







PiAware for Beginners





If you are new to PiAware these instructions lay out the steps to build a PiAware from scratch and assume you know some basic computer navigation.

1. Pick the items to purchase, sometimes you may have items sitting around the house, below are links to suggested places to buy the items.

If you would like to setup a piaware without all the work please purchase a pre-built kit at <https://www.amazon.com/dp/B01EXL7O3M?tag=fligh01-20> for \$145

Required Items			
Image	Item	Where	Cost
	Raspberry Pi Model 3	Amazon	\$45.00
	Power Supply (minimum 5V 2.5 amps)	Amazon	\$9.00
	16 GB micro SD Card	Amazon	\$13.00
	FlightAware Pro Stick	Amazon	\$17.00
	1090MHz Indoor Antenna with SMA connector (You can choose buy a 9 dollar antenna from Amazon instead here)	Ebay	\$5.00
		Total Cost	\$89.00

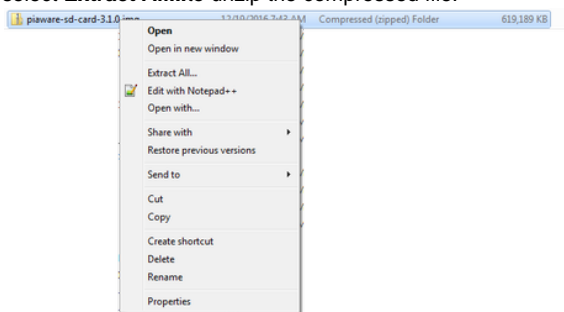
Required Tools			
Image	Item	Where	Cost
	Micro SD Card Reader (If you buy a microSD card with a SD card adapter similar to the one listed above a SD card reader can be used.)	Amazon	\$7.00

Optional Items				
Image	Item	Why	Where	Cost
	Micro SD Card pre-loaded with PiAware	Skip the Programming Step	Amazon	\$16.00
	Raspberry Pi Case	Protects the Pi	Amazon	\$6.00
	Ethernet Cable	If you are not using WiFi	Amazon	\$3.00
	Filter	If you live in an Urban environment this will allow you to see more flights	Amazon	\$20.00

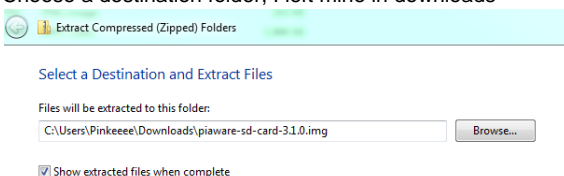
If you plan to use a Raspberry Pi 2 and want to use WiFi please also purchase a WiFi dongle
A list of compatible WiFi dongles can be found here <https://flightaware.com/adsb/faq#wifidongles>

Programming the SD card on Windows 7

- Download [PiAware on Raspbian Linux 3.1.0 ZIP](#) (632MB)
 - Click on the link and it will automatically download in the download folder.
- Select (Left click) on the downloaded **piaware-sd-card-3.1.0.img.zip** file, then right click to open up the menu and select **Extract All...** to unzip the compressed file.



- Choose a destination folder, I left mine in downloads



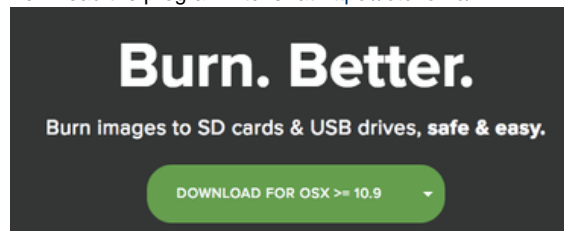
- Download Etcher from <https://etcher.io/>

Programming the SD card on a MAC

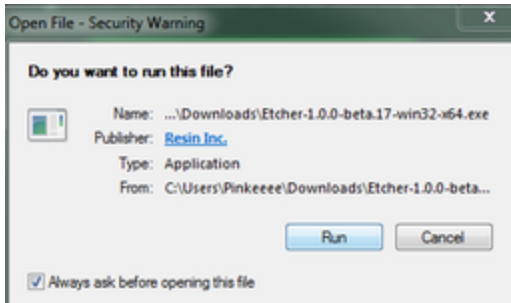
- Download [PiAware on Raspbian Linux 3.1.0 ZIP](#) (632MB) and save the file on your computer.

Leave the file in the Downloads folder
By default the computer will place the file in Downloads you can leave the file in that folder.

- Download the program Etcher at <https://etcher.io/>

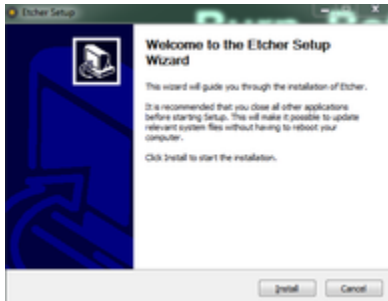


- Open the Etcher download and follow the instructions to install

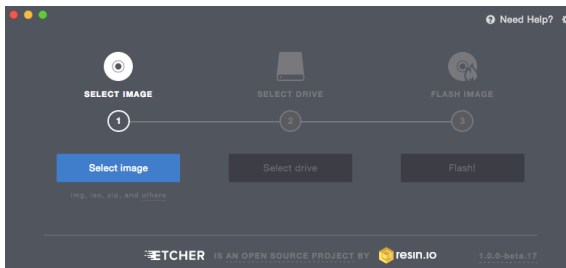


Information on your Windows operating system is located at:
Control Panel\All Control Panel Items\System

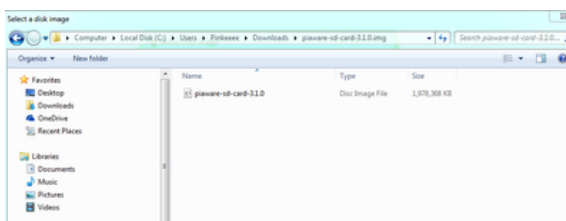
- Follow the directions to install Etcher



- Open the Etcher program



- Select the downloaded **piaware-sd-card-3.1.0.img** file.



Where to find the unzipped file

*If the file is unzipped it might be inside a folder labeled
'piaware-sd-card-3.1.0.img'*

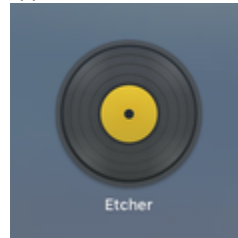
- Select the USB drive (yours might be a different drive)

Computer Drives
IF THE WRONG DRIVE IS USED YOU WILL BREAK YOUR COMPUTER

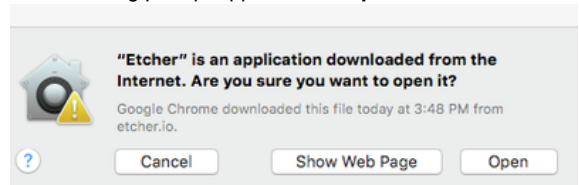
Confirm which drive via 'My Computer'



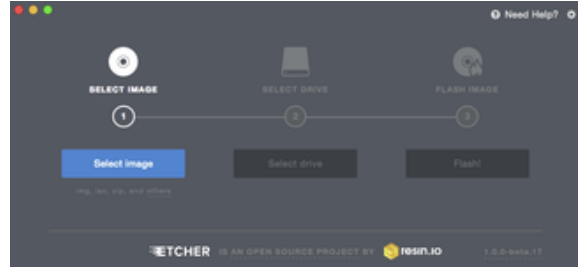
- Close that window and find the Etcher program in your applications



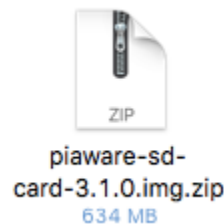
- If this warning prompt appears click **open**



- click **select** to find the piaware image



- Select the downloaded **piaware-sd-card-3.1.0.img** file.



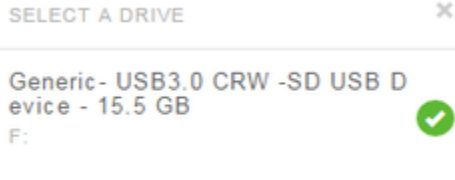
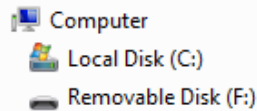
Where to find the unzipped file

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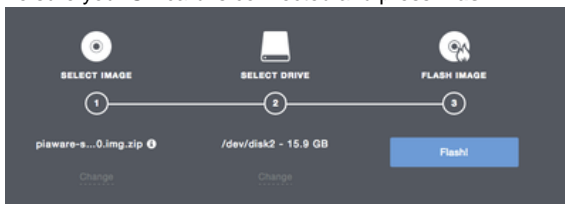
- Select the USB drive

Computer Drives
IF THE WRONG DRIVE IS USED YOU WILL BREAK YOUR COMPUTER

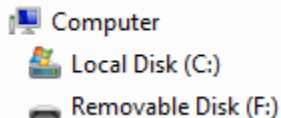
(Below image shows the micro SD card as 'Removable Disk' F: , please be careful of external hard drives or other devices and consider removing them to avoid accidental destruction.)



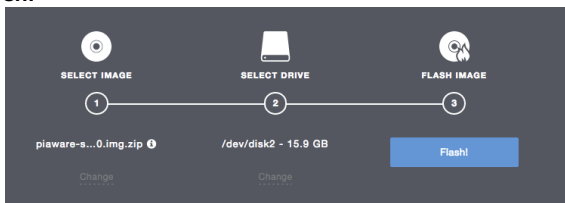
9. Be sure your SD card is connected and press **Flash!**



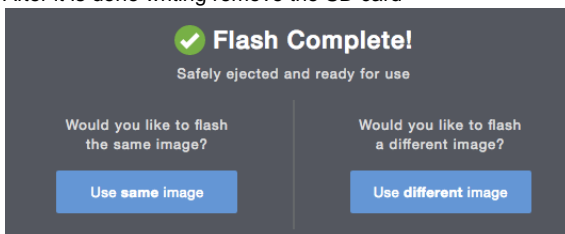
10. You can confirm the drive in **my computer**



11. After you are SURE you are writing to the SD card click **Flash!**



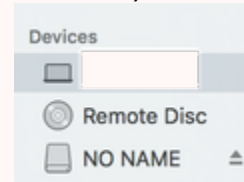
12. After it is done writing remove the SD card



To setup WiFi

Remove the SD card and then place it back in the computer

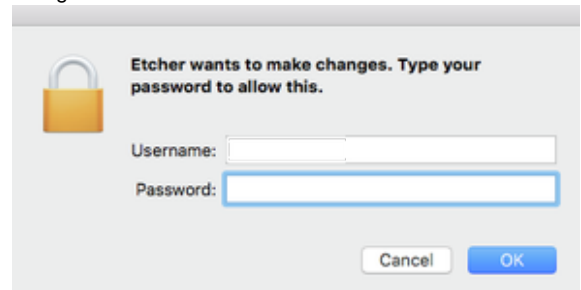
Confirm which drive via 'Finder'
(Below image shows the micro SD card as 'NO NAME' , please be careful of external hard drives or other devices and consider removing them to avoid accidental destruction.)



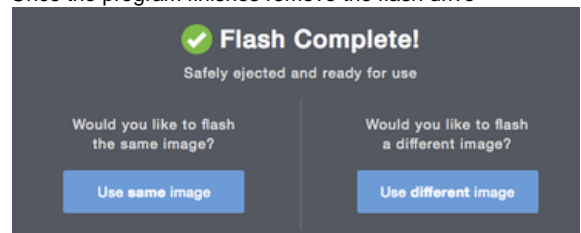
9. Be sure your SD card is connected and press **Flash!**



10. You will need to sign in as an Administrator to make the changes



11. Once the program finishes remove the flash drive



Errors:

1. *If you are presented with a Run Shell Script error, you must move your downloaded **piaware-sd-card-3.1.0.img** file to a folder that has no spaces in the pathname.*
2. *You must also be sure you are selecting your extracted **piaware-sd-card-3.1.0.img** and not the **piaware-sd-card-3.1.0.img.zip**.*

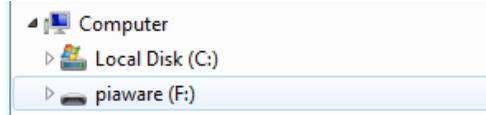
To setup WiFi

Remove the SD card and then place it back in the computer IF you plan on using WiFi

1. Open up the **Finder** program
2. Select the SD device labeled **piaware**

IF you plan on using WiFi

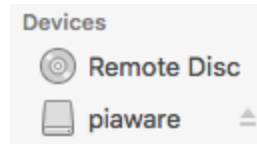
- a. Open up the **Explorer** program
- b. Select the SD card device labeled **piaware**



- c. Open the file labeled **piaware-config.txt**



- d. The file will open in **Notepad**.
- e. Please see the next section on what to change



3. Open the file labeled **piaware-config.txt**



piaware-config.txt

4. The file will open in **TextEdit**.
5. Please see the next section on what to change

Configure WiFi settings (if not using network cable AKA LAN)

Below is the text file you have opened.

Change the words highlighted in **BLUE** below to enable WiFi on PiAware.
Hints are highlighted below in **Orange**

```
#
# This file configures the Piaware sdcard image
# configuration. Whenever the system boots, this
# file is read and its contents are used to
# configure the system.
#
# Lines beginning with a '#' are comment lines
# and are ignored. Blank lines are also ignored.
# All other lines specify configuration settings.
#

#
# WIRED NETWORK CONFIGURATION
#

# Should piaware use the wired ethernet port
# for network access?
wired-network yes

# Wired network configuration:
# Most networks will use DHCP
wired-type dhcp

# Alternatively, a static address configuration
# can be provided; set "wired-type" to static to use this.
wired-address 192.168.1.10
wired-netmask 255.255.255.0
wired-broadcast 192.168.1.255
wired-gateway 192.168.1.254
wired-nameservers 8.8.8.8 8.8.4.4

#
# WIRELESS NETWORK CONFIGURATION
#
```

**# Should piaware use a wifi adaptor
for network access? You will need to attach
a supported USB wifi adaptor for this to work.**

change this to "yes" to enable wifi
wireless-network no <----Change this to "yes"

Wifi SSID and password.

**# This should be changed to match your wireless
network SSID and, for networks that require
a passphrase, the passphrase.**

wireless-ssid MyWifiNetwork <-----replace MyWifiNetwork with the name of your WiFi (aka the SSID of your local network)

wireless-password s3cr3t <-----replace s3cr3t with the password to your WiFi

Wifi network configuration:

Most networks will use DHCP

wireless-type dhcp

Alternatively, a static address configuration

can be provided; set "wireless-type" to static to use this.

wireless-address 192.168.1.10

wireless-netmask 255.255.255.0

wireless-broadcast 192.168.1.255

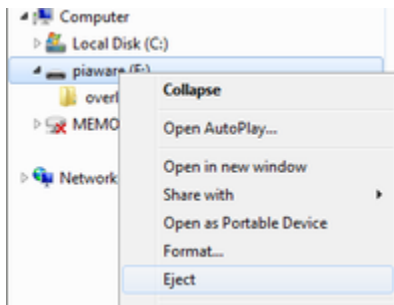
wireless-gateway 192.168.1.254

wireless-nameservers 8.8.8.8 8.8.4.4

Hit "Save" and then close the program.

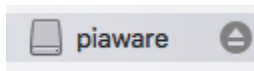
Please eject the SD card BEFORE removing from your computer

Windows:



MAC:

In Finder press the 'eject' symbol beside drive name (piaware)



Put the Feeder together

1. Put the micro SD card into the Raspberry Pi slot



2. Connect the USB dongle to the Raspberry Pi



3. Connect the Antenna to the USB dongle



4. Place the Antenna in a location that gives it a clear view of the sky to receive the radio waves



If not using WiFi

If you are not using wifi don't forget to connect the ethernet (AKA network) cable.

5. Connect the power supply



You should observe a solid red LED and a blinking green LED on the Raspberry Pi as well as yellow and green LEDs next to the Ethernet jack.

Claim your piaware

1. Go to this link: <https://flightaware.com/adsb/piaware/claim>
2. If this appears: **"Unfortunately, FlightAware hasn't found a new, unclaimed PiAware connection yet from your IP "** wait 5 minutes, IF nothing has happened pull the power and then plug it back in (to reboot in the future please use the control panel on your personal stats page)

After 10 minutes if it hasn't appeared pull out the SD card and verify you typed your settings in correctly. If that doesn't fix it you can try to reprogram the SD card. Lastly contact support at ADSBsupport@flightaware.com

3. After it is claimed you will see:

(Sometimes the screen will continue to refresh after claiming but it will be listed under the linked PiAware Receivers so you will know it functioned)

Success!

You claimed the following 1 receivers:

4. Under section 1 of the page **View your ADS-B statistics** there is a link to your page, follow it.
5. Check you the Control Panel please customize it to your preference

The screenshot shows the 'Control panel' for a PiAware receiver. It contains several settings: 'Public Profile and Name' with a dropdown set to 'User Page activated, only show Username'; 'Site name (private)' with a text input and a note 'Custom name for this site shown only to you.'; 'Precision on coverage map' set to '10 km' with a note 'For privacy, customize how accurately should FlightAware show your receiver location on maps.'; 'Outage e-mails' set to 'Notify after 12-hour outage' with a note 'Get notified when FlightAware stops receiving positions from your site.'; 'Auto-update PiAware software' set to 'Allow auto-updating' with a note 'Automatically keep this site's PiAware software up to date.'; 'Mode S Multilateration (MLAT)' set to 'MLAT enabled' with a note 'Send non-ADS-B data for Multilateration (MLAT)'; and a 'Send command to device' section with a dropdown and a 'Send command' button.

6. Set your location

The screenshot shows the 'Site information' page. It displays various statistics: 'Data Feed: Live - less than a minute ago', 'Feeder Check-in: Live - less than a minute ago', 'Joined: [blank]', 'Longest Streak: [blank]', 'Feeder Type: PiAware (SD Card) 3.1.0', 'Multilateration (MLAT): Supported / Enabled (synchronized with 33 nearby receivers)', and 'Nearest Airport: Houston Bush Int'l (Houston, TX) (GIAJ) - United States'. On the right side, there are fields for 'Site identifier', 'Internet IP', 'Site local IP', 'Web interface' (with a link to 'view live data'), 'Ground elevation', and 'Antenna height above ground level: 2 feet'. A red arrow points to a 'Configure location' button, which is highlighted with a red box. Below the button, there are fields for 'Location' and 'Location Set'.

7. Then view your live map (The map might be centered over Europe and you will need to drag the map to view your location.)

This screenshot is identical to the previous one, showing the 'Site information' page. A red arrow points to the 'view live data' link in the 'Web interface' field, which is highlighted with a red box. The 'Configure location' button and its associated fields are also visible.

8. Enjoy!