

## Updating your FlightCoach flight control board firmware

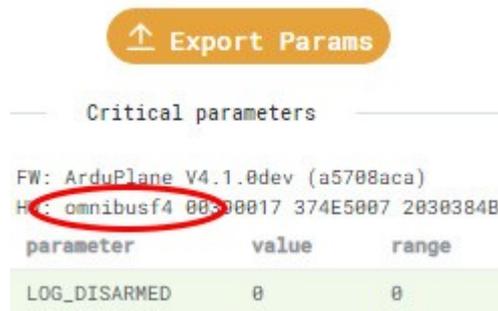
Regardless whether you purchased a ready to go FlightCoach system, or have assembled one yourself it is always worthwhile keeping the firmware up to date. Why? Ardupilot is improving all the time, and running the latest version can help capture a great log file.

The ArduPilot website has great information on updating flight control boards, but the below information should get the job done! If your board does not have ArduPilot firmware on it, please see the Ardupilot website for more information on how to proceed.

If you want to see a nice video from the experts, make yourself a coffee and have a look at the video Andrew Tridgell made here <https://youtu.be/6RTiIBIA9zY> The video explains everything really well.... Please use the below in conjunction with the video.

### 1. Identify your flight control board

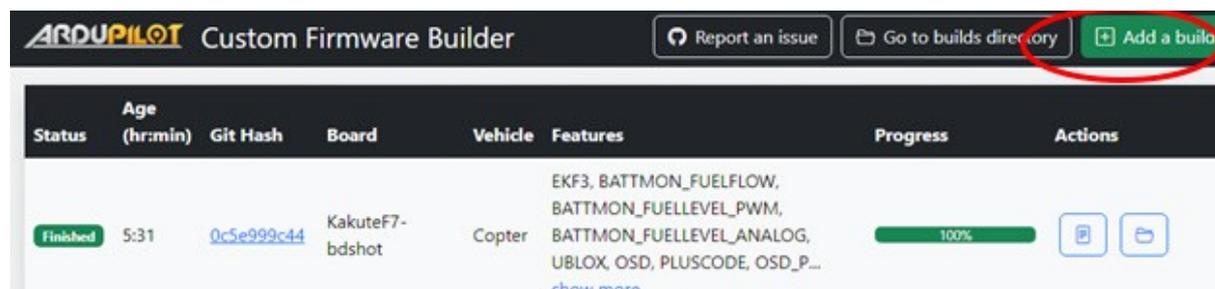
Some boards may have their name screen printed on the board. Many do not. The easiest way to be sure you get the correct firmware is to open a .BIN (log) file in The Plotter. Go to settings, and you will now find a helpful table of critical parameters - and above this table you will find the identity of your flight control board.



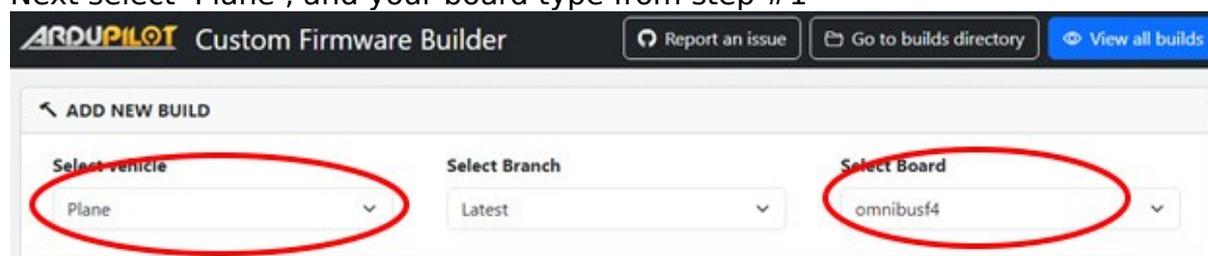
You can now close The Plotter.

### 2. Build your new firmware

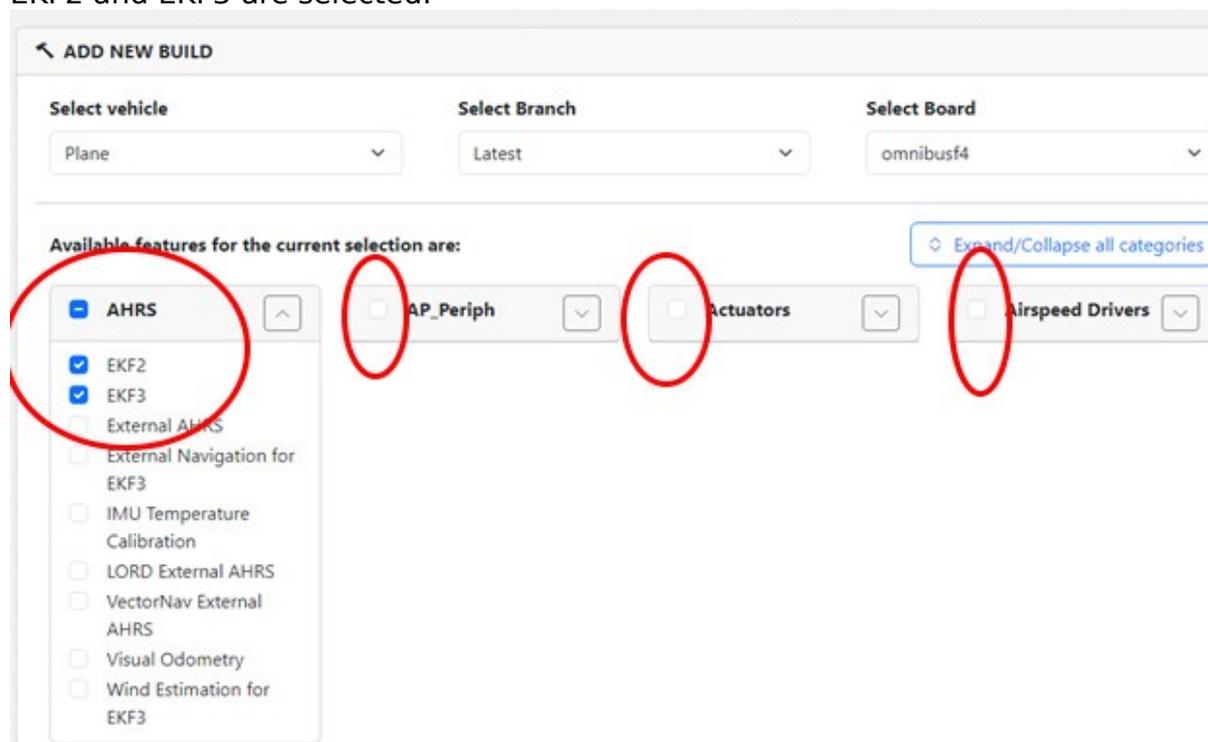
Now open this webpage <https://custom.ardupilot.org/> and at the top right click on the button 'add a build'.



Next select 'Plane', and your board type from step #1

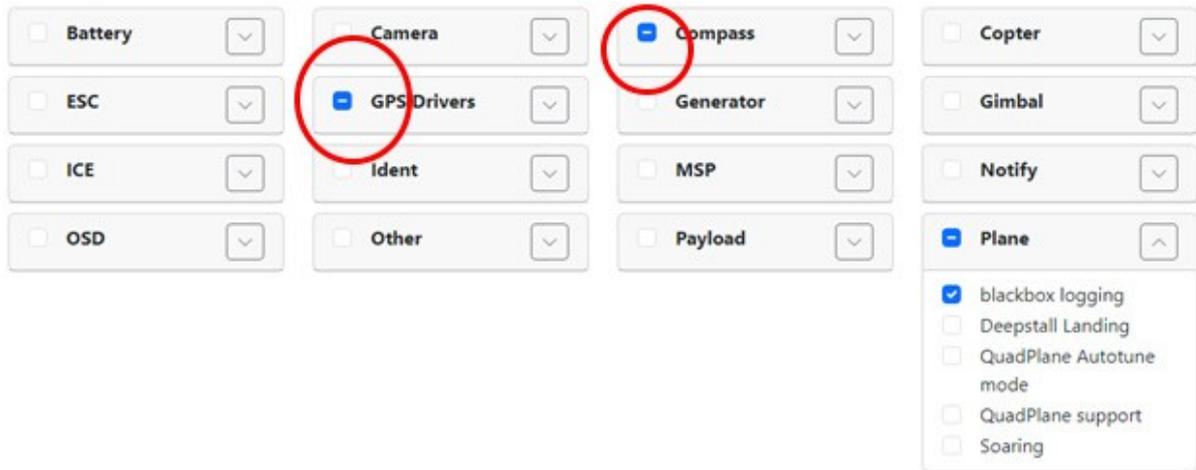


Now lets select the options we need, and remove what we do not. Be sure both EKF2 and EKF3 are selected.

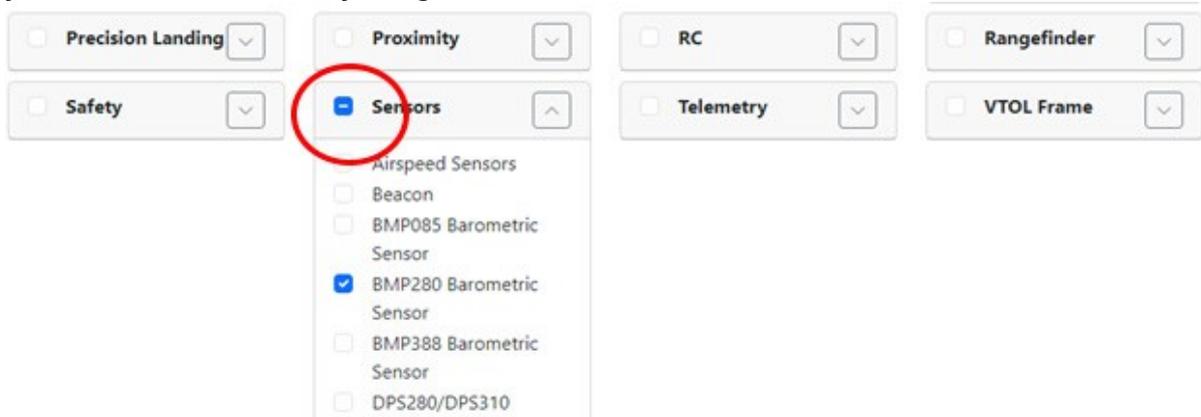


Leave Compass and GPS Drivers with the defaults selected.

Under 'Plane' you \*may\* want to select 'blackbox logging'. This option helps minimise the size of your log files by only logging if your speed is greater than 5m/s (there is a built in delay here so logging continues during stalled manoeuvres). This means you can keep the logger powered up between flights. However, this will require some parameter changes - so you may wish to skip this for now, but consider including it in a build later on.



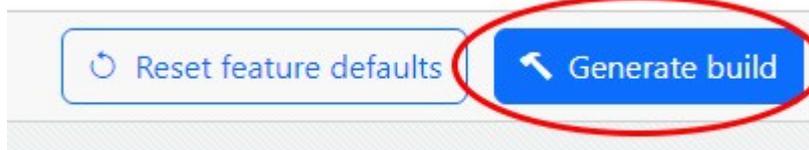
De-select everything as below, but under sensors leave your barometer selected. Depending on your board, there may be different requirements here - basically you can de-select everything but the barometers.



Finally de-select VTX



At last click 'generate build'



Once the build finishes click 'Close'

## Build log



```
[817/826] Compiling ArduPlane/ekf_check.cpp
[818/826] Compiling ArduPlane/mode_autotune.cpp
[819/826] Compiling ArduPlane/mode_qrtl.cpp
[820/826] Compiling ArduPlane/tuning.cpp
[821/826] Linking ../omnibusf4/bin/arduplane
[822/826] Generating bin/arduplane.bin
[823/826] app_descriptor ../omnibusf4/bin/arduplane.bin
No APP_DESCRIPTOR found
[824/826] apj_gen ../omnibusf4/bin/arduplane.bin
[825/826] bin cleanup ../omnibusf4/bin/arduplane.bin
[826/826] Generating bin/arduplane.hex
Waf: Leaving directory
`/mnt/volume_nyc3_01/custom/base/tmp/plane:omnibusf4:52743787b222a3852d1728bce5600a81cf874cc5:be33
8983a7d2816feb8078876832c1cc/omnibusf4'

BUILD SUMMARY
Build directory:
/mnt/volume_nyc3_01/custom/base/tmp/plane:omnibusf4:52743787b222a3852d1728bce5600a81cf874cc5:be338
983a7d2816feb8078876832c1cc/omnibusf4
Target      Text (B)  Data (B)  BSS (B)  Total Flash Used (B)  Free Flash (B)  External Flash
Used (B)
-----
bin/arduplane  730164    736    130420           730900           252124  Not Applicable

Build commands will be stored in ../omnibusf4/compile_commands.json
'plane' finished successfully (1m4.054s)
done build
BUILD_FINISHED
```

Auto-Scroll



3. Now download the firmware  
Click on the folder icon here, to open the build directory

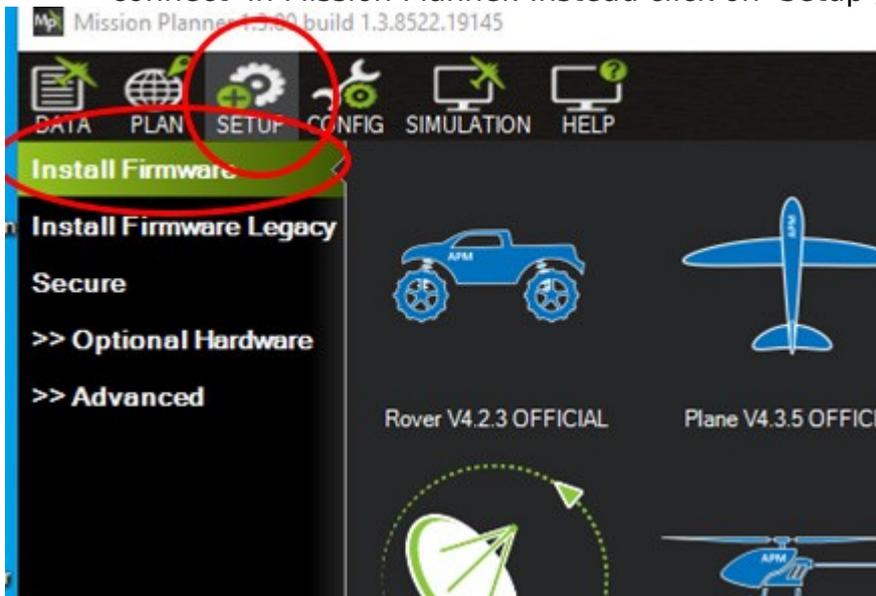
Status	Age (hr:min)	Git Hash	Board	Vehicle	Features	Progress	Actions
Finished	5:43	<a href="#">0c5e999c44</a>	KakuteF7-bdshot	Copter	EKF3, BATTMON_FUELFLOW, BATTMON_FUELLEVEL_PWM, BATTMON_FUELLEVEL_ANALOG, UBLOX, OSD, PLUSCODE, OSD_P... <a href="#">show more</a>	100%	

You will see a page like this. Click on the Arduplane.apj file – that should then download to your computer.

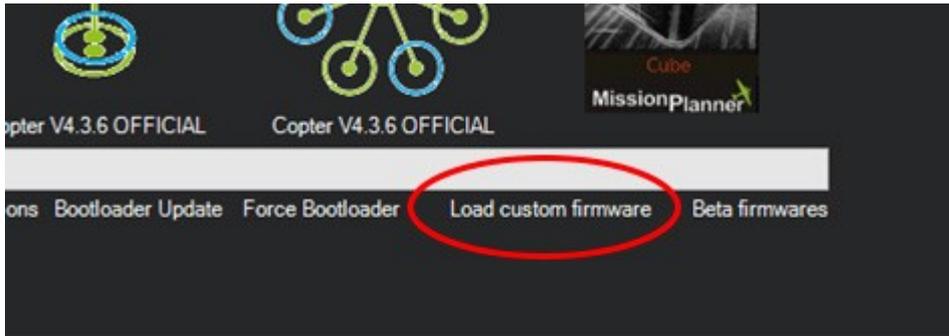
# Index of /builds/plane:omnibusf4:52743787b222a

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 <a href="#">Parent Directory</a>		-	
 <a href="#">arduplane</a>	2023-05-18 17:47	1.3M	
 <a href="#">arduplane.apj</a>	2023-05-18 17:47	656K	
 <a href="#">arduplane.bin</a>	2023-05-18 17:47	714K	
 <a href="#">arduplane.hex</a>	2023-05-18 17:47	1.9M	
 <a href="#">arduplane_with_bl.hex</a>	2023-05-18 17:47	2.1M	
 <a href="#">build.log</a>	2023-05-18 17:47	99K	
 <a href="#">extra_hwdef.dat</a>	2023-05-18 17:45	16K	
 <a href="#">selected_features.json</a>	2023-05-18 17:45	207	

4. Phew... half way there - you have the latest firmware! Next download and open Mission Planner on your computer. Information on installing Mission Planner is available here <https://ardupilot.org/planner/docs/mission-planner-installation.html>
5. Plug your flight control board into your computer - but do not click 'connect' in Mission Planner. Instead click on 'Setup', 'Install Firmware'



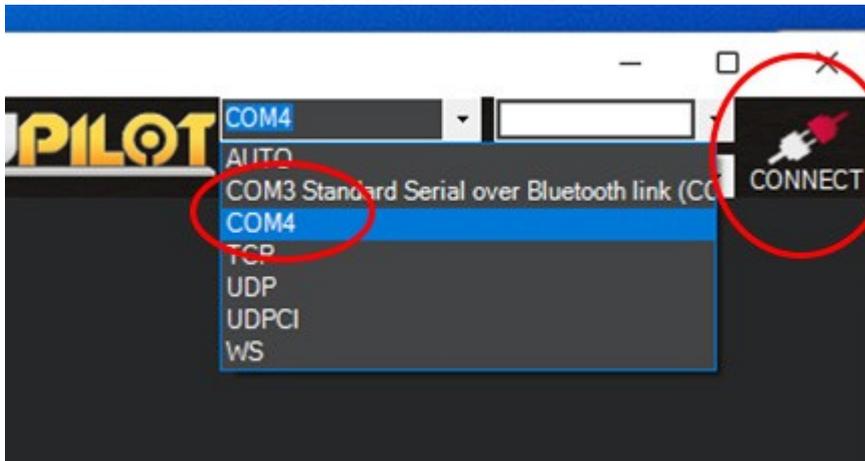
The click on 'Load Custom Firmware'



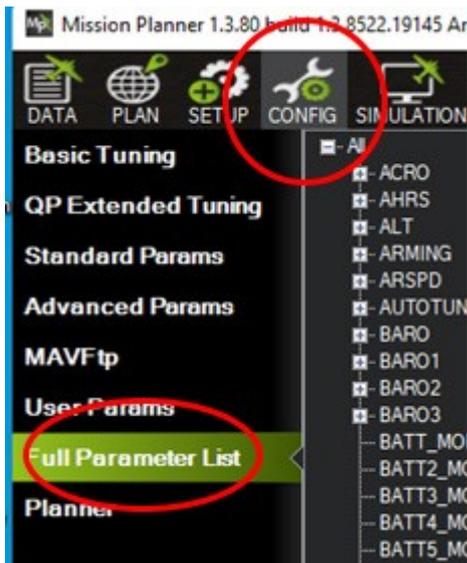
Select the firmware file you downloaded in step #3. Follow the onscreen instructions - you may be asked to unplug your board and plug it back in.

Finally, there are some Ardupilot parameters you can check / change to optimise your log files. For information on parameters see the ArduPilot website. Here I will give a quick run-through.

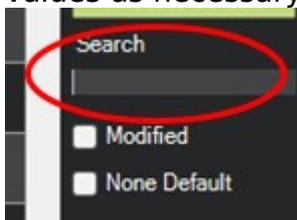
So with Mission Planner still open select the correct com port for your flight control board. Then click on 'Connect'



Once the board is connected, click on 'Config', 'Full Parameter Tree'



Then enter each of the following parameters in the search box, and change the values as necessary.



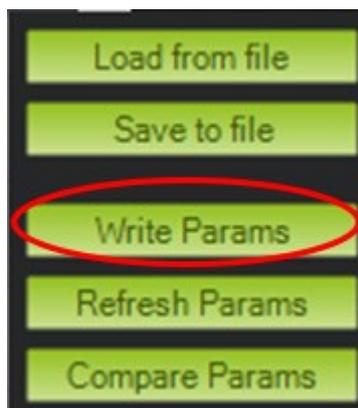
If you are using \*not\* using the Black Box logging firmware, your existing parameters should work and not need changing. If you are having trouble, these parameters may help:

LOG_DISARMED	0
LOG_FILE_DSRMROT	1
LOG_FILE_RATEMAX	30
ARMING_REQUIRE	0
EK2_ENABLE	1
EK3_ENABLE	1
Arming_check	1032
Arming_rudder	0

If you are using the Black Box logging firmware, you will want to update your parameters as shown below.

LOG_DISARMED	0
LOG_FILE_DSRMROT	1
LOG_FILE_RATEMAX	30
ARMING_REQUIRE	1
EK2_ENABLE	1
EK3_ENABLE	1
Arming_check	1032
Arming_rudder	0

REMEMBER: You must click 'Write params' to save the changed parameters!



You can now disconnect the flight control board.

FAQ's:

1. Do I need to update my firmware? No - but running the latest firmware helps with gathering the best log data.
2. Why set LOG\_FILE\_RATEMAX? This parameter has a big effect on log size. Logging at this rate is plenty of data points.
3. Why enable EK2? This can be useful during trouble shooting a poor log file.
4. What about LOG\_DISARMED, LOG\_FILE\_DSRMROT, ARMING\_REQUIRE? These parameters allow the new black box logging to do its job.
5. Should I do a compass calibration in the plane? YES. If you have set the hardware up yourself you have probably done this. If you have purchased a pre-configured system, you should still do a compass calibration in the plane! Read about that on the ArduPilot website.