This is the print version of the latest version of the Litchi App (1/10/16) – for P3/Inspire 1 and Android.

Contents

General

Flight Modes: Use this dropdown to change the flight mode.

Radar: Shows the position of the aircraft relative to the operator's mobile device.

Flight Telemetry: Shows altitude relative to power-on elevation, distance from home point to aircraft and speed on all axis. In Follow mode, the distance between the mobile device and the aircraft is shown.

Show/hide small view: Tap to minimize the size of the small view. Tap on the small view to switch the map and video views.

Aircraft: Shows the aircraft location on the map. Tap to add a Waypoint or Point of Interest at the aircraft location.

Mobile Device: Shows the mobile device location on the map. Tap to add a Waypoint or Point of Interest at the mobile device location.

Home Point: Shows the home point location on the map. To set a new home point, drag this marker to another location. You must be flying in order to move the Home Point.

Photo/Video Switch: Use to change the camera mode.

Take Photo/Record: Tap this button to take a picture while in photo mode. Tap to start and stop recording while in video mode.

Gimbal Pitch Indicator: Shows the current position of the gimbal tilt. Top is +30° above horizon, bottom is -90°. To move the gimbal, touch the video screen, then scroll up or down (left/right also works to adjust the gimbal yaw for the Inspire 1). The faster you move your finger, the faster the gimbal speed.

Zoom to Mobile Device: Tap to zoom the map to the current mobile device location.

Unlock Map Orientation: By default the map is oriented towards North. Tap to have the map rotation continuously adjusted to match your mobile device's position relative to north.

Camera Settings: Tap to open camera settings.

Status Bar
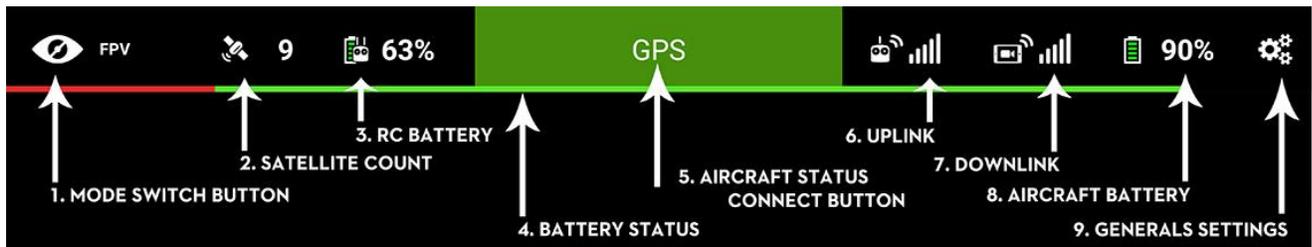
Mode Switch Button: Tap to change the flight mode.

Satellite Count: Shows the number of satellites that the aircraft is locked onto.

RC Battery: Shows the remaining RC battery percentage.

Battery Status: This bar shows the status of the aircraft battery. The part in red represents the battery required to go home.

Aircraft Status/Connected Button: Shows the current aircraft flight status. Tap this button to connect to the aircraft when it shows a red "Disconnected".

Uplink: Shows the strength of the remote controller signal. Tap to show a summary of the remote controller key bindings.

Downlink: Shows the strength of the video downlink signal.

Aircraft Battery: Shows the remaining aircraft battery percentage.

General Settings: Tap to show general settings.

Camera Settings (Android)

General camera settings as well as shooting modes (Single/Burst3-5/Timelapse) can be adjusted after a tap on the camera settings icon under the shutter/record button.

An exposure info panel is also shown at the top of the video screen when connected to the aircraft. This panel allows you to visualize and change the exposure value in automatic mode, and the shutter speed and ISO in manual mode.

In automatic mode, scroll with the remote controller's right wheel in order to change the exposure value.

To change from auto to manual mode, do a long press on the remote controller's right wheel.

Once in manual mode, you are able to change both the shutter speed and the ISO by scrolling with the remote controller's right wheel. A short press on the wheel will switch between the shutter speed and the ISO settings.

FPV

The FPV mode allows you to fly the aircraft manually using the remote controller joysticks.
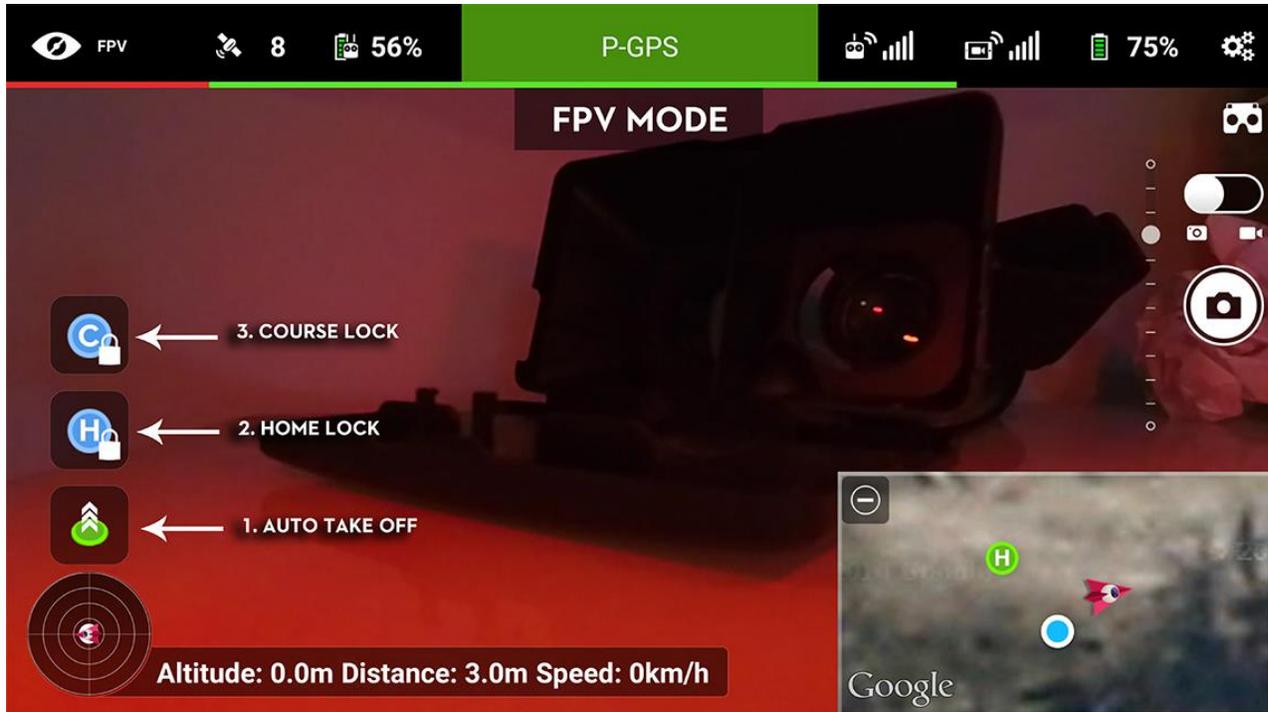
Auto Take Off: Use this to perform an automatic take off. The aircraft will then rise to 1.2m and hover.

Home Lock: When enabled, moving the right joystick down (mode 2) will bring the aircraft back to the home point regardless of its current heading.

Course Lock: When enabled, moving the right joystick up/down (mode 2) will move the aircraft forward/backward in the direction defined by its heading at the time Course Lock was enabled.

Ground Station / Waypoints

Litchi's Ground Station mode allows you to setup classic waypoint missions as well as advanced camera moves such as Selfies and Cable Cams.

Place multiple waypoints on a map however far you want and the aircraft will fly from waypoint to waypoint and complete the mission even if the signal is lost.

The maximum aircraft speed in this mode is 15m/s (no wind).

Enter the Ground Station mode by pressing the Flight Mode icon at the top left of the Litchi screen. Select "GS". You can then start editing missions.

Go Home: Tap to trigger Return to Home.

Start/Pause/Resume Mission: In edit mode, tap this button to show the pre-flight report and then start the mission. While in a mission, this button will allow you to pause and resume the waypoint mission.

Mission Settings: Tap this button to display the mission settings.

Save Mission: Tap this button to save a mission. Missions are saved in the "LitchiApp/missions" folder located in the mobile device's internal storage.

Load Mission: Tap this button to load a previously saved mission.

Add Point of Interest: Toggles the Point of Interest mode. When on, a click on the map will add a Point of Interest.

Drawing Tool: Toggles the drawing tool. When on, you will be able to draw a path of waypoints on the map.

<u>Clear All</u>: Tap to reset everything in the editor.

<u>Mission Info</u>: Shows general mission information. In edit mode, the total distance and time will be shown. During a mission, the "target" waypoint number will be shown, as well as the current state of the aircraft.

Mission Settings

<u>Heading Mode</u>: Defines the heading of the aircraft during the mission. Choose between "Toward next Waypoint" ("Auto" on iOS) where the aircraft will point toward the next waypoint, "Initial Direction" ("Initial" on iOS) where the aircraft will keep the heading it has when the mission is started, "User Controlled" ("Manual" on iOS) where you are able to control the heading of the aircraft during the mission using the left joystick left/right (mode 2) or "Waypoint Defined" ("Custom" on iOS) where the aircraft will use the heading defined at each waypoint. Using "Waypoint Defined" ("Custom" on iOS) also means that the aircraft will smoothly transition from one waypoint's heading to the next.

<u>Finish Action</u>: Choose an action that the aircraft will perform at the end of the mission. Available choices are "None", "Go Home" ("RTH" on iOS), "Land" and "Back to First Waypoint" ("Back to 1st" on iOS).

<u>Path Mode</u>: Choose between "Straight Lines" where the aircraft will go straight to each waypoint then turn, or "Curved Turns" where the aircraft will not stop at waypoints and instead take curved turns (how large the curved turns are depends on each waypoint's curved size setting).

<u>Cruising Speed</u>: Defines the autonomous flight speed of the aircraft. If you do not use the remote controller's right joystick (mode 2) during the mission, the maximum speed the aircraft will travel at is the cruising speed. Can be set to negative values if you want the aircraft to travel backwards autonomously.

<u>Remote Controller Speed</u>: The difference between the remote controller speed and the cruising speed is the amount of speed that you can add on top of the cruising speed, using the remote controller's right joystick (mode 2). The remote controller speed should be set to a value that is equal or higher than the cruising speed.

<u>Default Curve Size</u>: When adding a new waypoint, the previous waypoint's curved size will be set to the "default curve size percentage" of the minimum length available on both adjacent sides of the waypoint.

<u>Default Gimbal Pitch Mode</u>: Default Gimbal Pitch Mode to be used for newly added waypoints.

<u>Rotations Direction</u>: When set to Managed, aircraft rotations from waypoint to waypoint will always use the shortest direction (clockwise/anticlockwise).

Waypoints

To add a waypoint, tap anywhere on the map (make sure that the POI toggle is not on). You can add up to 99 waypoints.
To view the waypoint settings, tap the waypoint itself. To drag a waypoint, do a long press on the waypoint, then move it around.
To delete a waypoint, tap the waypoint to open its settings, then tap the minus icon at the top left corner of the waypoint settings window.
To insert a waypoint between two consecutive waypoints, tap the first waypoint of the two to open its

settings, then tap the plus icon at the top left corner of the waypoint settings window. A waypoint will then be inserted between this waypoint and the next, it will be placed exactly in the middle of these two waypoints.

Waypoint Settings

<u>Altitude</u>: The altitude of the waypoint relative to the elevation of the aircraft where it was powered on.

<u>Curve Size</u>: Defines the size of the curved turn at this waypoint. A bigger size means the aircraft will start the turn earlier while travelling to this waypoint. This setting only applies when the mission setting "Path Mode" is set to "Curved Turns". It also does not apply to the first and last waypoints as there are no turns at these waypoints.
`Info` The path of the curve is drawn in turquoise on the map. It will update dynamically as you adjust the curve size setting.

<u>Heading</u>: The direction relative to north in which the aircraft will look at when arriving at this waypoint (0° is North, 90° is East). This setting only applies when the mission setting "Heading Mode" is set to "Waypoint Defined" ("Custom" on iOS). If two consecutive waypoints have different headings, the aircraft will smoothly transition from one heading to the other while travelling from the first waypoint to the second.
`Info` The waypoint heading is represented by the blue aircraft icon on top of each waypoint. It will update dynamically as you adjust the heading setting.

<u>Rotation</u>: When two consecutive waypoints have different headings, the aircraft will smoothly rotate from the first heading to the next. This setting defines the direction in which the aircraft will rotate, clockwise or anti-clockwise.

<u>Gimbal Pitch</u>: Choose between "Disabled" where the gimbal pitch control will be manual, "Focus POI" where Litchi will automatically control the gimbal pitch to keep the selected POI in the center of the frame (blue markers), or "Interpolate" where you can specify the gimbal pitch angle at this waypoint. For "Interpolate" to work, the previous or next waypoint need to be set to "Interpolate" as well. Litchi will then automatically adjust the gimbal pitch angle to start and end at the specified angles, and smoothly transition while travelling between the two waypoints.

<u>POI</u>: Use this setting to change which POI a waypoint will focus on. By default, when adding a waypoint it will focus on the nearest POI, if there is one.

<u>Actions</u>: Each waypoint can have up to 15 different actions (more details below).

Waypoint Actions

Actions are performed when the aircraft arrives at the waypoint. There are six different waypoint actions, three of which accept an additional parameter.
You can add up to 15 different actions for each waypoint. Waypoint actions can be repeated by increasing the "Repeat" number. Setting repeat to 1 (default) means that all actions will be done once.
`Important` Waypoint actions are ignored when the mission "Path Mode" is "Curved Turns" as the aircraft will not stop at waypoints then.

<u>Stay for</u>: The time in seconds that the aircraft should pause at the waypoint.

<u>Take Photo</u>: The camera will take one picture. For this action to work, recording must of off.

<u>Start Recording</u>: The camera will start recording.

<u>Stop Recording</u>: The camera will stop recording.

<u>Rotate Aircraft</u>: The aircraft will rotate to the specified angle. The parameter is the angle relative to North that the aircraft should rotate to (0° is North, 90° is East). For example, setting it to 270° means that the aircraft will rotate to point towards West. If the aircraft is already pointing West before starting this action, it will not rotate at all.

<u>Tilt Camera</u>: The gimbal will move to the specified angle (tilt). The valid value range is +30° above horizon to -90° (look down).

Panorama Preset
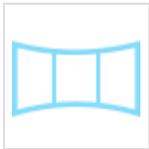
A tap on the small white icon next to the action settings of each waypoint will automatically add the necessary actions for a full 360° panorama made up of 7 photos (51° angle variation).
`Important` Ensure that the aircraft is not recording when it arrives at a waypoint for a panorama as the preset will not stop recording automatically.

Point of Interests
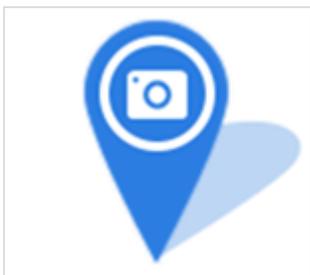
Placing Point of Interests (POI) on the map allows you to easily set up the orientation the aircraft will have during the mission when the mission "Heading Mode" is "Waypoint Defined" ("Custom" on iOS). Additionally, Point of Interests also enable the use of the "Focus POI" waypoint gimbal setting.
To enter POI edit mode, tap the POI toggle located in the top right corner of the map. When this button is enabled, tap anywhere on the map to place a POI.

When adding a new POI, all waypoints for which the newly-added POI is the nearest will have their heading setting adjusted in order to target the POI.
To drag a POI, do a long press on the POI, then move it around. This will automatically adjust the heading setting of the waypoints that are currently targetting the POI.
To view the POI settings, tap on the POI. You will be able to adjust the POI's altitude which is used for the

"Focus POI" waypoint gimbal setting.
To delete a POI, while the POI settings window is displayed, tap on the top left corner trash icon. Deleting a POI will automatically reassign nearest POIs for waypoints which had the now-deleted POI in target.

Waypoint Gimbal Pitch

Litchi can control the gimbal pitch automatically during the mission, as long as the aircraft is within range of the remote controller. To specify how the gimbal pitch should be controlled, each waypoint has a Gimbal Pitch setting which can be one of the following:

<u>Disabled</u>: The gimbal pitch control will be manual from this waypoint.

<u>Focus POI</u>: Litchi will automatically control the gimbal pitch from this waypoint to the next to keep the selected POI in the center of the frame. The POI altitude will be taken into account to determine the gimbal pitch angle.

<u>Interpolate</u>: You can specify the gimbal pitch angle at this waypoint. For "Interpolate" to work, the previous or next waypoint need to be set to "Interpolate" as well. Litchi will then automatically adjust the gimbal pitch angle to start and end at the specified angles, and smoothly transition while travelling between the two waypoints.

Drawing Tool

The drawing tool allows you to quickly setup a waypoints mission, simply draw the path you want the aircraft to follow!
To enter the drawing mode, tap the pencil icon located in the top right corner of the map. Then, draw the mission path on the map.

When you are done, lift your finger from the screen and a Batch waypoint settings window will appear, use it to set global settings for the waypoints that will be created from the drawn path.
In this window, you will find an additional setting, the "Waypoing Spacing" which is the minimum distance between the waypoints that will form the drawn path. Slide all the way to the left to select "Optimized" which will automatically determine the minimum amount of waypoints required to form the drawn path.

Loading / Saving a mission

Missions can be planned anywhere, you do not need to be connected to the aircraft in order to plan a mission.
To save a mission, tap the save button in the left button bar. Enter a filename, click Ok and the mission will then be saved in the "LitchiApp/missions" folder located in the mobile device's internal storage.
To load a mission, tap the load button in the left button bar, select the mission then click load.

Running a mission

Press the "Play" button located in the left button bar to show the mission preflight report. If the mission is valid, you will be able to tap the Go button in the report window to start the mission.
<mark>Important</mark> When initiated the aircraft will first rise to 6m altitude if it is below that threshold, then proceed to the first waypoint in a direct path. Make sure there are no obstacles between the aircraft's initial location and the first waypoint.
If the aircraft is grounded when starting a mission, it will only take off if the 'automatic take off' general setting is enabled.

Pausing a mission

Pausing a mission can be done by tapping on the pause button in the left bar.

Stopping a mission

Stopping a mission can be done by switching the RC switch from "F" to "P".

Cookbook

Cable Cam - *by Chris*

1. Interpolate Method

General Settings

Set Custom Button 1 to "Waypoint at Aircraft"

Mission Settings

Set Cruising Speed to 0 and RC Speed to the highest speed you want the aircraft to travel.

Set Default Gimbal Pitch to "Interpolate"

Steps

Fly the Phantom to the Waypoint 1 location, set your heading, and Gimbal Pitch, and press Custom Button 1.

Fly the Phantom to the Waypoint 2 location, set your heading, and Gimbal Pitch, and press Custom Button 1.

Run the mission.

Note : Rotation defaults to the shortest path but can be modified in Mission Settings.

2. POI Method

General Settings

Set Custom Button 1 to "Waypoint at Aircraft"

Set Custom Button 2 to "POI at Aircraft"

Mission Settings

Set Cruising Speed to 0 and RC Speed to the highest speed you want the aircraft to travel.

Set Default Gimbal Pitch to "Focus POI"

Steps

Fly the Phantom to the Waypoint 1 location and press Custom Button 1.

Fly the Phantom to the POI location associated with the Waypoint 1 and press Custom Button 2

Fly the Phantom to the Waypoint 2 location and press Custom Button 1

Fly the Phantom to the POI location associated with the Waypoint 2 and press Custom Button 2

Run the mission.

Note : Rotation defaults to the shortest path but can be modified in Mission Settings.

Selfie - *by Chris*

Introduction

Selfies are video recordings of a subject, typically yourself, in which the recording starts with a close-up of the subject and zooms out as the aircraft moves away from the subject, while keeping the camera focused on the subject.

There are several methods to doing a selfie. It can be done manually in FPV mode by simply hovering the aircraft in front of the subject while focused on the subject and then flying the aircraft backwards and up at the same time. This method works fine but may not maintain the subject in the center of the shot.

Doing a Selfie in GS Mode

Set up Mission Parameters as desired

Set Default Waypoint Gimbal Pitch to "Focus POI"

Set Cruising Speed to 1. This is extremely important since that is the speed that the aircraft will fly as it tries to find the 1st WP.

Set RC Speed to the max speed you want for the selfie.

Set up Waypoints

Start up and fly your aircraft to where you want the selfie to begin at least 10 meters away from people,

Add a waypoint by one of the two following methods.

Deselect the Add POI Button (if it is selected) and press the aircraft icon in the map view or

Press a Custom Button that has been set to "Waypoint at Aircraft"

Fly your aircraft to where you want the selfie to go next, and add another waypoint.

Repeat this for as many waypoints as you want, always remembering to point the aircraft towards you and framing yourself in the video feed.

Fly the aircraft back toward the start of the selfie mission.

Set up POI. This will focus all your waypoints on yourself or any subject for that matter.

Place a POI at your location in one of the two following methods

Press the Add POI button and press the blue dot, which represents the location of the RC, on the map screen or

Press a Custom Button that has been set to "POI at Device".

Run the mission

Remember to push the RC switch to P to cancel the mission.

Press Run.

Use the RC Pitch Stick (Forward/Back) to control the speed of the aircraft.

Follow

Follow mode is only available on Android at this time.

Follow causes the aircraft to follow the movements a subject.
The subject is usually the mobile device that is connected to the Remote Controller (RC) but it can also follow a pin on a map or a second mobile device running the Litchi Magic Leash app.
The maximum aircraft speed in this mode is 16.7m/s (no wind).

Warning It is advisable to only use the Follow feature in wide open areas.

Enter the Follow mode by pressing the Flight Mode icon at the top left of the Litchi screen. Select "Follow".
Press the Follow Settings icon on the left side of the screen.
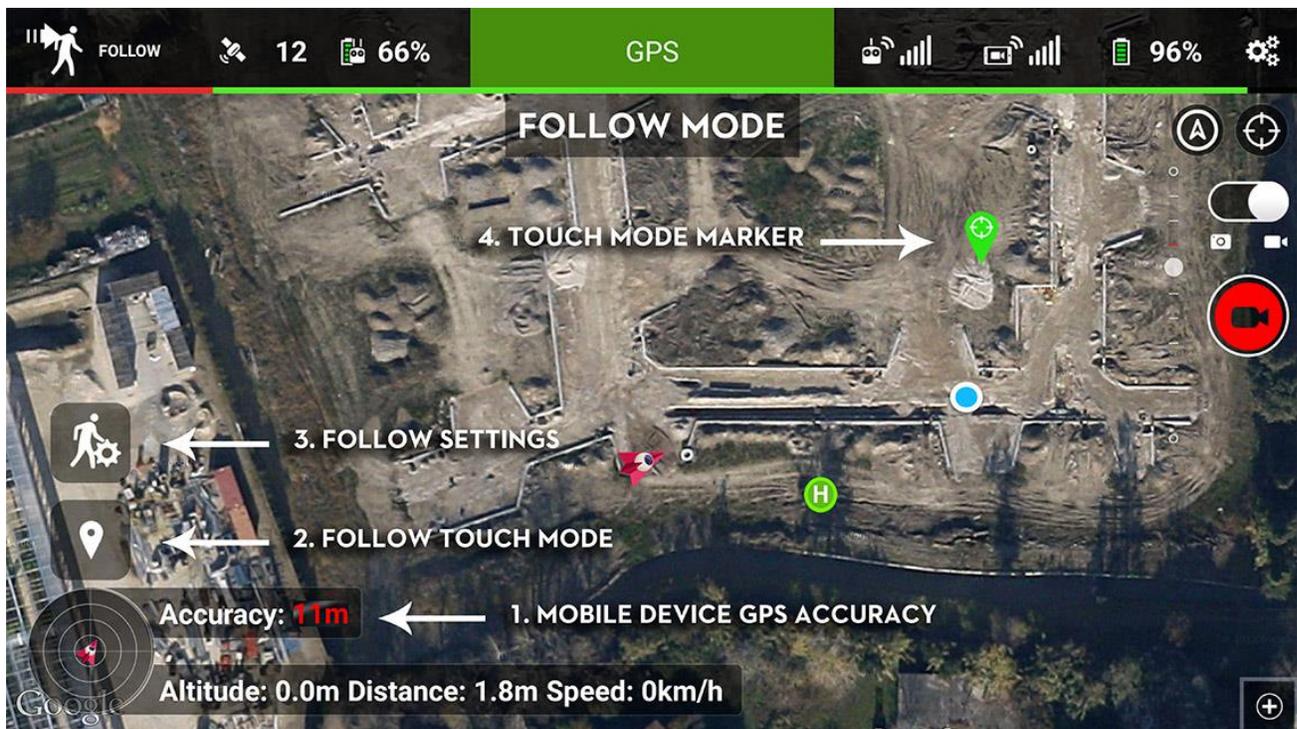
Mobile Device GPS Accuracy: The estimated accuracy of your mobile device's location, in meters/feet. If you draw a circle centered at your mobile device's location, and with a radius equal to the accuracy, then there is a 68% probability that the true mobile device's location is inside the circle. If this number is red, it means your current location accuracy is over the minimum location accuracy general setting. In such a case, you will not be allowed to start Follow. If you are having difficulties getting a good location accuracy, try another area, try another mobile device, or increase the "Location Accuracy" general setting. Setting the "Location Accuracy" to a higher value will allow for a bigger margin of error for the mobile device GPS signal, but the follow me movements may be less precise.

Follow Touch Mode: Tap to toggle the Follow Touch mode. In this mode, the aircraft will follow the Touch mode marker instead of the mobile device.

Follow Settings: Tap to display the follow settings (more details below).

Touch Mode Marker: When the Follow Touch Mode is enabled, tap anywhere on the map to set this marker, which the aircraft will follow. The marker is also draggable.

Follow Settings

For Follow to work, the app needs to know the position of the subject in relation to the aircraft. The easiest way to set these relative values is to fly the aircraft at the relative position the aircraft should be in when the subject begins to move, and press the "Set from Aircraft Position."
All settings except "Altitude Reference" can be altered in real-time.

Set from Aircraft Position: Sets the relative altitude, distance and heading from the aircraft's current position.

Altitude: The altitude from which the aircraft should follow the subject.

Distance: The distance from which the aircraft should follow the subject.

Heading Mode (North/Course - North by default): Heading mode "North" means that the aircraft will point its nose to the angle you set relative to North. For example if you set it to 0, the nose will point to North while keeping the subject in the center of the frame. Heading mode "Course" means that the aircraft will point its nose to the angle you set relative to the subject's course (only works if the subject is moving faster than 1m/s). For example if the heading is set to 0 (Leash), the aircraft will follow the subject from behind. Likewise if you set the heading to 180degree (Lead), the aircraft will follow the subject from the front.

Heading: The angle from which the aircraft should follow the subject (the reference is defined by the Heading Mode).

Gimbal Control (auto/manual - auto by default): When set to automatic (auto), causes the gimbal to point at the subject automatically. If the option is set to manual, the user will be required to control the gimbal manually.

Subject Height: The height of the subject that the camera should point at.

Subject Offset: Only change this setting in situations where you want the aircraft to follow the subject's movements while looking in another direction relative to the subject. The default 0 degrees causes the aircraft to face the subject. An offset of 180 degrees will cause the aircraft to face completely away from the subject.

Altitude Reference (Power-on Elevation/Mobile Device Elevation - Power-on Elevation by default): When set to Power-on Elevation, the aircraft will fly at the altitude set relative to the elevation where the aircraft was powered on. When set to Mobile device elevation, the aircraft will fly at the altitude set relative to the mobile device elevation which means it will continuously adjust its altitude as the subject moves up or down in altitude (for example if the subject moves up a hill). Mobile Device Elevation is only available if your mobile device has a pressure sensor.
Important When using Mobile Device Elevation, Litchi expects you to start the Follow session with a power-on elevation similar to the mobile device's current elevation. If the aircraft is already in the air, ensure that it was powered on at an elevation similar to the mobile device's current elevation.

RC Joystick **(enabled/disabled - disabled by default)**: When on, you are able to adjust the altitude using the left joystick up/down, the distance using the right joystick up/down, and the follow heading using the left joystick left/right. The follow heading is the heading of the aircraft relative to the subject, so moving the left joystick to the right and holding it there will result in the aircraft doing an orbit around the subject in a clockwise direction.

Horizontal Movements **(enabled/disabled - enabled by default)**: When set to off, horizontal movements will be disabled and only the aircraft's altitude, yaw and gimbal will be controlled by Litchi. This can be useful to simulate a fixed camera in the sky.

Running a Follow session

Press the "Follow" button at the bottom of the settings screen to initiate a Follow session. The Follow button will change to a Pause button that can be used to pause the Follow session.
When initiated the aircraft will first rise to 4m altitude, then proceed to the designated relative position as indicated in the settings. It will then move as the subject moves.
If the aircraft is grounded when starting Follow, it will only take off if the 'automatic take off' general setting is enabled.

Stopping Follow

Stopping a Follow session can be done by switching the RC switch from "F" to "P".

Litchi Magic Leash

Download Litchi Magic Leash on the Play
Store: https://play.google.com/store/apps/details?id=com.flylitchi.lml
Or Download Litchi Magic Leash on the Apple Store: https://itunes.apple.com/gb/app/id1031764016
Litchi Magic Leash allows the subject of the Follow mode to be a different mobile device from that which is connected to the RC. In other words the aircraft will follow a mobile device that is not connected to the RC. Both mobile devices must be connected to the internet for Magic Leash to work.

Warning At this time, Litchi Magic Leash does not transfer pressure data. This means that if you go up or down a hill using Litchi Magic Leash, the aircraft will not adjust its altitude.

Follow these steps in order to setup Litchi Magic leash (mobile device connected to RC is device A, second device is B):

On device A, start Litchi, connect to the aircraft, switch to Follow mode, and tap the Magic Leash Button (top left corner of Follow settings) to connect, then remember the PIN code that pops up

On device B, start Litchi Magic Leash, tap the Magic Leash icon to connect, then enter the PIN code from step 1

Your two mobile devices are now paired. Start the Follow session on device A.

The following video explains how to use Magic Leash: https://youtu.be/Xwyw3LDkQ-w

Orbit

Platforms Orbit mode is only available on Android at this time.

Orbit causes the aircraft to circle around a point of interest while optionally having the gimbal keeping focus on it.

The orbit parameters (radius, altitude, speed) can be altered in real-time.

Enter the Orbit mode by pressing the Flight Mode icon at the top left of the Litchi screen. Select "Orbit".
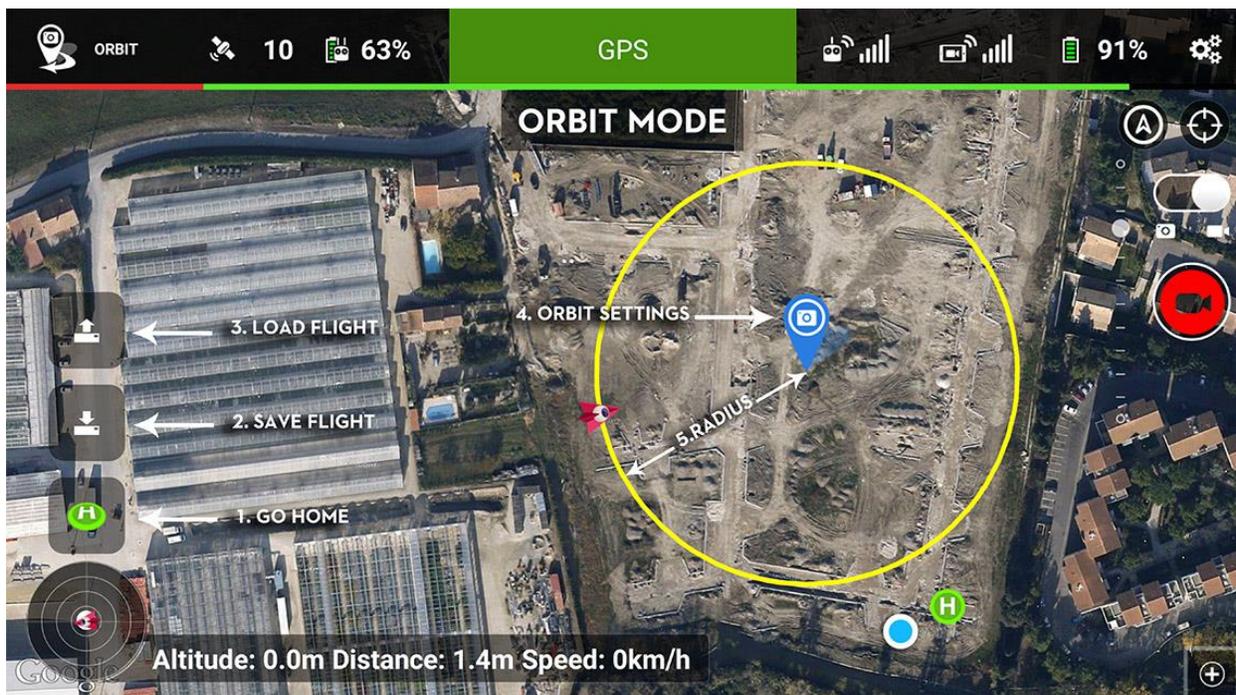
<u>Go Home</u>: Tap to initiate Return to Home at any time.

<u>Save Flight</u>: Tap to save the current Orbit parameters.

<u>Load Flight</u>: Tap to load a previously saved Orbit flight.

<u>Orbit Settings</u>: Tap the point of interest marker to bring up the Orbit settings window (details below).

<u>Radius</u>: The orbit circle is displayed on the map with a yellow line. It is updated in real-time if you change it during an Orbit session.

Orbit Settings

To bring up the Orbit settings window, place a point of interest marker on the map, then tap on it.

<u>Altitude</u>: The altitude at which the aircraft should orbit. Can be changed in real-time using the left RC joystick up/down (mode 2).

<u>Radius</u>: The distance from which the aircraft should orbit from the point of interest. Can be changed in real-time using the right RC joystick (mode 2). Push the joystick up to reduce the radius, or push it down to increase the radius.

<u>Speed</u>: The speed at which the aircraft should orbit in degrees per second. The maximum selectable speed will vary depending on the selected radius. Can be changed in real-time using the right RC joystick (mode 2). Push the joystick to the right to increase the clockwise speed, push it to the left to increase the anti-clockwise speed.

<u>Entry Point</u>: The point on the circle where the aircraft will start orbiting. Please note that the map is orientated towards North by default.
`Important` Make sure there are no obstacles between the entry point and the initial position of the aircraft.

<u>Heading Mode</u>: Defines the orientation of the aircraft while orbiting. Can be set to "Center", "Along the circle (Forward)", "Along the circle (Backwards)", "Outwards" or "User Controlled". The heading can be changed in real-time using the left RC joystick (mode 2). Push the joystick to the left to turn left, and to the right to turn right.

<u>Direction</u>: Defines the orbit direction, clockwise or anti-clockwise.

<u>Gimbal Control</u> **(auto/manual - auto by default)**: When set to automatic (auto), causes the gimbal to point at the orbit center automatically. If the option is set to manual, the user will be required to control the gimbal manually.

<u>Subject Height</u>: The height of the orbit subject that the camera should point at. If Gimbal Control is set to auto, use the RC's gimbal wheel to adjust to subject height during an Orbit session.

Running an Orbit session

Press the "Start" button at the bottom of the settings screen to initiate an Orbit session.
When initiated the aircraft will first rise to the preset altitude, then proceed to the entry point on the Orbit circle. It will then start orbiting.
If the aircraft is grounded when starting Orbit, it will only take off if the 'automatic take off' general setting is enabled.

Stopping Orbit

Stopping an Orbit session can be done by switching the RC switch from "F" to "P", or by tapping on the stop button in the left bar.

Failsafe

If signal is lost between the aircraft and the remote controller, the aircraft will continue the Orbit session until it reaches the critical battery level (can be set in DJI Go). It will then land in place automatically, even if your failsafe is Return to Home.

Virtual Reality

VR mode is only available on Android at this time.

Available in all flight modes, the VR mode immerses you into a real First Person View, the video stream appears right in front of your eyes!
You also have the ability to control the gimbal by moving your head.

By harnessing the power of your mobile phone, the VR mode brings you the most immersive FPV experience at less than a quarter the cost of the least expensive FPV glasses solution.

To start VR mode, tap on the goggles icon located the top right corner of the video screen.
The VR mode requires the use of a phone together with external mobile VR goggles. Litchi is compatible with most VR goggles.
Below are some recommendations:

Freefly VR

Homido

Durovis

Google Cardboard

Gear VR (for Samsung supported devices only, may require drilling a hole or removing the USB port to bypass the Oculus app)

It is highly recommended to get a pair of goggles with a headstrap, not all of them comes with one.

The VR mode uses the phone's hardware video decoder for improved performance and while it will work on most devices, we do not guarantee support for all Android devices. Software video decoding is not supported for the VR mode, you can change the video decoder in the general settings.

The VR mode brings you into another world, be aware of your surroundings as you will not be able to see your aircraft.
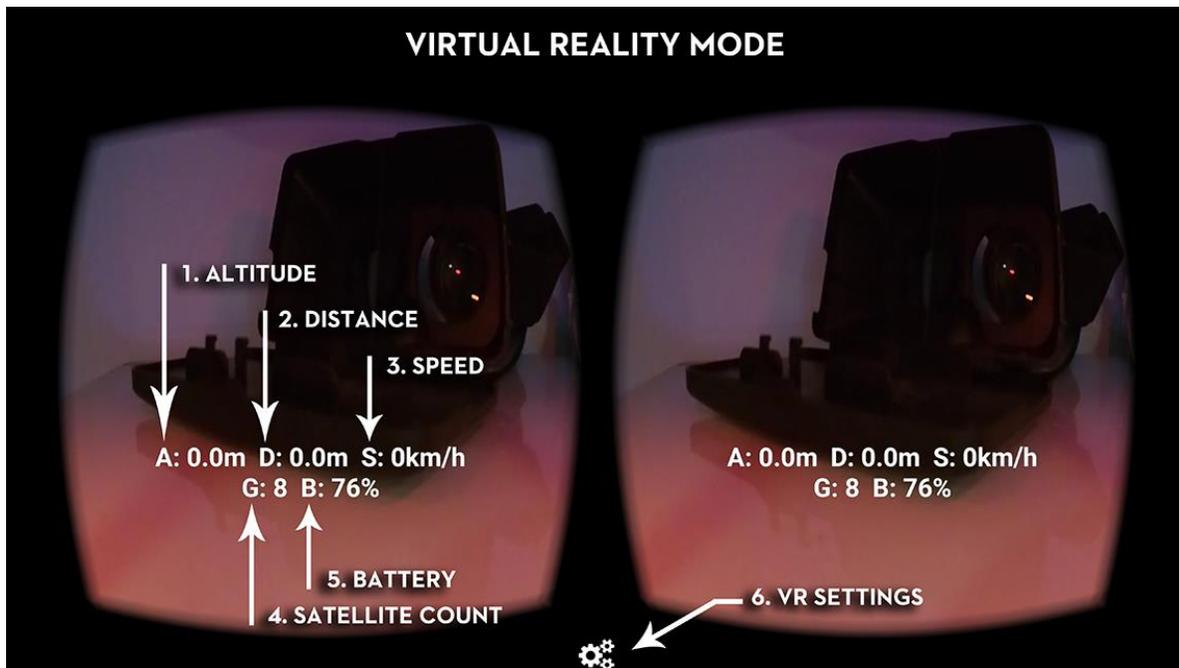
Altitude: Displays the altitude of the aircraft relative to the elevation where it was powered on.

Distance: Displays the distance from home point to aircraft. In Follow mode, displays the distance between the mobile device and the aircraft.

Speed: Displays the current aircraft speed.

Satellite Count: Shows the number of satellites that the aircraft is locked onto.

Battery: Shows the remaining aircraft battery percentage.

VR Settings: Tap to bring up the VR settings (more details below).

VR Settings

Exit VR: Tap this button to exit VR mode.

Display OSD: Turn this on to display the On-Screen Display (altitude, distance, speed, etc.).

Text Depth Offset: Increase or Decrease the OSD text depth offset to make it more comfortable to read.

Head Tracking: Turn this on to enable moving the gimbal using head movements.

Gimbal Speed: Defines how responsive the gimbal will be to your head movements. A higher value means it will move faster.

**Aspect**: Two video aspect ratios are available. 16:9 or 8

Focus

Focus allows you to easily keep a subject (Point of Interest or Mobile Device) in the video frame while flying the aircraft manually.
The gimbal pitch angle is controlled by Litchi as well as the gimbal yaw for Inspire 1.
You can also enable automatic aircraft rotation control (yaw) which makes it very simple to keep the subject in the frame even with the Phantom 3 which does not have gimbal yaw capabilities.
Focus is compatible with Litchi Magic Leash, making it possible to focus on an external mobile device!
Enter the Focus mode by pressing the Flight Mode icon at the top left of the Litchi screen. Select "Focus".

Focus Settings: Tap to bring up the Focus settings window (details below).

Point of Interest: The point of interest marker.

Forward/Backward Axis: Represents the "Joystick Reference" pitch axis along which the aircraft course is locked. Shown when "Aircraft Yaw" is enabled and a custom "Joystick Reference" is selected.

Left/Right Axis: Represents the "Joystick Reference" roll axis along which the aircraft course is locked. Shown when "Aircraft Yaw" is enabled and a custom "Joystick Reference" is selected.

Focus Settings

Subject: Choose between Point of Interest (to be placed on the map) or Mobile Device.

<u>Subject Height</u>: The height of the subject that the camera should point at. You can also use the RC's gimbal wheel to adjust to subject height while in flight.

<u>Aircraft Yaw</u>: When enabled, Litchi will control the yaw (rotation) of the aircraft. Recommended for Phantom 3 users.
<mark>Warning</mark> There is a tiny amount of lag with joystick controls when this setting is enabled, use carefully. Additionally, when Aircraft Yaw is enabled, the aircraft is effectively in ATTI mode, expect some horizontal drift and avoid using in high winds.

<u>RC Mode</u>: Use this setting to change the RC mode to your preference (joystick functions). Most users will want to leave this on the default RC mode 2.
Note that this will not change the real RC mode that can be set in DJI Go, this setting only applies to the Focus session. Refer to the aircraft manual for more information on RC modes. Only applies when Aircraft Yaw is enabled.

<u>Joystick Reference</u>: Choose between "Default" (joysticks respond as normal), "Aircraft Heading" (course is locked based on current aircraft heading, similar to Course Lock, can be changed in real-time using RC yaw sitkc and can be reset using C1/C2 "Course Lock" custom function), "Mobile Device Orientation" (course is locked based on your mobile device orientation), "Home-Aircraft Bearing" (course is locked based on the bearing between the home point and the aircraft location) and "Mobile Device-Aircraft Bearing" (course is locked based on the bearing between the mobile device and the aircraft location). For each option except "Default", axes will be drawn on the map for reference, the large magenta axis is the pitch axis (forward/backward) while the small blue axis is the roll axis (left/right). Only applies when Aircraft Yaw is enabled.

<u>Joystick Speed Modifier</u>: Use this setting to slow down the overall speed of the aircraft. Keep in mind that when Aircraft Yaw is enabled, the aircraft is flying in ATTI mode, low values for this setting will often not be practicable as the maximum speed may then become too slow to overcome wind forces. Only applies when Aircraft Yaw is enabled.

Running a Focus session

If your subject is a Point of Interest, place it on the map before starting the session.
Then, press the "Start" button at the bottom of the settings screen to initiate a Focus session.

Stopping Focus

Stopping a Focus session can be done by switching the RC switch from "F" to "P", or by tapping on the stop button in the Focus settings screen.

Litchi Magic Leash

Download Litchi Magic Leash on the Play
Store: https://play.google.com/store/apps/details?id=com.flylitchi.lml
Or Download Litchi Magic Leash on the Apple Store: https://itunes.apple.com/gb/app/id1031764016
Litchi Magic Leash allows the subject of the Focus mode to be a different mobile device from that which is

connected to the RC. In other words the aircraft will focus on a mobile device that is not connected to the RC. Both mobile devices must be connected to the internet for Magic Leash to work.

Follow these steps in order to setup Litchi Magic leash (mobile device connected to RC is device A, second device is B):

On device A, start Litchi, connect to the aircraft, switch to Focus mode, and tap the Magic Leash Button (top left corner of Focus settings) to connect, then remember the PIN code that pops up

On device B, start Litchi Magic Leash, tap the Magic Leash icon to connect, then enter the PIN code from step 1

Your two mobile devices are now paired. Start the Focus session on device A.

Panorama

Panorama mode is only available on Android at this time.

The Panorama mode allows you to easily shoot 360° horizontal and spherical panoramas.
Enter the Panorama mode by pressing the Flight Mode icon at the top left of the Litchi screen. Select "Panorama".
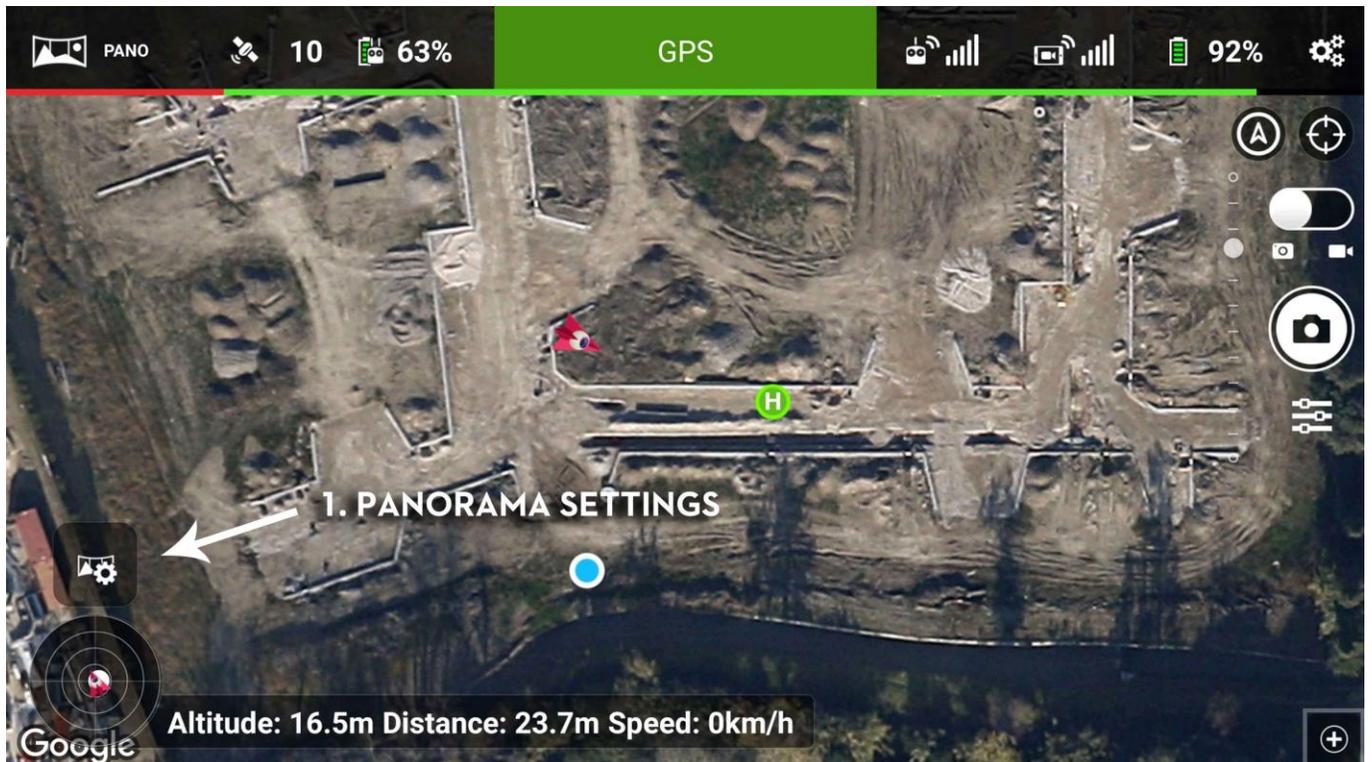
Panorama Settings: Tap to bring up the Panorama settings window (details below).

Panorama Settings

Mode (Inspire 1 only): Choose between Aircraft Rotation or Gimbal Rotation.

Type: Choose between "Horizontal" (one row at 0°), "Spherical 2 Rows" (2 rows at 0°/-45°), "Spherical 3 Rows" (3 rows at 0°/-30°/-60°) or "Spherical Custom" where you can specify each row's angle manually from -90° up to +30° if you have the extended gimbal range (can be set in DJI Go for Phantom 3 users).
All Spherical panoramas also take 2 additional photos at -90°.

Photos per Row: The number of photos that the aircraft should take for each row.

Wait Time before each Photo: Additional time that the aircraft waits before taking each photo, helps stabilization. Only available for custom Panoramas.

Wait Time after each Photo: Additional time that the aircraft waits after taking each photo, helps stabilization. Only available for custom Panoramas.

Running a Panorama session

Fly the aircraft to the location you want to take the panorama, then press the "Start" button at the bottom of the settings screen to initiate the session.
`Important` Unless you are using an Inspire 1 with the mode "Gimbal Rotation", make sure there is enough vertical space (±3m) as the aircraft will move up and down slightly during the panorama session.

Stopping Panorama

Stopping a Panorama session can be done by switching the RC switch from "F" to "P", or by tapping on the stop button in the Panorama settings screen.

Processing a Panorama

Here is a non-comprehensive list of software you can use to stitch the photos together and create a panorama:

PTGui

Image Composite Editor

Autopano

Easypano

Hugin

Settings

General

Aircraft Type: Use to swap aircraft type between Phantom 2 Vision (+), Phantom 3 Pro, Phantom 3 Advanced and Inspire 1.

Units: Use to switch between Metric or Imperial units.

Show Battery Voltage: When enabled, shows the lowest aircraft battery cell voltage under the battery percentage.

Show GPS Coordinates: When enabled, shows the current latitude and longitude of the aircraft next to the altitude, distance and speed indicators at the bottom left of the screen. In addition, when enabled this setting allows you to edit waypoint coordinates in GS mode.

Map Type: Use to switch between Standard (no imagery), Satellite (imagery) and Hybrid (imagery + street names).

Map Auto Zoom: Enable/disable map auto zoom.

Map Safe Area Radius: When not 0, a red circle will be drawn on the map to represent a safe distance area. Note that this is only a visual help and will not limit you in any way should you wish to go out of the bounds of this circle.

Find My Aircraft: Tap to enter a map screen which will display the last known location of your aircraft.

Reset All Settings: Tap to reset all settings. Requires a restart.

Help: Tap to view this help page. Requires an Internet connection to access the first time. After that, it will be cached for offline use.

Language: Changes the language of the application. Requires a restart.

Camera

Auto Record: Enable/distance Auto recording. Auto record starts/stops when motors start/stop.

Video Format: Choose between MOV and MP4. This setting affects the format of the video stored on the aircraft SD card. Requires aircraft connection in order to change.

Show Camera Controls: Show/hide camera controls.

Grid Lines: Show/hide grid lines on the video screen, useful to help framing a shot.

Preview Quality: Select the quality of the video stream from 4/6/8/10 Mbps. Recommended to use a low quality on lower end devices.

Video Decoding: Choose between Hardware, Hardware (Android 6.0) or Software. Software is default, but Hardware is recommended. The Virtual Reality mode only works using one of the 2 Hardware decoders, and

generally the Hardware decoder will have better performance. Please note that the hardware decoder may not work for all devices. If you are using Android 6.0 and are having issues with the default Hardware video decoder, try switching to the Hardware (Android 6.0) video decoder.

Transmission Channel: Select a transmission channel between 0 to 31, or auto. On auto, the channel will be selected automatically.

Double Output (HDMI): Enable to have the video stream output to the HDMI module in addition to the app.

Format SD Card: Tap to format the SD Card.

Aircraft

Go Home Altitude: Use this to set the altitude that the aircraft will return at when Return to Home is triggered.

Maximum Altitude: Sets the maximum flight altitude.

Dynamic Homepoint: When enabled, the home point will continuously be updated to the current location of your mobile device. Very useful in Follow mode.

Calibrate Compass: Tap to start calibration procedure. The aircraft LEDs will turn solid yellow and you can then start the "calibration dance".

Log Flights: Enable/Disable flight logs. Flight logs are saved in the mobile device's internal storage in the "LitchiApp/flightlogs" folder.

HealthyDrones.com User Token: Enter the token from your https://healthydrones.com/ account here. Your token should look like this: HD12345678. This token is a secure way to associate your flight logs with your account when they are uploaded to HealthyDrones.com.
`Info` Click here to learn more about how to setup HealthyDrones with Litchi.

HealthyDrones.com Automatic Sync: When enabled, and if your user token is valid, your flight logs will be automatically synced with your HealthyDrones.com account given the presence of an Internet connection.

Sync Photo/Video Previews: Photo preview screenshots and video preview screenshots will be automatically taken by Litchi during flights. Using this setting, you can allow Litchi to automatically sync up to 4 or 10 photo/video previews per flight log to your HealthyDrones.com account. Only works when using the hardware video decoder.
`Warning` This setting may increase the data usage of the app significantly.

Sync with HealthyDrones.com Now: Use this button to manually trigger a sync of your flight logs with your HealthyDrones.com account.

Automatic Take Off: When enabled, you will be able to start Waypoint missions, Follow sessions and Orbit sessions from the ground. If disabled, the aircraft will be required to be in the air before starting an autonomous flight.

Minimum Selectable Altitude: Defines the minimum altitude that can be set in autonomous flight mode settings.

Maximum Selectable Altitude: Defines the maximum altitude that can be set in autonomous flight mode settings.

Maximum Location Accuracy: This setting defines the minimum location accuracy required for Follow mode to work. If the mobile device GPS shows a higher accuracy than this value, Follow sessions will fail to start. Additionally, if during a Follow session the mobile device GPS accuracy jumps to a value that is higher than this setting, the aircraft will stop moving until the accuracy comes back to a healthy level. As a result, it is important to set this value correctly. It defaults to 15 meters, but if you are having issues with GPS accuracy and depending on your environment, you may want to increase the default value.

Gimbal FPV mode: Enables/disables the gimbal FPV mode. When enabled, the gimbal will synchronize with the aircraft movements to provide a first person view experience.

Gimbal Gesture Control: When on, tap the video screen and scroll up or down (as well as left/right for the Inspire 1) to move the gimbal.

Speech

Enable Speech: Enables/disables voice announcements and warnings.

Feedback Frequency: In seconds, determines the minimum frequency at which the voice feedback will be made.

Altitude Feedback: Enables/disables continuous altitude feedback.

Distance Feedback: Enables/disables continuous distance feedback.

Speed Feedback: Enables/disables continuous speed feedback.

Battery Feedback: Enables/disables continuous battery feedback.

Warnings Frequency: In seconds, determines the minimum frequency at which the voice warnings will be made.

Warn When Battery Drops Below: Voice warnings for the aircraft battery will start at this percentage.

Warn If Satellite Count Drops Below: There will be voice warnings for the satellite count whenever it drops below this value.

Keys

Each flight mode can have 2 different custom functions, for the C1 (left) and C2 (right) custom keys located in the back of the remote controller.
You can also bind 2 different custom function to C1 Long press and C2 Long press.

Map/Video Switch: Switches between the video and map as full screen/small screen.

Reset Gimbal: For the Phantom 3: toggles the gimbal between horizon and looking down. For the Inspire 1: resets the gimbal yaw.

Gimbal Pitch/Yaw: Inspire 1 only, switches between pitch and yaw gimbal control for the remote controller wheel.

VR mode: Toggles VR mode.

Pause/Resume Flight: Depending on the current autonomous flight mode status, pauses/stops or resumes the flight.

Home Point at Aircraft: Moves the Home Point to the aircraft's current location. You must be flying in order to move the Home Point.

Home Point at Device: Moves the Home Point to the mobile device's current location. You must be flying in order to move the Home Point.

Course Lock **(FPV, Focus)**: In FPV mode, Toggles Course Lock. In Focus mode, resets the "Joystick Reference" setting when "Aircraft Yaw" is enabled and "Joystick Reference" is set to "Aircraft Heading".

Home Lock **(FPV)**: Toggles Home Lock.

POI at Aircraft **(GS, Orbit, Focus)**: In GS, Orbit and Focus mode, adds a Point of Interest at the aircraft location.

POI at Device **(GS, Orbit, Focus)**: In GS, Orbit and Focus mode, adds a Point of Interest at the mobile device location.

Waypoint at Aircraft **(GS)**: In GS mode, adds a waypoint at the aircraft location. The newly added waypoint will have its altitude, heading and gimbal pitch angle automatically set to the current aircraft altitude, heading and gimbal pitch angle.

Waypoint at Device **(GS)**: In GS mode, adds a waypoint at the mobile device location.

Follow Heading Mode **(Follow)**: In Follow mode, switches the heading mode between "North" and "Course".

Follow from Aircraft Position **(Follow)**: In Follow mode, sets the relative altitude, distance and heading from the aircraft's current position.

Subject Offset from Aircraft **(Follow)**: In Follow mode, sets the subject offset setting based on the current aircraft heading relative to the follow heading setting.

<u>Orbit at Aircraft</u> **(Orbit)**: In Orbit mode, sets the radius and altitude from the aircraft location. Only works if the Orbit center is already set.

FAQ

1. Why is Litchi not connecting to my Phantom 3/Inspire 1?

When starting the app for the first time, you will need to be connected to Internet in order to validate the app with DJI servers.
Some Internet connections may have troubles connecting to DJI servers, in such a case make sure to try a different Internet connection.
Additionally, on Android if DJI Go is your default app for the remote controller USB connection, you will need to clear the defaults for DJI Go (Settings -> Apps -> DJI Go -> Clear Defaults).

2. My Waypoint/Follow/Orbit flights fail to start, why?

The remote controller mode switch needs to be in the F position in order for the aircraft to perform autonomous flights. If the problem persists, double check that you are using the latest supported firmware.

3. How to regain control of my aircraft during an autonomous flight?

Flip the remote controller mode switch into the P position. The aircraft will then stop the autonomous flight and you will regain control instantly.

4. Will the aircraft avoid obstacles if there are any?

No, always be aware of your surroundings when using any of the autonomous flight modes, the aircraft will not avoid obstacles should there be any.

5. Which firmware version do I need to use Litchi?

The latest public firmware.

6. Is my Android device supported by Litchi?

As a general rule, Litchi supports most mid to high-end Android devices. There are many Android devices and versions out there, and even two similar devices can yield very different results, for this reason there is no list of supported devices. The best way to find out if your device is supported by Litchi is to purchase the application and give it a try. If it ends up not working, you can ask for a refund during the 2 hours window. Please do let us know if you find a problem, and we will do our best to fix it.

7. I can't find HDR, 7-shot burst and AEB shooting modes where can I set them?

These shooting modes are not available to SDK developers. Whenever DJI adds them to the development kit, we will add them to Litchi.

8. Follow mode fails to start with error: "Your GPS location is not accurate enough to start Follow mode", why?

This error means that your mobile device GPS is not accurate enough, not to be confused with the aircraft's GPS signal. The "Accuracy" number at the bottom left of the screen shows how good your mobile device GPS signal is. If it is red, you will see this error as your mobile device is not able to determine a precise enough location. Many things can affect your mobile device GPS signal such as weather conditions, your location and environment, etc. In most cases it should be relatively easy to get less than 10 meters accuracy which is the default requirement for Follow to even start. Note that you can adjust this minimum requirement with the "Location accuracy" setting. Setting it to a higher value will allow for a bigger margin of error for the mobile device GPS signal, but the Follow movements may be less precise.

9. What is the difference between Litchi for Android and Litchi for iOS?

Currently Litchi for iOS only allows you to fly in FPV and Waypoint mode. It lacks some of the features you will find in the Android version because we only recently started working on it. We will continue improving both the Android and iOS versions in the future.

10. I am experiencing lag/freezes with the video stream, how can I fix it?

First make sure you are using the latest public firmware on both RC and aircraft. Then ensure there are

no apps running in the background, including screen recorders. If the problem continues, try to switch

the video decoder to Hardware in the general camera settings, it should improve performance in most

cases. Finally, if you are on Android, try to downgrade Google Play Services, it is known to cause

issues with the video stream on some devices. If all of these do not fix the issues, it is likely that your

device is either not compatible or not powerful enough to run Litchi.

11. I purchased the app on one device, can I install it on other devices?

You can install the app on as many devices as you want as long as they use the same platform and the

same "main" account (Google or Apple) that was used for the original purchase. If you want to use Litchi

on both Android and iOS, you will need to purchase Litchi on each platform.

12. I won't have Internet access where I want to fly, will I still be able to see the maps?

If you cache the maps prior to the flight, you will be able to see them even when offline. To cache maps

while connected to Internet, drag the map around where you are planning to fly, zoom in and zoom out.

You can exit Litchi in between but avoid restarting the mobile device as it may clear the cache.

13. I am experiencing disconnections while mid-flight on Android, how can I fix it?

In your mobile device settings, make sure Settings -> System -> Developer Options -> USB Debugging is

turned off. If that does not fix the problem, try a different USB cable.