**Flight planning software**

Priorities:

* Terrain awareness
* Map caching (ability to work without Wifi)
* Import aoi (kml, shp, etc.)
* Change battery and resume mission

*Pix 4 D capture*

1. Compatible: DJI, etc.
2. Cost: free
3. Platform: iOS and Android
4. Terrain aware / following: maybe no
5. Import shapefile / kml: kml maybe on android only, but not as easy?
6. Saving missions: maybe android only
7. Change battery and resume mission – yes

<https://support.pix4d.com/hc/en-us/community/posts/360015696423--Android-iOS-Phantom-4-Pro-multi-battery-mission-issue-cannot-resume-mission-after-tapping-Abort>

1. Notes: Can specify pattern, angle, front and side overlap and speed

*Map Pilot (Maps made easy)*

1. Compatible: for DJI, so yes phantom
2. Cost: $40 business version. $9.99 and in-app purchases (e.g., terrain awareness $9.99)
3. Platform: iOS only – works with my iphone
4. Terrain following: yes
5. Import kml: yes
6. Saving missions: yes
7. Change battery and resume mission – yes <https://support.dronesmadeeasy.com/hc/en-us/articles/206104736-Flying-Multi-Battery-Missions>
8. Notes: Mike uses this
   1. Pro: terrain following
   2. Con: limited to iOS and DJI products

*Drone deploy – Drones Made Easy*

1. Compatible: only DJI platforms. Here’s an [exhaustive list](https://support.dronedeploy.com/docs/supported-drones), including Phantom 4, many Mavic models, many Zenmuse models
2. Cost: Mission planning is free. Processing is for Pro, $99/mo if billed annually and $149/mo if billed monthly – [here’s the pricing](https://www.dronedeploy.com/pricing.html) for pro, business, and enterprise
3. Platform: iOS and Android (iOS is more stable because of the way Android handles the USB connection)
4. Terrain following: beta
5. Import shapefile / kml: yes – as free, separate app
6. Saving missions: you can make a flight template ([described here](https://support.dronedeploy.com/docs/desktopplanning)) for repeat flights
7. Change battery and resume mission – yes <https://support.dronedeploy.com/docs/flying-a-larger-area-with-multiple-batteries>
8. Notes:
   1. the DroneDeploy mobile app automatically controls the camera to tilt down in a nadir position after reaching altitude. For areas where you need to tilt the angle of your camera, such as when conducting 3D models, you will need to fly manually.
   2. Pro: Helpful user guides on website
   3. Con: expensive, only nadir camera position

*Mission planner - ArduPilot*

1. Compatible: [laundry list](http://ardupilot.org/copter/docs/common-all-vehicle-types.html) of vehicle types supported by ArduPilot
   1. No big names like DJI listed
   2. They’re still in the process of enumerating which UAVs are compatible
   3. Ready-to-use and easy-to-buy [vehicles](http://ardupilot.org/copter/docs/common-rtf.html)
2. Cost: Free
3. Platform: windows only
4. Terrain following: yes
   1. Verify height means that the Mission Planner will use Google Earth topology data to adjust your desired altitude at each waypoint to reflect the height of the ground beneath. So if your waypoint is on a hill, if this option is selected the *Mission Planner* will increase your ALT setting by the height of the hill. This is a good way to make sure you don’t crash into mountains!
5. Import kml: no, per [this forum discussion](https://discuss.ardupilot.org/t/import-of-kml-kmz-files-for-mission-planning/3506/5)
6. Saving missions: yes
7. Change battery and resume mission – perhaps
8. Notes:
   1. IRISS uses
   2. Rally points: Should an aircraft enter ‘return to launch’ and Rally Points have been defined then it will proceed to the closest Rally Point, rather than proceeding to the Home position.
   3. Ardupilot supports Copter (multi-rotor flight vehicles), Rover (ground-based vehivles), and Plane (fixed-wing flight vehicles)
   4. Pro: free, open-source

*DJI GS Pro*

1. Compatible:
   1. Cameras: DJI Mavic 2 Enterprise , Mavic 2 Enterprise Dual , Mavic 2 Pro, Mavic 2 Zoom, Mavic Pro, Phantom 3 Standard/4K/Advanced/Professional, Phantom4, Phantom4 Pro, Phantom 4 Pro V2/Advanced, Phantom 4 RTK, and Zenmuse X3, X5, X5R, X4S,X5S, Z3, Z30, XT2, and XT.
   2. Platforms: DJI GS Pro is compatible with the following DJI aerial platforms and flight controllers: Mavic 2 Enterprise, Mavic 2 Enterprise Dual, Mavic 2 Pro, Mavic 2 Zoom, Mavic Pro, Phantom 3 Standard/4K/Advanced/Professional, Phantom 4/RTK/Pro/Advanced/V2, Inspire 1/Inspire 2, Matrice 100, Matrice 200/210/210 RTK, Matrice 600/600 Pro, A3, N3
2. Cost: DJI GS Pro is free to download and users can immediately access features including Virtual Fence, 3D Map Area, and Waypoint Route. There are also additional paid features that are available through in-app purchase. Please refer to the user manual for more information.
3. Platform: Apple tablets (Android not currently supported)
4. Terrain following: it may be available as an add-on, but it isn’t mentioned in the latest edition of the user manual.
5. Import kml: yes
6. Saving missions: yes (appears you can, anyway, from the user manual)
7. Change battery and resume mission – perhaps, one can pause mission, change parameters, and resume
8. Notes:

*UgCS -maybe for LiDAR*

1. Compatible:
   1. DJI: Phantom 4/4 Pro, Phantom 3, Phantom 2, Inspire 2, Inspire 1/1 Pro/Raw, Mavic Pro/2 series, Spark, A3, N3, Matrice 600/600 Pro, Matrice 200/210/210RTK, Matrice 100, A2, Naza-M v2, WooKong-M;
   2. Ardupilot, Px4 and other MAVLink compatible multirotors, fixed wings and VTOLs;
   3. YUNEEC: H520;
   4. Mikrokopter; Micropilot; Microdrones; LockheedMartin: Kestrel, Indago
2. Cost: <https://www.ugcs.com/pricing> (not free)
3. Platform: windows/mac/linux
4. Terrain following: yes
5. Import kml: yes
6. Saving missions: not sure
7. Change battery and resume mission – yes
8. Notes:
   1. Headwall uses this

*Litchi*

1. Compatible: Mavic 2 (Zoom/Pro), Mavic (Air/Pro), Phantom 4 (Standard/Advanced/Pro/ProV2), Phantom 3 (Standard/4K/Advanced/Professional), Inspire 1 (X3/Z3/Pro/RAW), Inspire 2 and Spark
2. Cost: $24.99, $22.99 (app store costs)
3. Platform: android / iOS
4. Terrain following: yes, per <https://phantompilots.com/threads/litchi-new-terrain-following-workflow.109080/>
5. Import kml: yes, but awkward (no direct import)
6. Saving missions: yes
7. Change battery and resume mission – sounds like you need to plan separate missions
8. Notes:

*Precision flight for DJI Drones – PrecisionHawk*

1. Compatible: Phantom 3 Standard / Advanced / Professional / 4K, Phantom 4 Standard / Advanced / Pro, Mavic Pro, Inspire 1 / Pro, Inspire 2, Matrice 100, Matrice 600 / Pro, Matrice 200 Series
2. Cost: Free / Pro
3. Platform: android / iOS
4. Terrain following: yes (Pro only)
5. Import kml: yes, but awkward (no direct import)
6. Saving missions: yes
7. Change battery and resume mission – sounds like you need to plan separate missions
8. Notes: “Deploy advanced sensors, like lidar and hyperspectral”…?

*QGroundControl – ArduPilot and PX4 -* [link](https://docs.qgroundcontrol.com/en/)

1. Compatible:
2. Cost:
3. Platform: Windows, OS X, Linux platforms, iOS and Android
4. Terrain following:
5. Import kml:
6. Saving missions:
7. Change battery and resume mission:
8. Notes:
   1. GeoFences allow you to create virtual regions within which the vehicle can fly, or in which it is not allowed to fly.
   2. [Forum entry about Mission Planner vs QGC](https://discuss.px4.io/t/qgc-vs-mission-planner/3547): There is pixhawk the board and then there is the firmware you can put on the board. You can either decide to use PX4 Pro firmware or ArduPilot firmware. QGC supports both and runs on almost any OS/device. Mission Planner supports ArduPilot firmware and run on Windows (or other OS if you use Mono).