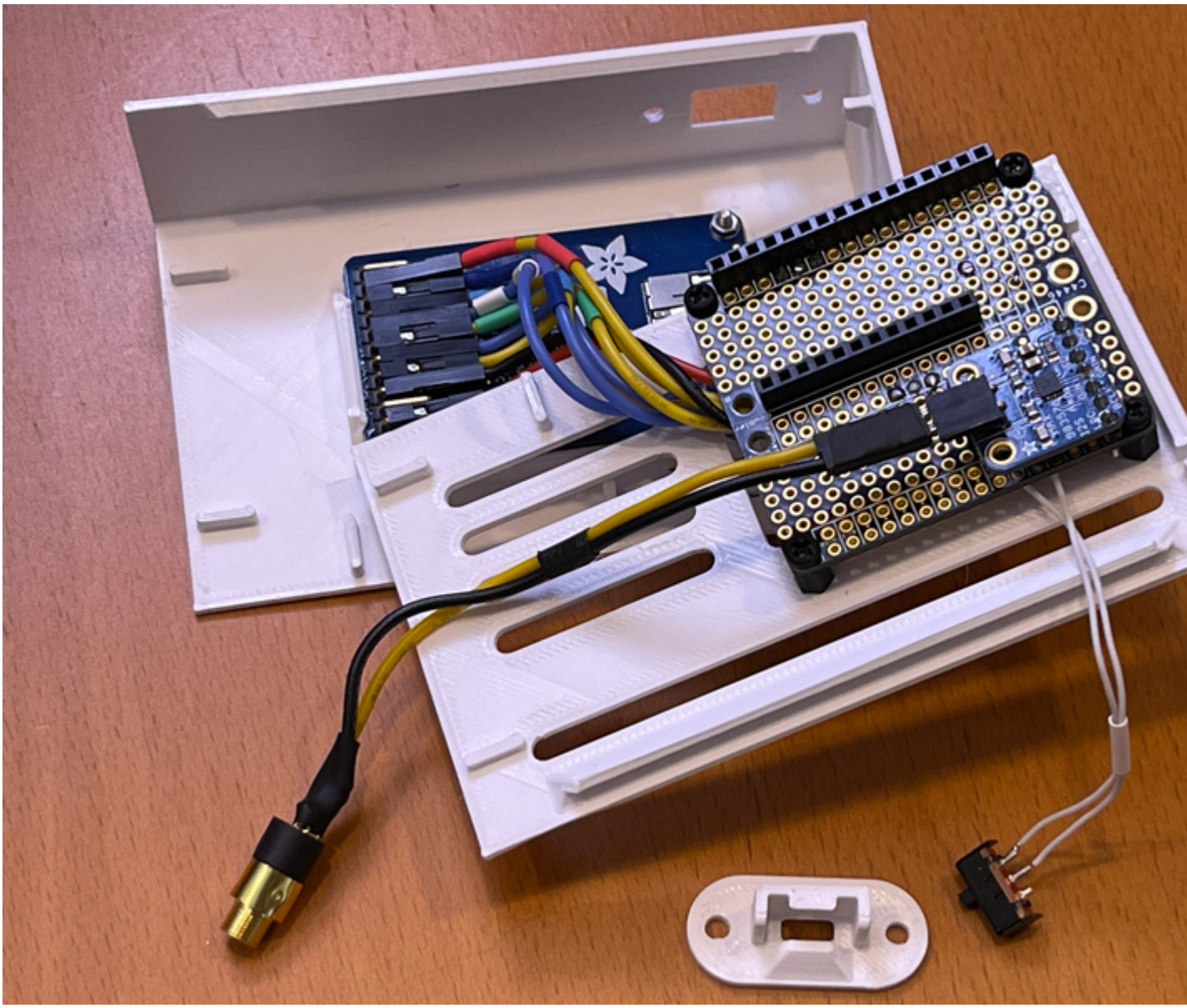
Mount the display as shown, using M2.5 hardware.

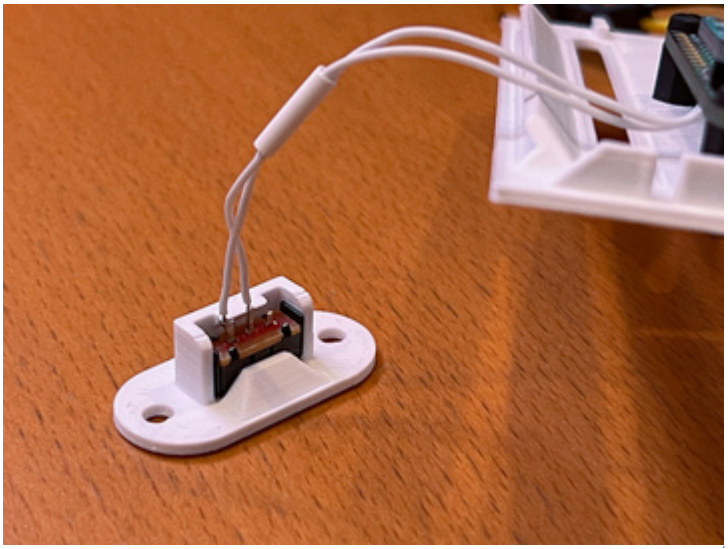
- 

- 

Feather Doubler Mount

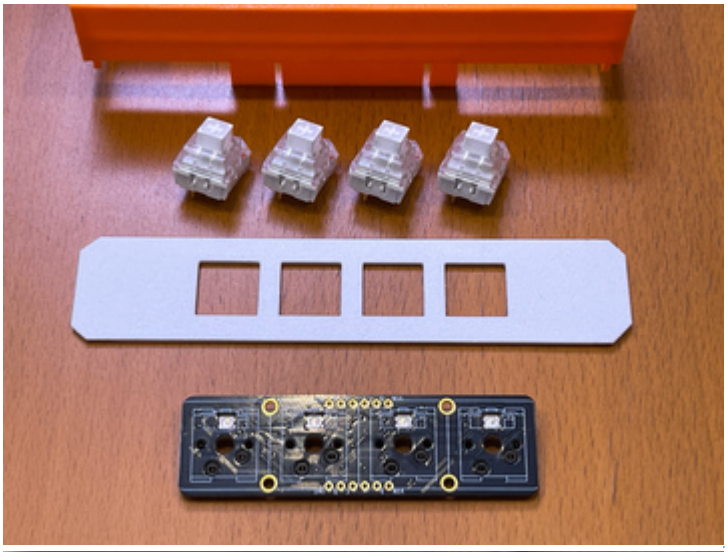
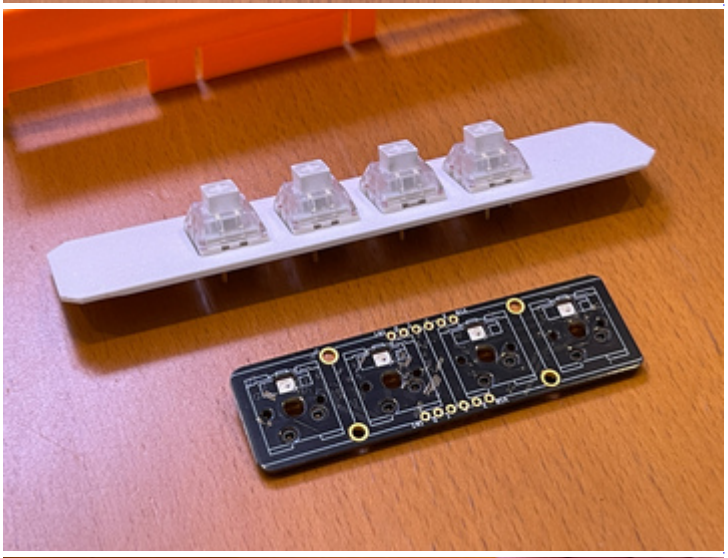
Connect the Doubler to the standoffs as shown.



- 

Switch Mount

Mount the switch into the switch housing thingamajob.

- 
- 

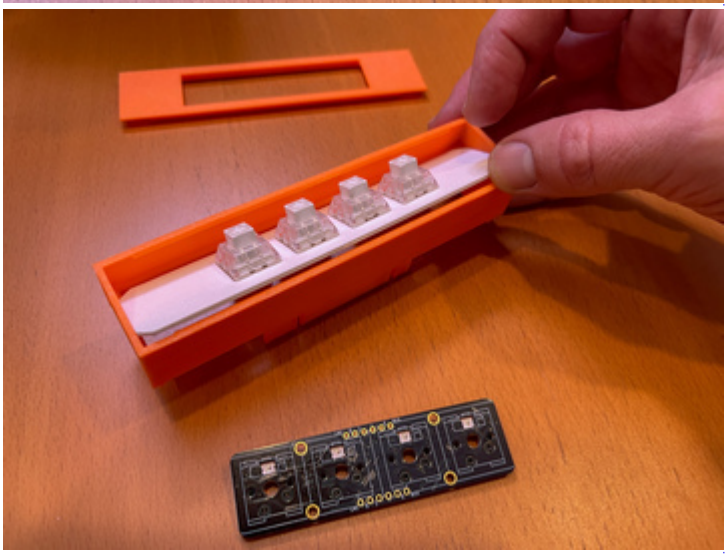
Button Mount

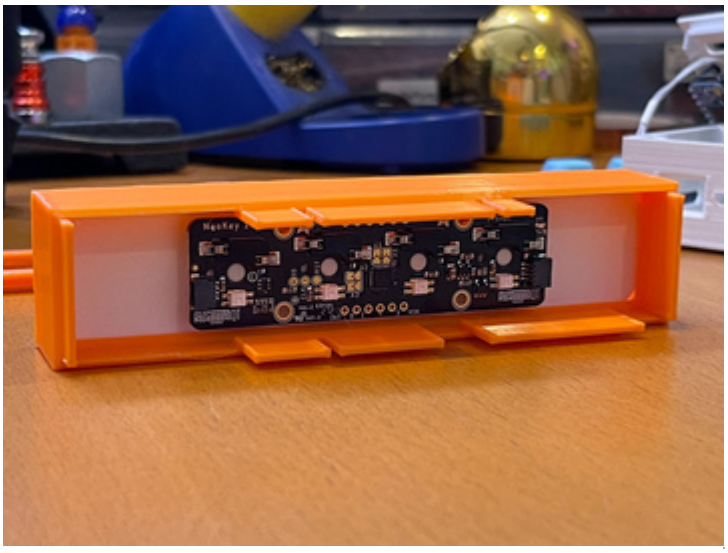
Insert the keyswitches into the mounting plate.

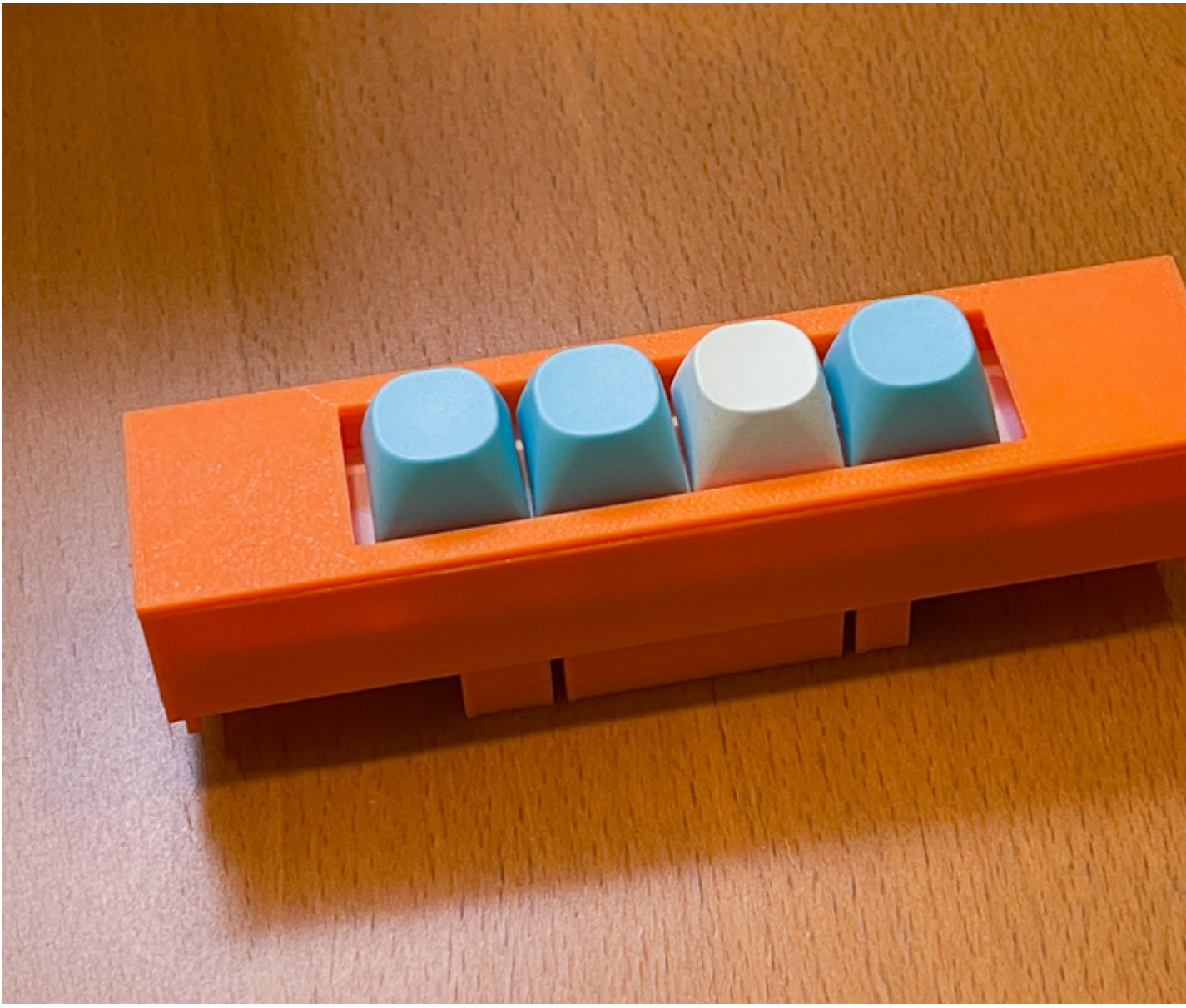
Then, insert the assembly into the case top.

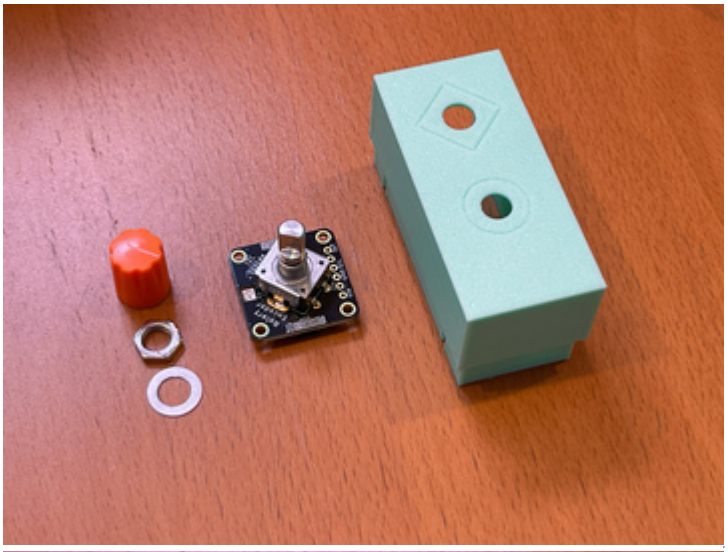
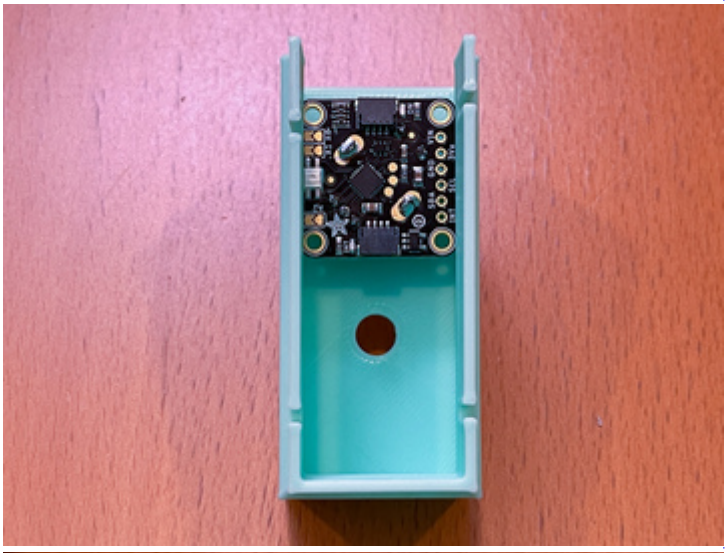
Carefully press the switches into the NeoKey PCB.

Once assembled, add your keycaps.

- 

- 

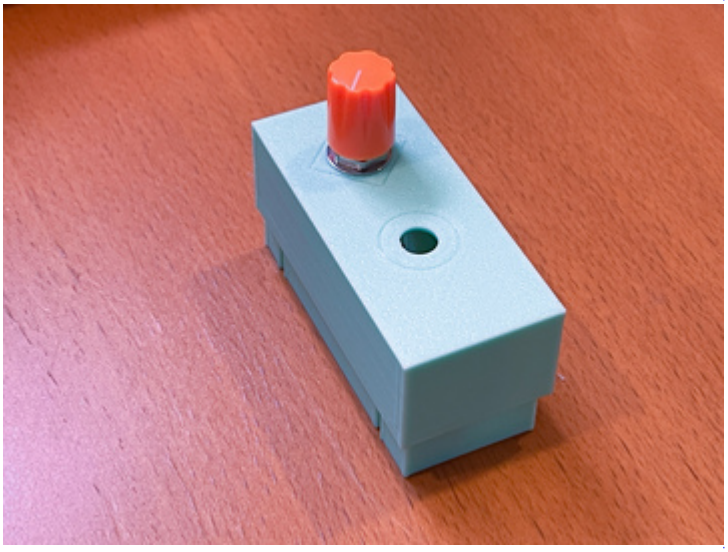


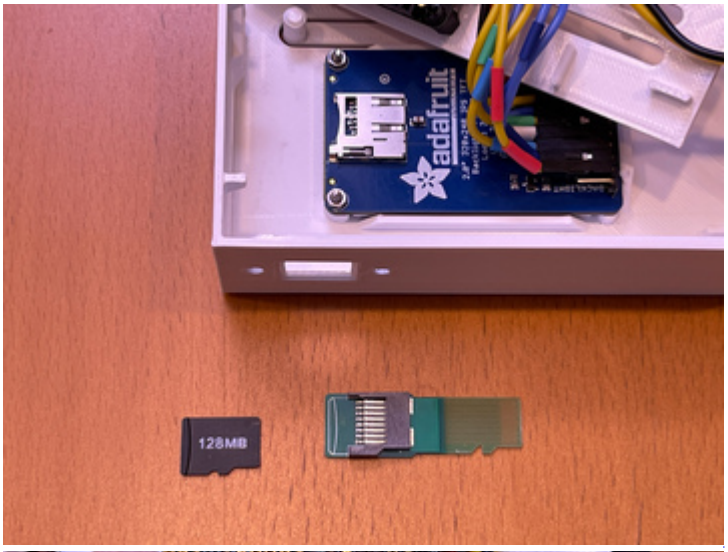
- 
- 

Rotary Mount

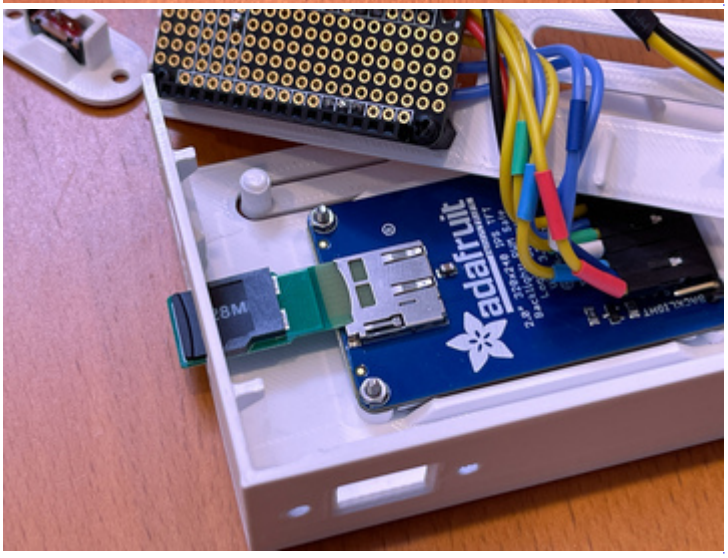
Fit the rotary encoder breakout into the case side, then place the washer over the shaft. Screw on the nut to secure it in place.

Add a knob to the shaft as shown.

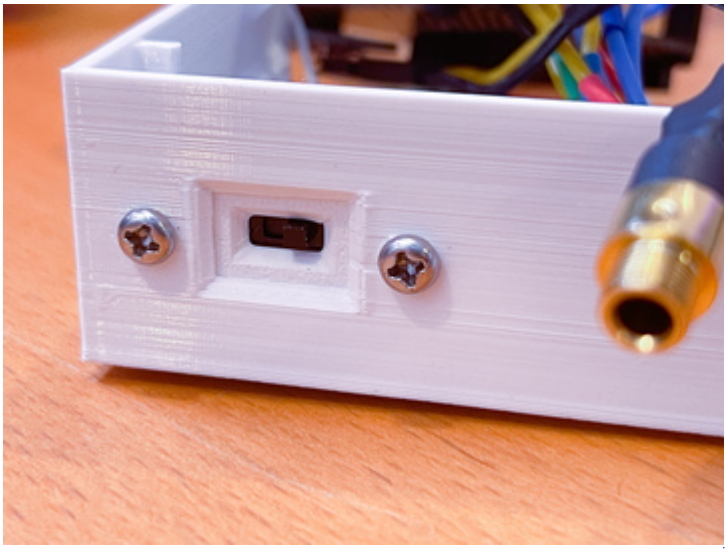
- 

- 

SD Card Extender

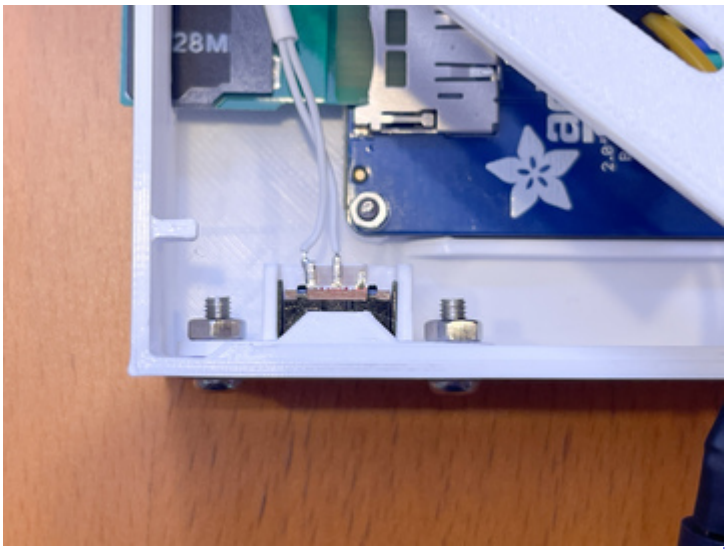
- 

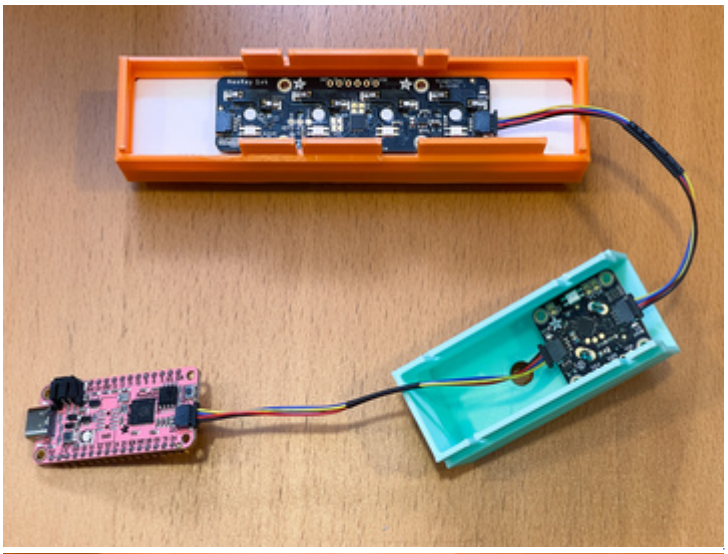
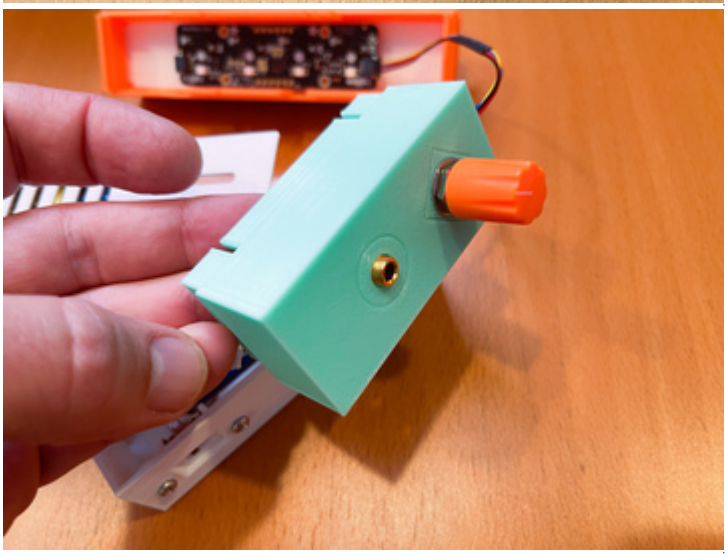
Insert the prepared SD card mix tape into the SD card extender, then insert it all into the display as shown.

- 

On/Off Mount

Use M2.5 hardware to fasten the switch mount to the case as shown.

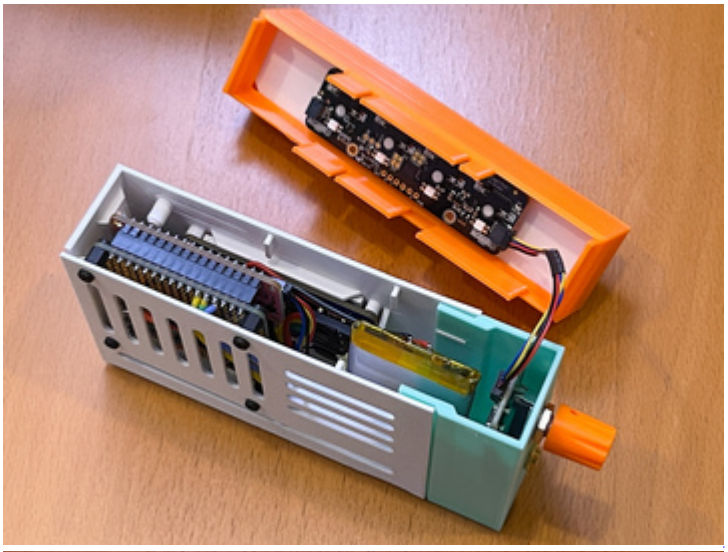
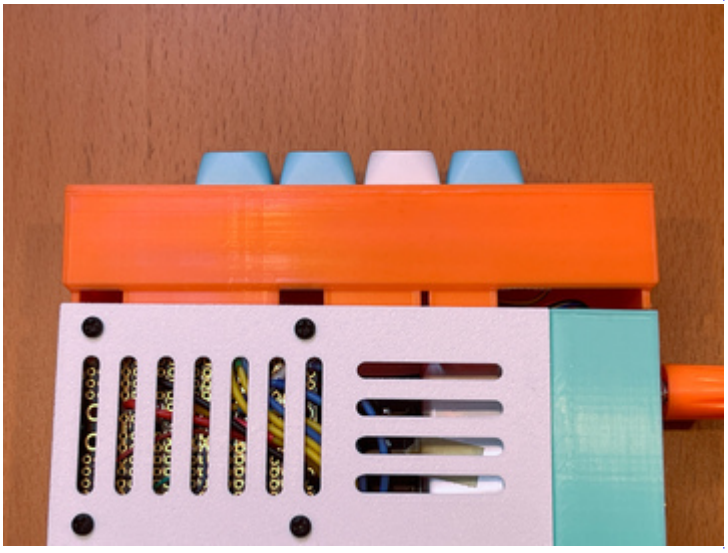
- 

- 
- 

STEMMA QT Connections

Use 100mm STEMMA QT cables to connect the Feather RP2040 to the rotary encoder and NeoKey breakout.

Insert the panel mount headphone jack and screw on the retaining nut.

- 
- 

Final Assembly

Press fit the front and back together and use the side piece to hold them together.

Then, press the top piece into place.


Carpenter