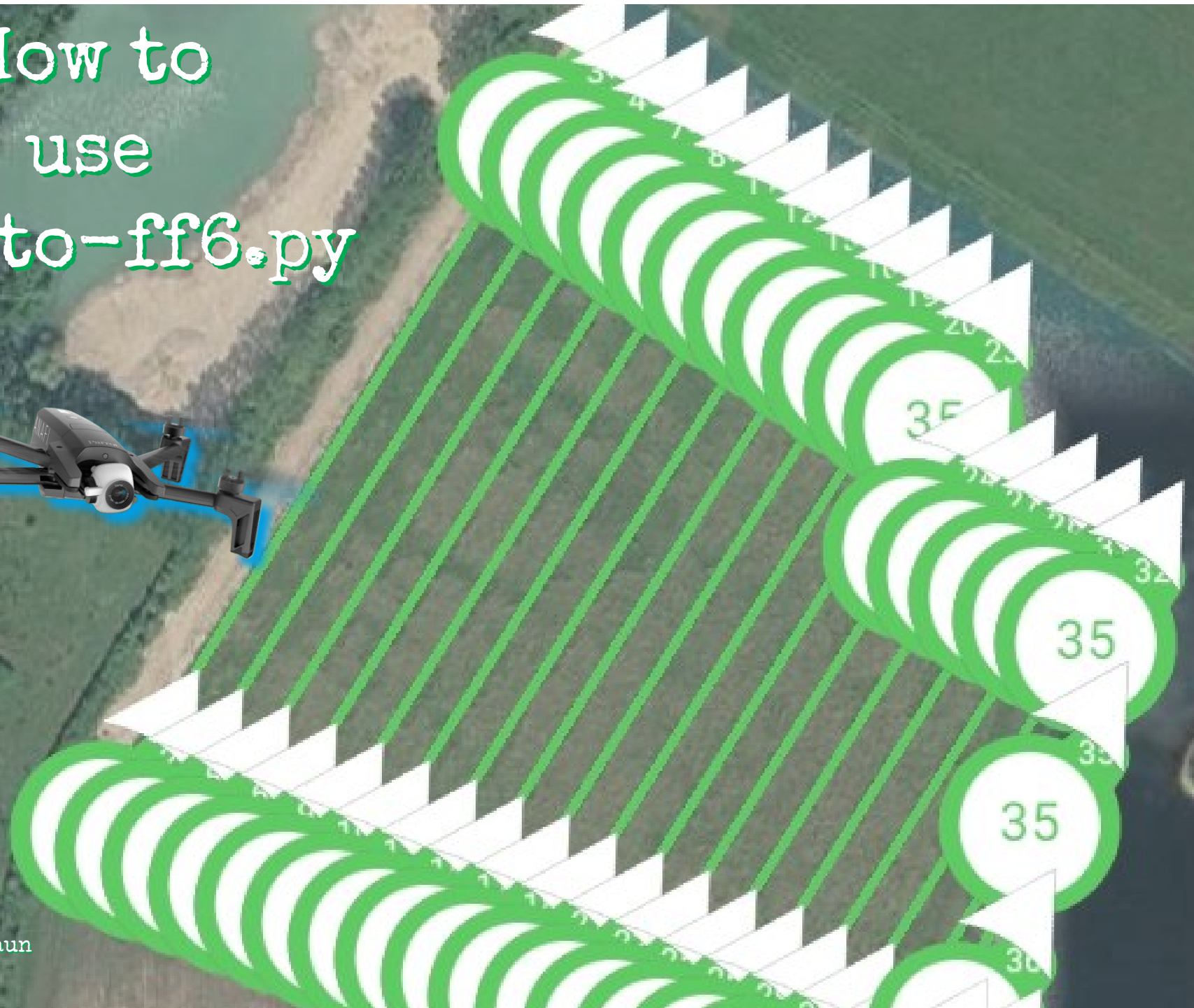


How to use qgc-to-ff6.py



0. INTRODUCTION

WHY THIS PROGRAM?

The following `qgc-to-ff6.py` script converts a QGroundControl Survey Mission (.plan) into a compatible `savedPlan.json` file for FreeFlight 6.

This workflow is mainly intended for:

- *photogrammetry missions*
- *orthophoto generation*
- *terrain modeling*
- *mapping*

The main advantage is the ability to prepare precise automated survey missions in QGroundControl and execute them using FreeFlight 6.

ABOUT THE ANAFI CAMERA SENSOR

The Parrot ANAFI camera is based on the Sony IMX230 CMOS sensor, a 21-megapixel stacked back-illuminated Exmor RS sensor originally designed for high-resolution mobile imaging applications. Main specifications:

- *native resolution: 5344×4016 px*
- *sensor size: 5.99×4.50 mm*
- *optical format: 1/2.4"*

Press Release: **Sony Announces the Exmor RS™ IMX230**

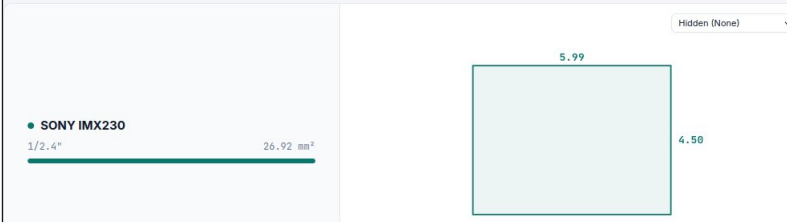
www.sony.com/en/SonyInfo/News/Press/201411/14-112E/

The ANAFI imaging system uses:

- *fixed aperture: f/2.4*
- *ASPH low-dispersion lens*
- *rolling shutter sensor architecture*

Using the sensor dimensions of the IMX230, this corresponds to an actual physical focal length of approximately ~4.04 mm, which is typical for compact 1/2.4" aerial imaging systems (see ANAFI White Paper v1.4, page 8).

www.parrot.com/assets/s3fs-public/2020-07/white-paper_anafi-v1.4-en.pdf

PHYSICAL GEOMETRY	
Parameter	SONY IMX230
Format (Type)	1/2.4"
Diagonal (mm)	7.487
Effective Area (mm²)	26.921
Aspect Ratio	4:3
Pixel Pitch (µm)	1.12
Pixel Layout	RGB
	

 <https://cmosdb.com/?model=IMX230>

1. CONFIGURE QGROUNDCONTROL PARAMETERS

Before creating your survey mission, configure QGroundControl correctly.

Script requires a typical mission like this:

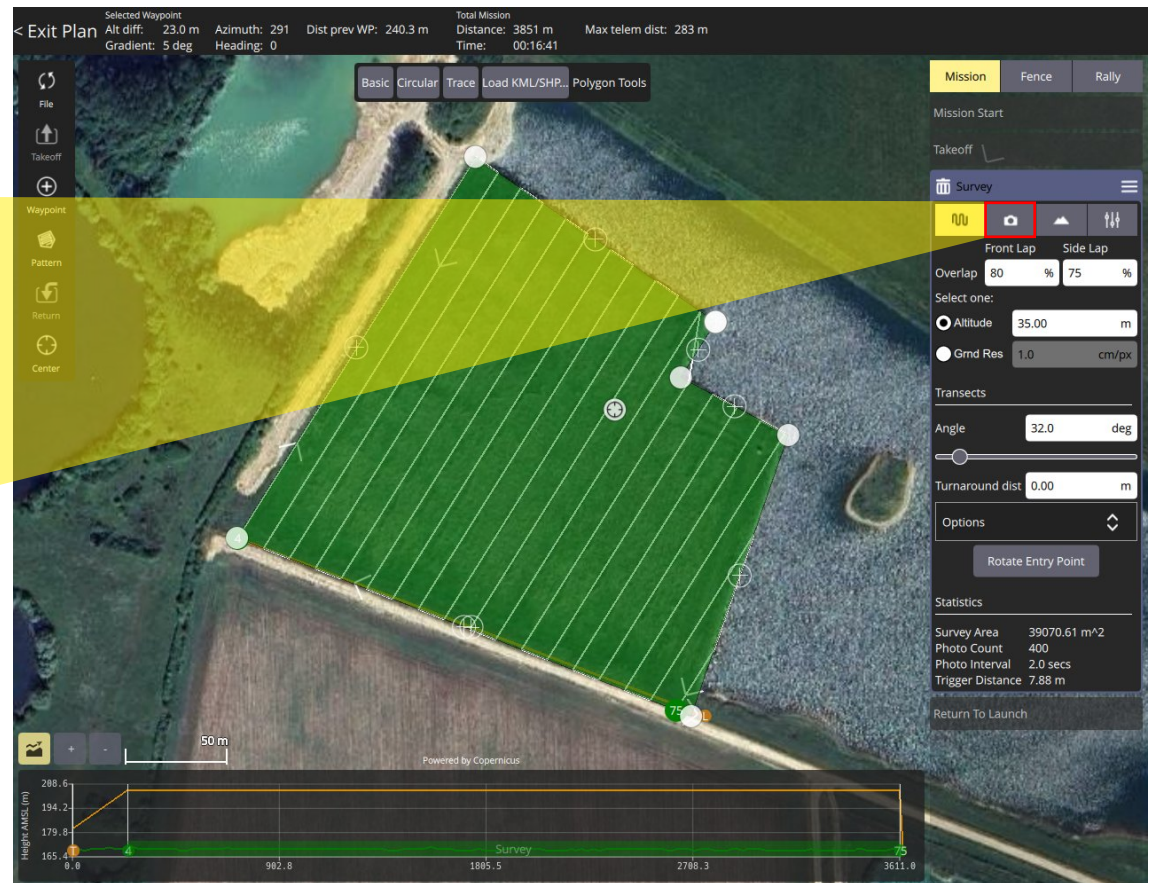
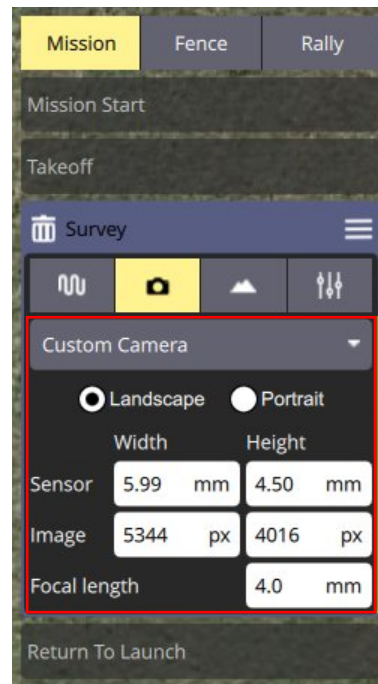
- Mission Start
- Takeoff
- Survey
- Return To Launch

Camera settings should be like this:

Custom Camera:

- Landscape
- Sensor Width: 5.99 mm
- Sensor Height: 4.50 mm
- Image Width: 5344 px
- Image Height: 4016 px
- Focal length: 4.0 mm

These values match the ANAFI camera specifications.



2. PREPARE YOUR FLIGHT PLAN IN QGROUNDCONTROL

2-1. FLIGHT ALTITUDE

Recommended altitude range: **2 m to 150 m**

In QGC settings:

Altitude settings should be like this:

Notes:

- Flight altitude determines the relationship between image footprint and ground resolution.
- Lower altitudes result in higher ground resolution over a smaller coverage area. Higher altitudes increase the covered area per image while reducing the overall number of photographs required for the mission.
- For a given camera sensor and focal length, the resulting Ground Sampling Distance (GSD) is directly proportional to the flight altitude.



2. PREPARE YOUR FLIGHT PLAN IN QGROUNDCONTROL

2-2. FLIGHT SPEED

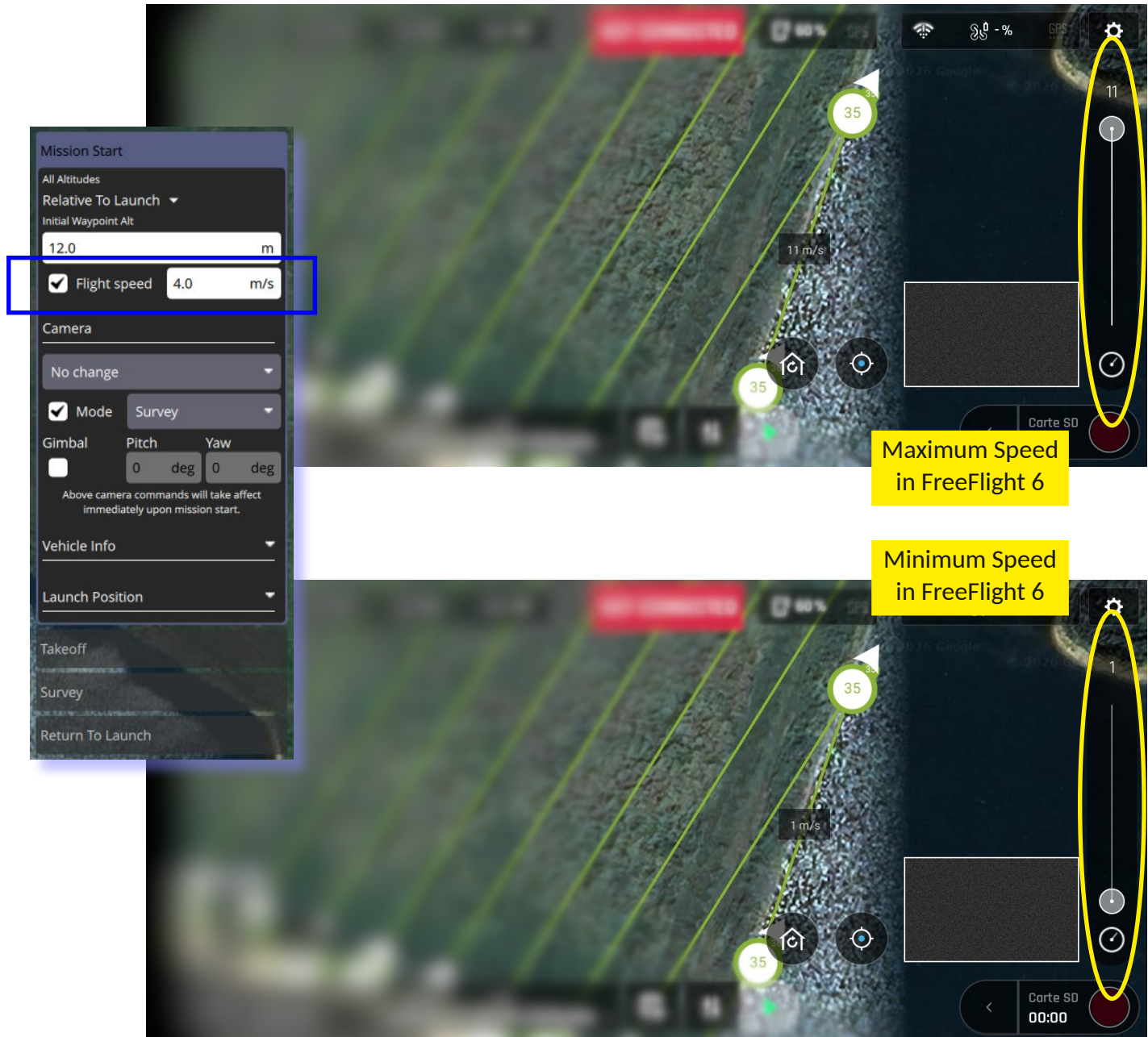
Recommended speed range: 1 m/s to 11 m/s

In QGC settings:

Speed settings should be like this:

Notes:

- The selected flight speed directly affects the image trigger interval.
- As flight speed increases, the time available between two consecutive photographs decreases.
- The generated mission must therefore maintain a trigger interval greater than 2 seconds.



2. PREPARE YOUR FLIGHT PLAN IN QGROUNDCONTROL

2-3. TRIGGER INTERVAL

The generated trigger interval must remain: ≥ 2 seconds

The script automatically calculates the interval from trigger distance / survey speed.

If the calculated interval is lower than 2 seconds:

- *the script stops*
- *no valid savedPlan.json generated*

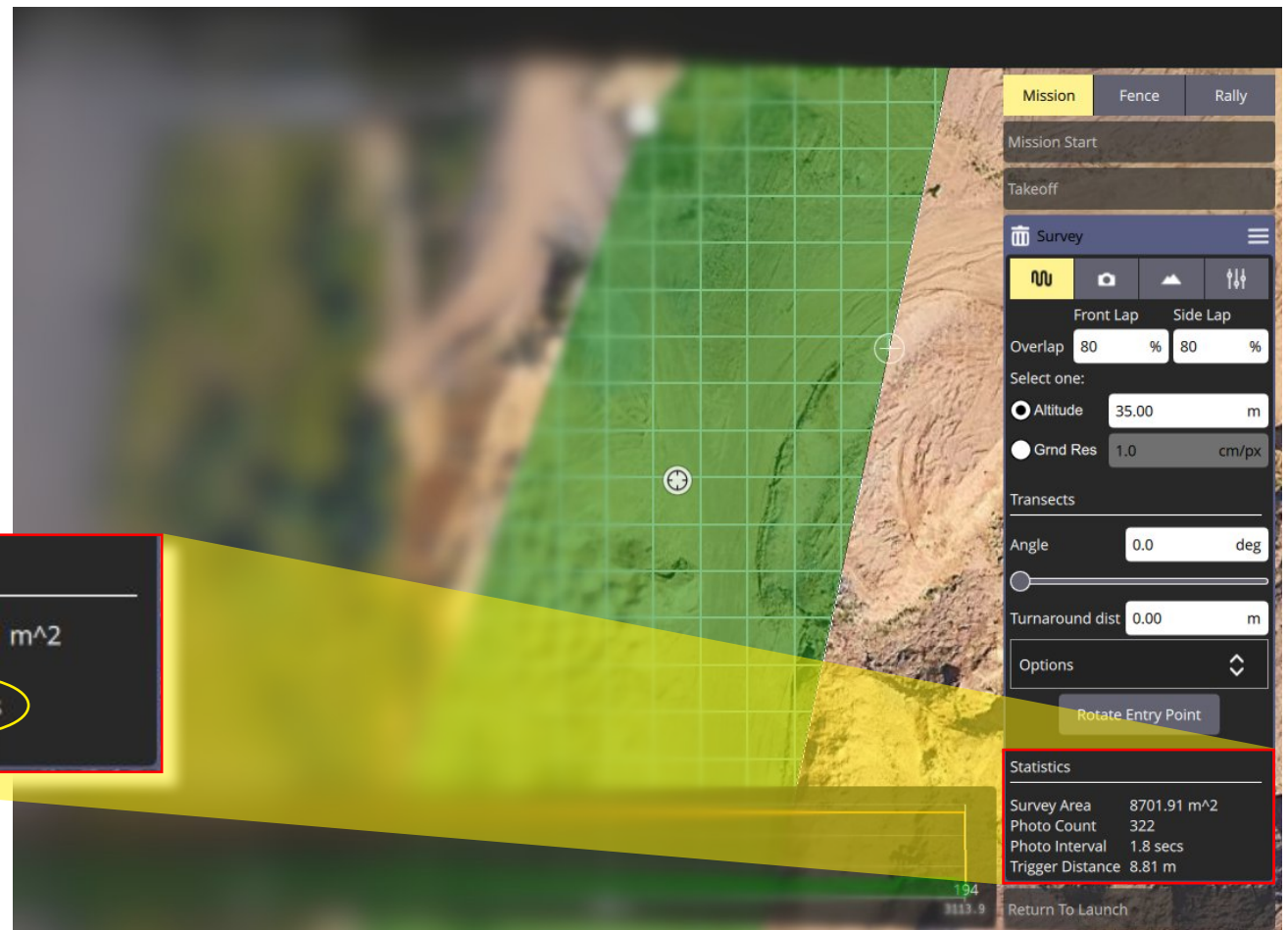
This limitation helps prevent:

- *camera capture buffer overload*
- *delayed image writing to SD card*

A warning message is displayed in the terminal:

Warning! Trigger Interval is 1.8 second(s).
Program is stopped...

Statistics	
Survey Area	8701.91 m ²
Photo Count	322
Photo Interval	1.8 secs
Trigger Distance	8.81 m



3. CONVERT THE .PLAN FILE

Project repository: <https://gitlab.com/epysod12/qgc-to-ff6>



Run the Python script:

```
python3 qgc-to-ff6.py /home/<...>/example.plan
```

The converter generates:

```
/home/<...>/example/  
├── savedPlan.json  
├── survAzDst.csv  
├── uavMavCmd.csv  
└── waypoints.csv
```

- **savedPlan.json** → *Flight plan for FreeFlight 6.*
- **survAzDst.csv** → *Survey azimuth and distance data for visualization in QGIS.*
- **uavMavCmd.csv** → *Debug log of generated FF6 mission commands.*
- **waypoints.csv** → *List of generated waypoints and trigger intervals.*



The output files are created in the same directory as the input .plan file.

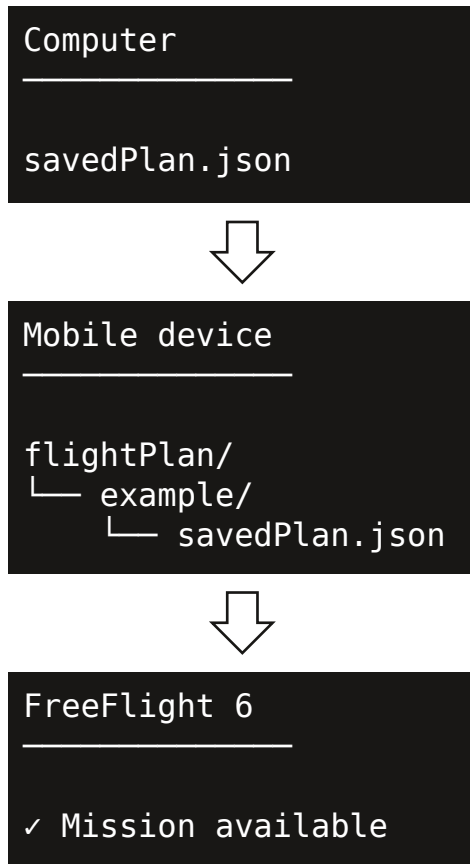
Only **savedPlan.json** is required by FreeFlight 6.

The remaining CSV files are intended for debugging and optional GIS analysis.

4. TRANSFER THE FLIGHT PLAN TO THE DEVICE

Transfer `savedPlan.json` to the **flightPlan** directory on your mobile device.

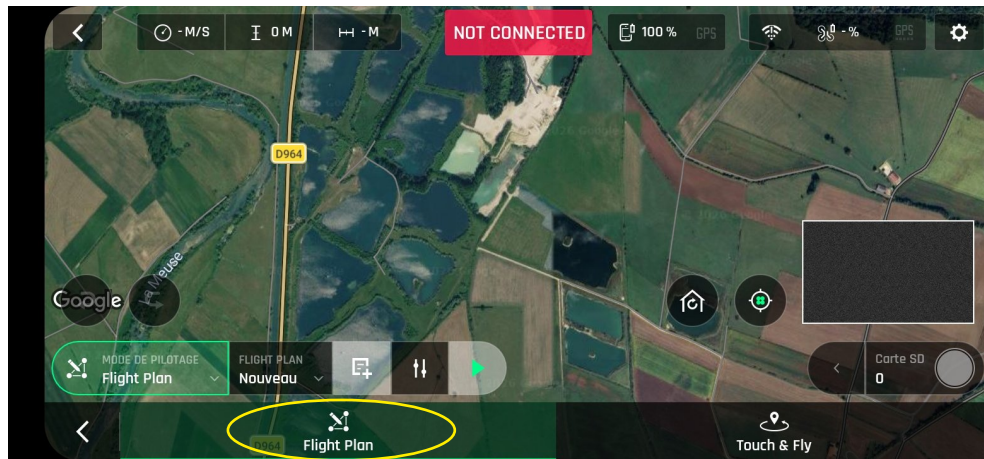
Workflow:



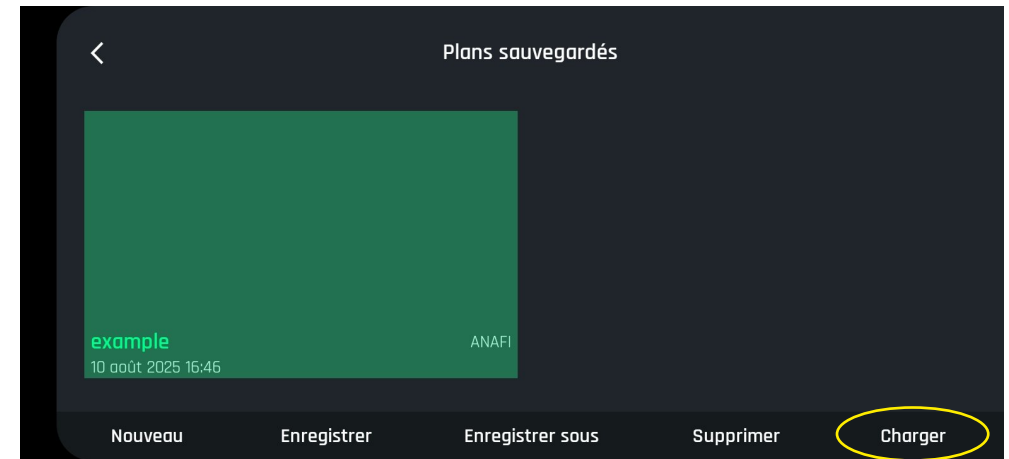
Illustrated using Android. The generated `savedPlan.json` can be transferred to any device running FreeFlight 6.

Some FreeFlight 6 / USA installations do not create the **flightPlan** directory automatically. If it does not exist, create it manually.

5. EXECUTE THE FLIGHT PLAN ON FREEFLIGHT 6



Enter Flight Plan mode



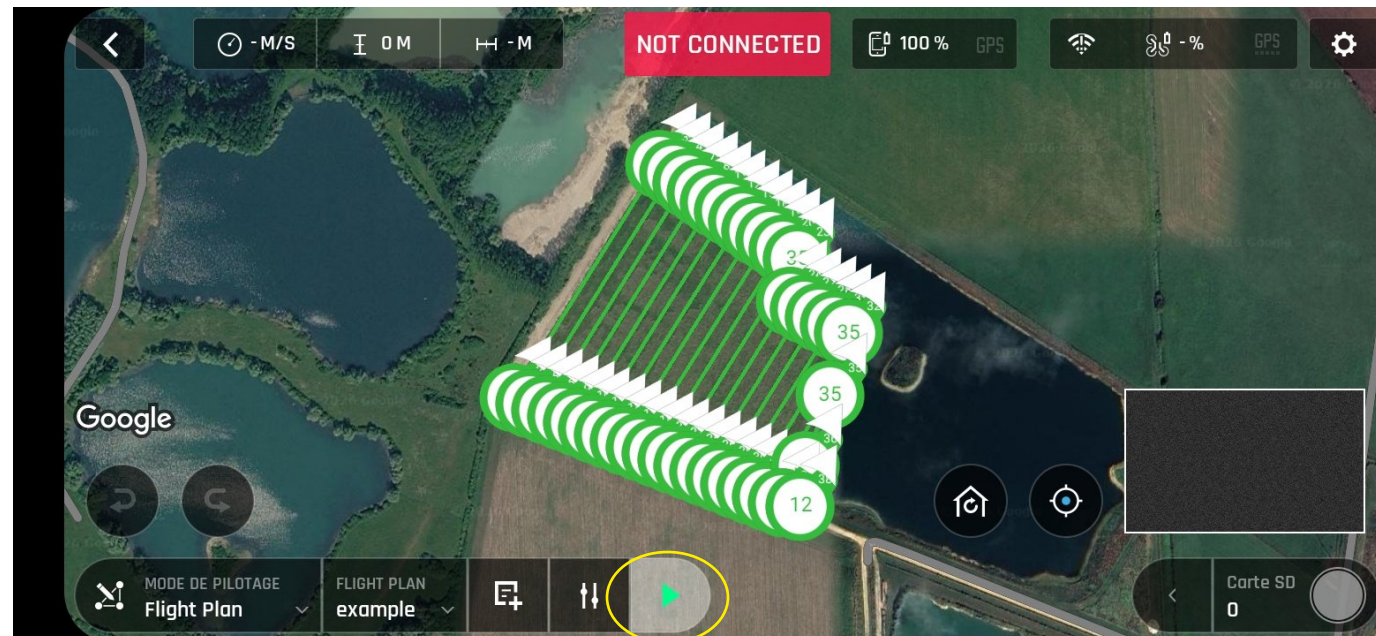
Select and load the saved mission

Wait for GPS
synchronization, then
load the mission.

Before takeoff, verify:

- altitude
- orientation
- mission area
- takeoff position

Happy Flying!



Review and start the loaded mission

6. FINAL NOTES

How it works:

- *QGroundControl* is used to design the mission.
- *FreeFlight 6* executes the converted mission.

Advanced features:

- **Camera Pitch:** *preserved from QGroundControl settings (0° to -90°).*
- **TurnAroundDistance:** *supported when defined in QGroundControl mission.*

During the flight:

- *Commands are sent to the drone in real time.*
- *Reliable communication link is essential.*

Keep a clear line of sight and orient the SkyController antenna toward the drone:

