

DJI PHANTOM 4 RTK MISSION PLANNING GUIDE



Table of Contents

1.0	Objectives	1
2.0	Pre-Mission - In office connected to internet	1
3.0	Mission Planning	2
	o RTK - Base Station	4
	o PPK - Aerotarget Flight	5
4.0	Operational Tips	5
5.0	References	6
6.0	Acronyms	6
7.0	Helpful Screenshots	6

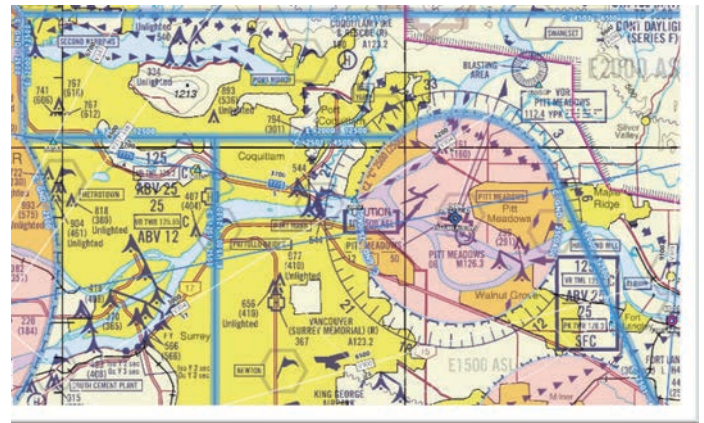
1.0 Objectives

- o Preparing for a successful flight
- o Identifying airspace restrictions
- o Planning a mission
- o Capturing RTK data
- o Capturing PPK data

2.0 Pre-Mission

- In office connected to internet

- o Identify the flying area for your mission
 - o Note any restrictions
- o Identify [airports or heliports \(CFS\)](#)
 - o Contact for approvals
- o Identify airspace for flight (Airspace: A-G)
 - o File [NAV Canada RPAS](#) request
 - If not in Class G



- Contact Airspace Operator
 - Some areas have active helicopter activity and coordination of airspace is required with the operating outfit.
- ie. Royal Columbian Hospital
 - helipad medevac operations
- Contact information is found in the CFS
- DJI Users:
 - Once approvals have been received from required airspace owners
 - Use the [self-unlock portal](#) to release the drone in the DJI app.
- Charge your Batteries
 - Drone, RTK base, iPad and Controller
- Ensure an adequate microSD card is inserted into the drone
 - UHS-1 V30 of 64GB or larger
 - There will be approx. 3,500 photos for a 160 Acre area
- Check for firmware updates
 - Connect your controller and drone to the internet
 - Follow on-screen prompts
 - Update any required modules
- Check there are no warnings in the status bar
 - Note: some errors will be present due to low light and reduced GPS visibilities as you will be inside a building
 - Know how to [calibrate the compass](#) before you get to the field
- Power down drone then controller when finished updating

3.0 Mission Planning

- Identify where you want to launch from before starting your mission
 - Choose a good vantage point that will allow VLOS at all times
- We recommend tethering your controller to the internet via hotspot connection
 - Alternatively, you can preload your map before heading to the field allowing the app to cache the area you're planning to fly
- Missions can be planned by
 - Using the on-screen status app in the DJI RTK controller
 - Importing KML file of the survey area into the app from Google Earth
- Planning the mission
 - Tap Plan

- Photogrammetry 2D (for a free-style polygon) or Linear flight planning
- Pan around on the map to locate your flight area
- Tap screen to set your boundary parameters
 - White arrow tab on the right will open the mission settings panel
- Mission Settings tab
 - Altitude 60m – 90m
 - Select the max available speed after the polygon is made
 - Distance Shooting
 - Return to home
 - Alt Optimization – off
 - Relative Height – 0
- Camera Settings
 - 3:2
 - Sunny (or cloudy)
 - Average
 - -90*
 - Shutter priority
 - 1000
- Advanced Settings
 - 75% (no less than 60%)
 - 75% (no less than 60%)
 - Manual
 - -2m margin
- Mission path orientation
 - Use the yellow dot to orient the mission
 - Watch the mission 'estimated flight time' for optimal time - while adjusting the grid
- Save Mission with a unique name
 - We can later find this mission plan from the home screen
 - Fly
 - Select the document icon
 - Choose Plan [executing will be the default]
 - Select the mission you previously created
- Aircraft Settings
 - Ensure you have an active home point prior to takeoff
 - Set an accurate RTH height
- Set your max altitude to not bust altitude restrictions



- Set max flight distance to your comfort level
- Ensure RC Signal lost is set to return to home
- When flying in restricted airspace (by the DJI app)
 - You will need to select 'Unlock certificate list' and tap synchronize.
 - Then synchronize to aircraft
 - Once this step is complete a few more acceptance screens will pop up and you will be unrestricted to fly in the DJI Restriction Zone.
 - Note this is required to do from a desktop at the link in section 2 above
- **RTK – Base Station**
 - Place the Base with tripod and level it
 - Turn it on by pressing once then pressing and holding the middle button
 - Blue lights will flash to indicate startup
 - Do not move base once you've turned it on
 - At this time, you can set the aircraft into RTK mode as mentioned above
 - Once the RTK base station will have the appropriate satellites and corrections
 - "Home point recorded" will be announced by the controller
 - Indicating a green RTK Flight status bar.
 - Open the DJI Ground Station app – Pre Planned Mission
 - Select Fly menu
 - Select the Document icon
 - Select Plan
 - Select your previously saved mission or plan your mission at this time
 - Confirm parameters
 - Select Invoke
 - Aircraft will configure itself for takeoff
 - Follow onscreen prompts.
 - If flying an RTK mission
 - Ensure base is on, and 2 solid green (left and mid) 1 flashing (right) green light are present
 - Select Aircraft RTK positioning ON
 - Select maintain positioning accuracy mode
 - Select RTK service type as the D-RTK2 Mobile Station
 - Note: Aircraft must be on ground engines off
 - Momentary disconnection from aircraft will occur
 - You are now ready to fly your mission in RTK mode

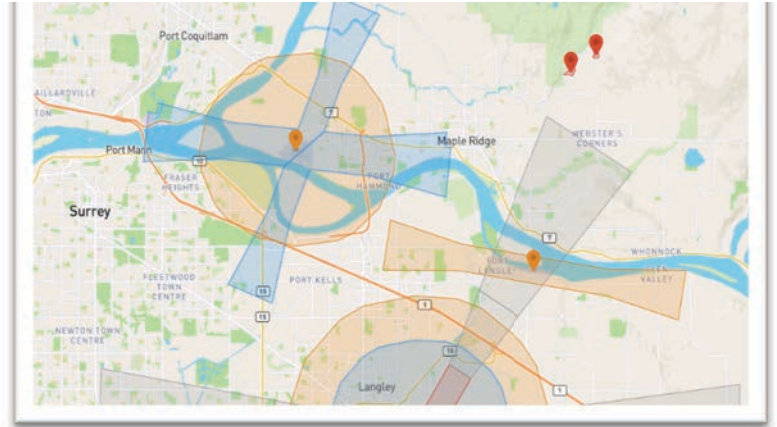
- **PPK – Aerotarget Flight**
 - AeroTargets need to have clear view of the sky
 - They must not be in the path of vehicles/machines throughout the flight
 - The target must be within your flightpath grid
 - If you're using local grid or are not covered by the Propeller Corrections Network, an AeroPoint needs to be placed on a known point.
 - The known point still needs to have a clear view of the sky and be on a flat surface (not sitting on/near a ledge).
 - If you're placing near an edge it may affect your ability to use it due to the processing software's parameters for exclusions
 - Create a known point by recording the center of the AeroPoint using a site rover (in site coordinates)
 - Measurement can be taken before or after placing the aerotarget as you can select the exact location when uploading the data
 - When processing the AeroPoint survey
 - Input the the rover recordings as the known point
 - For more information on the use of AeroPoints, visit [these articles](#)
 - Using more than one AeroPoint in your survey
 - Select the aerotarget used as GCPs
 - Select the aerotarget used as Checkpoints
 - 3D model accuracy will be largely dependent on the size of your site
 - For larger sites (>150 acres), we recommend using at least 3 Aeropoints as GCPs

4.0 Operational Tips

- In the event that the mission is not going as planned, Flip the PAF switch on the back of the controller all the way to F then back to P to cancel the operation. The aircraft will then hover
- You can initiate RTH, Fly it back, or reload the mission after correcting the issues
- Ensure a straight between take off location to first and last point are clear of any obstructions at your selected flight path altitude
- Switch Screens to live camera mode and ensure photos are being collected (the photos lag for up to 20 photos)
 - We found pressing pause then resume fixes the lag
- Use caution to not bump your yaw sticks as you will face the camera away from the Nidar position (90* down and facing in direction of travel)
- If you're noticing the aircraft doesn't stay facing forward its due to a change in angle in the camera settings. It must be set to 90*

5.0 References

- [Nav Canada Drone Request Tool »](#)
- [Drone site selection Tool »](#)
- [DJI Self Unlocking \(Blue Zones\) »](#)
- [Canada Flight Supplement \(Paid Service\)](#)
- [ForeFlight – Aviation nav. mapping tool »](#)
- [Propeller Aero - Knowledge Base »](#)
- [DJI Compass Calibration »](#)



6.0 Acronyms

- ATC** Air Traffic Control
- CFS** Canada Flight Supplement
- FSS** Flight Service Station
- PIC** Pilot in Control
- PTI** Pre Task Instruction
- TC** Transport Canada
- UAV** Unmanned Aerial Vehicle
- VFR** Visual Flight Rules
- VO** Visual Observer
- RTH** Return to home

7.0 Helpful Screenshots

Figure 2.7 – VFR Weather Minima*

AIRSPACE		FLIGHT VISIBILITY	DISTANCE FROM CLOUD	DISTANCE AGL
Control Zones		not less than 3 miles**	horizontally: 1 mile vertically: 500 feet	vertically: 500 feet
Other Controlled Airspace		not less than 3 miles	horizontally: 1 mile vertically: 500 feet	–
Uncontrolled Airspace	1 000 feet AGL or above	not less than 1 mile (day) 3 miles (night)	horizontally: 2 000 feet vertically: 500 feet	–
	below 1 000 feet AGL – fixed-wing	not less than 2 miles (day) 3 miles (night) (see Note 1)	clear of cloud	–
	below 1 000 feet AGL – helicopter	not less than 1 mile (day) 3 miles (night) (see Note 2)	clear of cloud	–

