## Planning your Survey

It is very important that you plan your flight area with a suitable and sufficient overlap, otherwise no reliable results can be obtained with statistical stitching. If the overlap is too small, or conversely too large, you will get poor or no results. The overlap is centrally dependent on the flight altitude and the camera parameters as well as the acquisition frame rate. Some empirical low budget camera parameters are listed below.

## Ground Resolution of typical cameras

| **ASL Alt m** | **GP8MP3+ (cm)** | **GP12MP3+ (cm)** | **DJI P3 4K (cm)** | **MAPIR 2**  **(cm)** |
| --- | --- | --- | --- | --- |
| **15** | 1,08 | 0,9 | 0,63 | 0.56 |
| **30** | 2,16 | 1,8 | 1,27 | 1,03 |
| **75** | 5,4 | 4,5 | 3,2 | 2,53 |
| **100** | 7,2 | 6,0 | 4,25 | 3,38 |

## Suggested Overlap

Front Overlap 80%, Side Overlap 60%

## Camera Speed

Depending on the product and manufactor of the cameras you have to deal with different speeds. **Note:** only the speed that can be **continously** achieved is taken into account. Currently a picture rate of **2 sconds** is the maximum.

**It is strongly recommended that you use (if available) the autonoumous camera timer for controlling the take of pictures.**

## Flight Speed

On average the fasted SD Cards will be able to achieve an average speed of about 2 seconds/JPEG (Raw + JPEG 3.5 seconds) image. As a result taking pictures every 2 seconds will be a sporty attempt. The Flight speed recommodations are meeting this needs. Let us assume you fly a task with the field of view (FOV) of the DJI 4K camera at 35 meters above level (agl). To derive the maximum flight distance from picture to picture in meter for the given overlap you have to calculate:

FOV\*agl\*(1-overlap) = 1,71\*35\*0,2 = *12 m*

If you can take every 2 seconds a picture your max speed is: *12 m / 2 s = 6 m/s*

## Rule of thumb

For JPG pictures: 0,15 \* agl (RAW; 0,07 \* agl)

**For a 100 meter AGL flight you should set the speed to a maximum of:**

**0,15 \* 100 = 15 m/s (54 km/h).**

For a flight of 35 m agl this is will be roughly *5,25 m/s*

# Additional Data

If you fly in an wide open flat area you do not need additional data. But if you fly in middle range mountains,forests or similar complex structures you will need a digtal surface model (DSM/DEM) for retrieving an optimal flight path. Actually you also should check the weather –

no flying with Beaufort > 3 it‘s a uav not the falcon.

## Workflow

1. Plan you r flight with an adequate planning toolbest at home and control it in the field (see [examples](http://giswerk.org/doku.php?id=projekte:micrors:fpusecases), check your flightplan)
2. Setup your Remote Controller
3. Setup your controlling device
4. Setup your UAV
5. Setup your camera(s)
6. Start RC
7. Start UAV
8. Start Camera
9. Load Task
10. Fly Task

As simple this seems to be it is full of pitffalls . Therefore we provide some checklist:

## Pretask Check

**UAV**

q Batteries Fully Charged

q remote control (charged)

q Props

q cables

q cleanup MicroSD cards

q charge camera(s)

q configure camera(s)

q charger

q minute book

q Power Pack

**Tools**

q Tools for the uav

q Tape, Glue etc.

q Table Chairs etc.

**Survey**

q Survey is checked

q Task isstored on controllers

**Legal stuff**

q insurance valid

q common flight permission

q specific permissions

q necessary to inform DFS

q necessary to inform local air control

## Launch Check

**Launch**

q setup uav

q parachute mounting

q parachute autocontrol

q sim card

q start rc

q start tablet

q start UAV

q check RC connection

q check video connection

q start camera(s)

q check camera setting

q start uav

q load task(s)

q start auto flight

**Post flight**

q disarm uav

q quick uav check

q write log to field book

| **Flight Log University Marburg** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Time** | **Mission** | **Location** | **Wind** | **Airframe** | **Battery** | **Flight duration** | **Flight altitude** | **Remarks** |
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