



Program CircuitPython USB Devices with iPhone & iPad

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<https://learn.adafruit.com/use-circuitpython-devices-with-iphone-ipad>

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Overview



With the launch of **iOS & iPadOS 13**, iPhone and iPad now have the ability to **edit code on CircuitPython USB devices**. Users can connect a board such as [Circuit Playground Express](http://adafru.it/3333) to their mobile device and edit & run code on the go.

For this guide, we'll be using a [Circuit Playground Express](http://adafru.it/3333), but the process should work with any of **Adafruit's CircuitPython USB devices** - click [here for a full list](https://adafru.it/FVt).

What you'll need

- An **iPhone** capable of running **iOS 13** or **iPad** capable of running **iPadOS**. Check your device's [compatibility here](https://adafru.it/FVu).

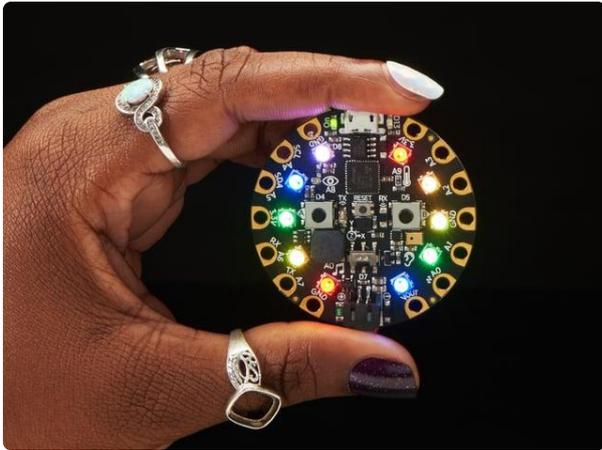
Note that this tutorial is specific to Apple devices. It is hoped that other operating systems on other devices, such as Android, may work in the future.



iOS Lightning to USB OTG Cable

Your iOS phone or tablet may not have a USB port on the bottom but that doesn't mean you can't use it to connect USB devices. Secretly known as a 'Camera Connector' or...

<https://www.adafruit.com/product/3940>



Circuit Playground Express

Circuit Playground Express is the next step towards a perfect introduction to electronics and programming. We've taken the original Circuit Playground Classic and...

<https://www.adafruit.com/product/3333>



USB cable - USB A to Micro-B

This here is your standard A to micro-B USB cable, for USB 1.1 or 2.0. Perfect for connecting a PC to your Metro, Feather, Raspberry Pi or other dev-board or...

<https://www.adafruit.com/product/592>

If you're using an iPad Pro equipped with a **USB-C port**, skip the Lightning Adapter & USB A to Micro-B cable and simply use a **USB-C to Micro-B cable**:



USB C to Micro B Cable - 1 ft 0.3 meter

As technology changes and adapts, so does Adafruit! Rather than the regular USB A, this cable has USB C to Micro B plugs! USB C is the latest...

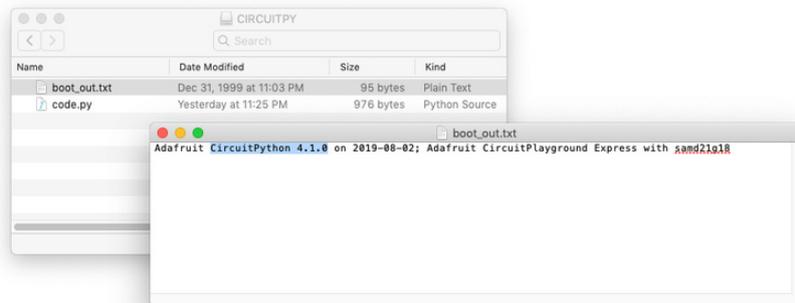
<https://www.adafruit.com/product/3879>

Preparation

First, let's check to make sure your CircuitPython & Apple devices are ready to talk to each other.

Update CircuitPython

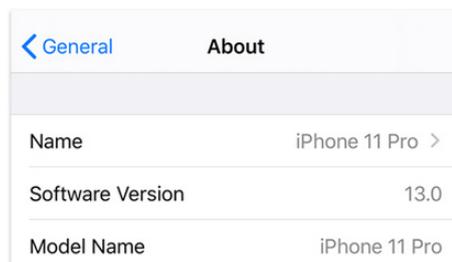
At the time of this writing **iOS & iPadOS** have been tested and confirmed to work with **CircuitPython version 4.1.0**.



Connect your CircuitPython compatible device to your **computer** (not the iOS device), and open the **boot_out.txt** file and check what **version** of CircuitPython you're running.

If you don't see a file named **boot_out.txt** or you have an **older (than 4.1.0)** or **alpha** version of CircuitPython installed, update to the [latest stable release using these instructions \(https://adafru.it/FVv\)](https://adafru.it/FVv).

Update iOS/iPadOS



On your **iPhone/iPad**, check what **version OS** you're running by opening the **Settings** app and tapping **General->About** and checking the **Software Version** number.

If your version number is **13 or later**, you're good to go. If not, update your OS via **Settings->General->Software Update**.

Connect CircuitPython device to iPhone/iPad

For devices with a **Lightning** connector – connect your **Lightning to USB Adapter** to iPhone/iPad and connect your **CircuitPython device** to the adapter via a **micro USB** cable.

For devices with a **USB-C** connector – connect your **CircuitPython device** directly to your **iPad** using a **USB-C to Micro-B** cable.

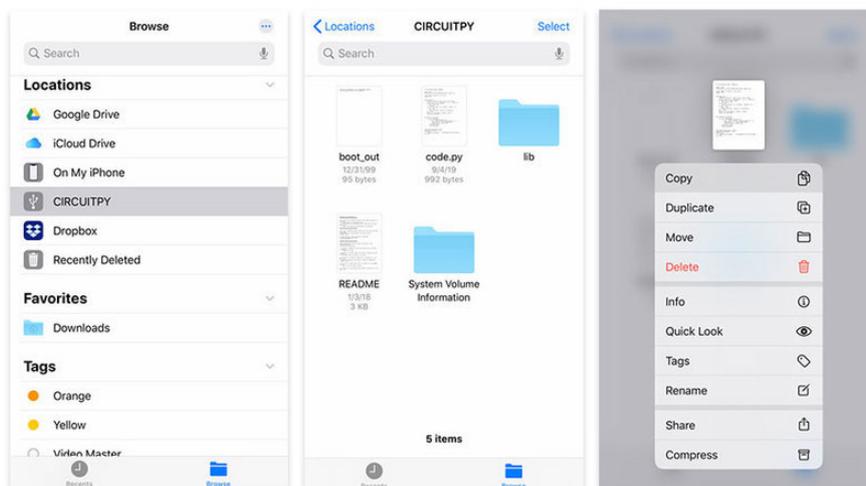
Copy, Edit, Paste

Screenshots below are from iPhone, but the editing process is the same for iPad

Copy code from CIRCUITPY drive

Plug your CircuitPython board, via USB, to your iDevice using the appropriate cable.

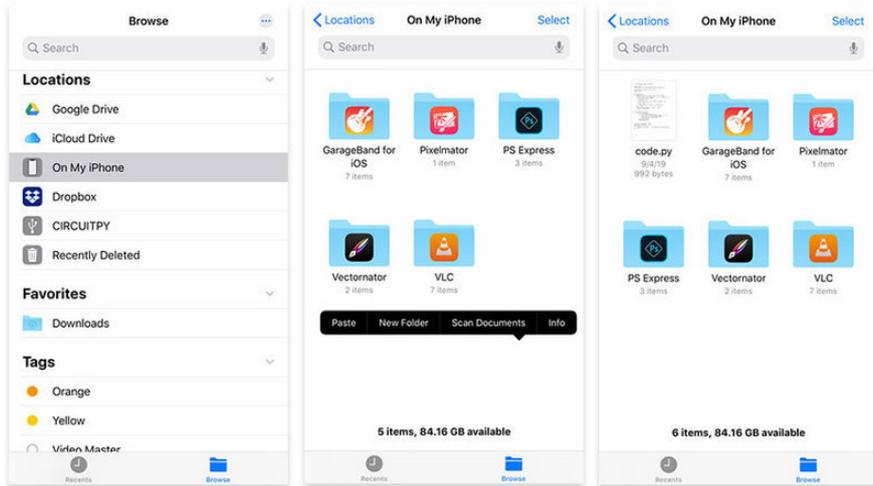
On your iDevice, open the **Files** app, and tap on the drive labelled **CIRCUITPY**. Locate the **code.py** file within. Tap and hold on **code.py** and choose **Copy** from the menu.



Paste code to internal storage

Next in the **Files** app, navigate back and tap **On My iPhone/On My iPad**.

Tap and hold on an empty area, and choose **Paste** from the menu.

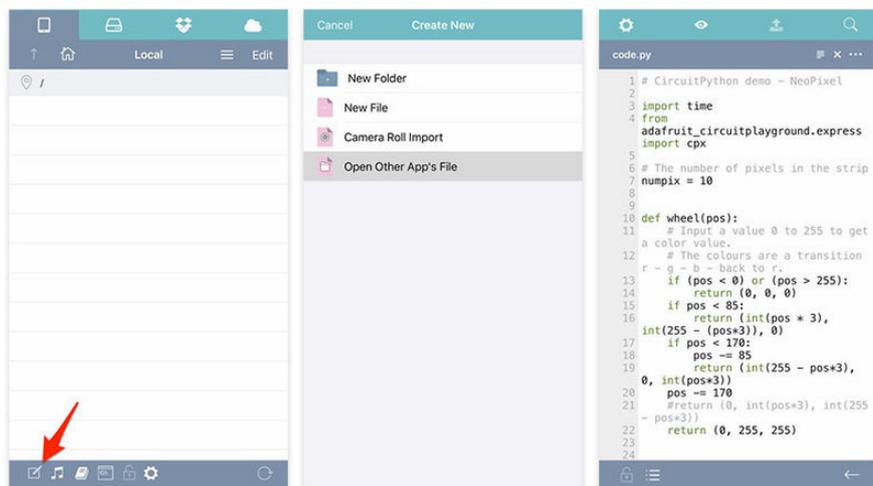


Edit code

Open the **App Store** and search for the free app named [Koder Code Editor](https://adafru.it/FVw) and **download/install** it.

Open **Koder** and tap the **new file** icon in the lower left hand corner, tap **Open Other App's Files**, then open the internal copy of **code.py** stored in **On My iPhone/On My iPad**.

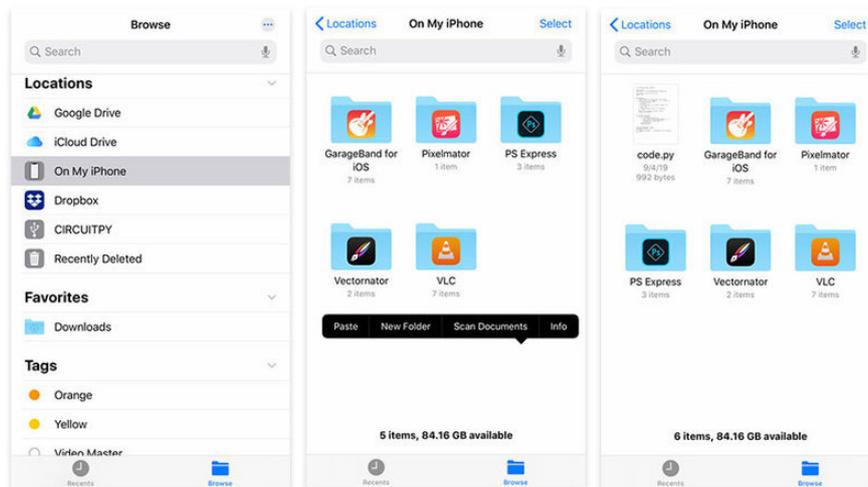
Make changes to your code, then **close** the file – it will be **saved** automatically.



Overwrite original code.py on CIRCUITPY

Return to the **Files** app and navigate to **On My iPhone/On My iPad**. Tap and hold on the edited **code.py** file, and choose **Copy** from the menu.

Navigate to the **CIRCUITPY** drive, **tap and hold** in a blank area, choose **Paste** from the menu, and then choose **Replace** from the popup that appears.



Done

After a few seconds, your **CircuitPython** device should restart and begin **running** your **new code**. That's all there is to it - enjoy the world of mobile embedded development!

Troubleshooting

CircuitPython device restarts intermittently

Your CircuitPython device may periodically restart while being powered by iPhone or iPad – for continuous operation, connect your board to a dedicated power source using the battery port.

Unable to replace/overwrite files on CIRCUITPY drive

Please check to ensure your running the **latest 4.x stable** release of CircuitPython by following [these steps \(https://adafru.it/FVv\)](https://adafru.it/FVv).

If your project **requires** CircuitPython **5.0.0 or later** and you wish to edit your code on iOS/iPadOS follow these steps:

1. Connect your CircuitPython device to your computer
2. Open the CIRCUITPY drive (press **CMD+Shift+period** to view hidden files on macOS)
3. Delete the file named **.Trashes**

You should now be able to delete and replace files on your CircuitPython device from iOS/iPadOS.

CircuitPython 5.0.0 uses a file named `.Trashes` which is hidden by default on macOS. This file prevents macOS from storing deleted files on the CIRCUITPY drive before the system trash is emptied – helping to conserve the limited storage space of CircuitPython devices. Currently, the iOS Files app is incompatible with this technique, and presence of the file prevents deletion of any other file on the CIRCUITPY drive.

CIRCUITPY drive does not mount on iPhone/iPad

Check to ensure your Apple device is running iOS or iPadOS **13** or later. If not, please update your device.

Can I use a USB hub?

Manufacturer designs vary, so we **can't guarantee every hub** will work for connecting to iPhone/iPad to your CircuitPython device. That being said, we didn't have any issues with the USB hubs we tested - so your hub will likely work as well.