

DOBBY

User Manual

V1.1

Table of Contents

Legend.....	1
Symbols.....	1
Suggested Usage.....	1
Downloading the App.....	1
Product Overview.....	2
Summary.....	2
Functional Highlights.....	2
aircraft part names.....	3
Aircraft.....	5
Summary.....	5
Aircraft On/off Switch and Power Indicator Light.....	5
Aircraft Status Indicator Light.....	5
GPS Positioning.....	6
Optic Flow and Ultrasonic Localization.....	6
Flight Data.....	7
Propeller.....	7
Battery.....	7
Camera.....	10
Micro-USB Port.....	10
Reset Button.....	11
App.....	12
Summary.....	12
Main User Interface.....	12
Account Upgrading and FunctionsUnlocking.....	15
App Settings.....	15
Media Library.....	17

Flying/Photo-shooting	19
Flight Environment Requirements.....	19
Flight Restrictions	19
Check before Flight.....	20
Compass Calibration	20
Protection Measures for Flight.....	21
Using the App for Flying/Photo-shooting	21
Appendix Parameter Specifications.....	27

Legend

Symbols



Warning



Note

Suggested Usage

Zerotech has provided the following manuals for DOBBY users:

List of Articles

Guide on Battery Safety

Disclaimer

DOBBY's Quick Start Guide

DOBBY User Manual

To learn how to use DOBBY, we suggest you read the provided manuals in this order: List of Articles, Guide on Battery Safety, Disclaimer and then the DOBBY' Quick Start Guide. If you want to learn more, then read the DOBBY User Manual.

Downloading the App

Before using this product, you need to download and install the Do.Fun app. You can scan the QR code from Zerotech's official website www.zerotech.com or download it from your phone's App store.

The Do.Fun app supports Android 4.3 and above/iOS 8.0 and above.

Product Overview

This section will cover DOBBY's functional characteristics and the aircraft part names.

Summary

DOBBY is a portable and easy to use 'Selfie-aircraft'. It consists of the aircraft itself and the Do.Fun app.

Through using the app, you can control DOBBY's flight and take photos. The app also allows you to give voice commands, use earphones and other methods for simple and easy control of DOBBY.

Functional Highlights

In order to give users a quick and safe selfie experience, DOBBY is equipped with a variety of great functions:

The App

The accompanying app is specifically developed for use with DOBBY and is really simple to use. It can be used in place of a remote controller for flight control and photo-shooting.

Optic Flow and Ultrasonic Wave Positioning

This positioning system combines motion analysis with an ultrasonic distance measurer and supports indoor flight.

High Definition Photo-shooting

Equipped with a professional high definition camera that supports 4208 x 3120 photos and shoots 1920 x 1080 video recordings.

10s Auto-Track Video Shooting

Allowing you to zoom in and out just like in films, the 10s auto-track video shooting turns you into a director for 10 seconds.

Digital Image Stabilization

After digital image stabilization, your 4K video footage becomes a 1080p high definition videos. The videos won't be blurry even if you're flying during recording.

Take-off/Landing in the Palm of Your Hand

DOBBY can take-off from and land safely in the palm of your hand.

Voice Control

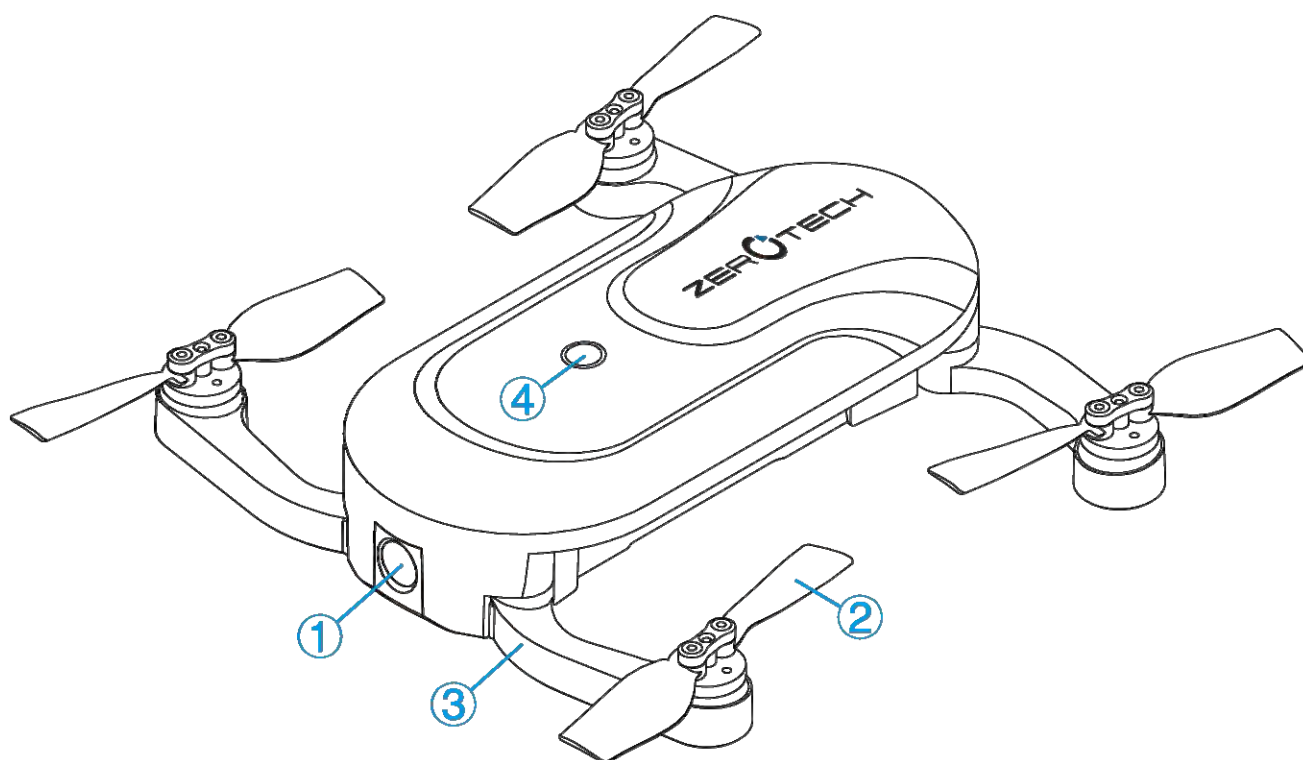
You can give voice commands through the app to control DOBBY's

flight and take photos.

Sharing at the Click of a Button

Share your photos directly with your friends on WeChat, Weibo, Facebook or other social media websites.

Aircraft Part Names

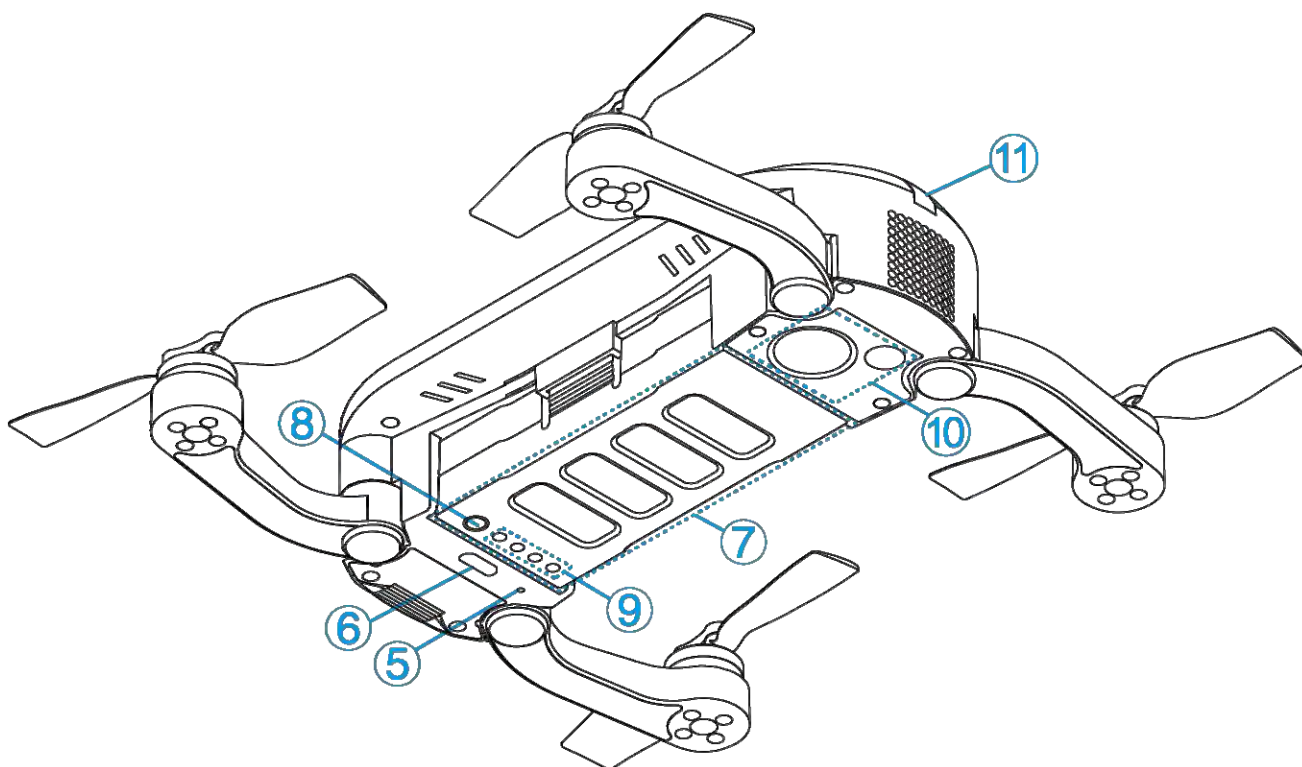


1. Camera

2. Propeller

3. Jib-arm

4. Aircraft On/Off Switch



5. Reset Button

6. Micro-USB Port

7. Battery

8. Battery Status
Button

9. Battery Status
Indicator Light

10. Optic Flow and
Ultrasonic Wave Positioning
Module

11. Aircraft Status
Indicator Light

Aircraft

Summary

DOBBY mainly consists of a flight system, positioning systems, communication system, a power supply and a camera. The section will explain the functions of each of these parts of the aircraft.

Aircraft On/Off Switch and Power Indicator Light

The aircraft's On/Off Switch has an inbuilt power indicator light.

Hold the on/off switch for 2 seconds. Wait until the light starts flashing blue, then remove your finger and the drone will switch on.

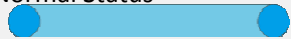





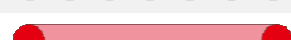


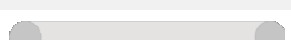
After a few seconds, the drone will make a noise alerting you that the ESC has turned on.

After connecting to the app, the power indicator light will turn blue.

Hold the on/off switch for 3 seconds. When the blue light goes out, remove your finger and the drone will switch off.

Aircraft Status Indicator Light

On the tail end of the drone there is an LED indicator light that changes color. This shows the status of the aircraft. The status indicator lights of the aircraft and their associated meaning are as follows:

Aircraft Status Indicator Light	Color	Meaning
Normal Status		
	Blue light	GPS Positioning
	Blue flashing light	Optic Flow and Ultrasonic Wave Positioning Error
Warning and Abnormal Status		
	Green flashing light	GPS Error
	Green and Yellow flashing light	Ultrasonic Wave Error
	Red and Yellow Flashing Light	Optic Flow Error
	Red Flashing Light	Low Charge Warning
	Red Light	No Charge Warning
	Purple Flashing Light	Dual Compass Error
Assistance Prompts		
	Green Light	Compass Calibration: Horizontal
	White Light	Compass Calibration: Vertical

GPS Positioning

The aircraft uses a GPS/GLONASS dual satellite positioning system. The satellite positioning system is GPS based, with GLONASS acting as a supplementary system.

During outdoor flight, the aircraft uses GPS positioning when it has found a GPS satellite number larger than 7.

Optic Flow and Ultrasonic Wave Positioning

The aircraft will use the optic flow and ultrasonic wave positioning during indoor flight. If the GPS signal is poor during outdoor flight (if the satellite number found is smaller than 6), then the aircraft will automatically switch to optic flow and ultrasonic wave positioning.

The optic flow and ultrasonic wave positioning system combines motion analysis to horizontally position the aircraft during flight and an ultrasonic distance measurer to determine the distance from the ground. It positions the aircraft during indoor flight and assists the GPS positioning system during outdoor flight.

The optic flow and ultrasonic wave positioning module is located on the base of the aircraft. It consists of an optical flow camera and an ultrasonic wave sensor.

Usage Conditions and Restrictions

The optic flow and ultrasonic wave positioning system is used for indoor flight. It is also used for outdoor flight if the GPS signal is weak. The operating height range for this positioning system is 0.5-3m.

When using this positioning system, after the aircraft has begun flying and ascended to 0.5m, it will determine if the requirements for using this system have been met. If they have not, it will initiate landing. If the requirements are not met for this system during flight, the aircraft will also initiate landing.

Requirements for the optic flow and ultrasonic wave positioning system: When using this system, the area underneath the aircraft needs to have a noticeable textured surface. Users can put a square cloth on the ground, table or over any large, flat surface to provide the required textured surface.



The optic flow and ultrasonic wave positioning system may not work under these circumstances, please use carefully:

- ✧ Above uniformly-coloured surfaces (Like completely black, white etc.);
- ✧ Above strongly reflective or inverted surfaces;
- ✧ Above water or clear objects;
- ✧ Above people or moving objects;
- ✧ Areas with rapidly changing/flashing lights;

- ✧ Above textured surfaces that are too bare or too cluttered;
 - ✧ Above objects or materials that easily absorb ultrasonic waves;
 - ✧ Above very bright or very dark objects/materials.
-



- ✧ Ensure that the optical flow camera surface is clear.
 - ✧ While the optic flow and ultrasonic wave system is operating, please do not use DOBBY near other ultrasonic equipment, including other drones.
 - ✧ The ultrasonic wave sensor will emit waves that are inaudible to humans but may cause distress to some animals. Please don't use DOBBY close to animals while using this positioning system.
-

Flight Data

DOBBY will begin to record flight data from the moment you turn it on. It will stop recording the data once the power source is turned off. The data file will be sent to your media library. The name of the file will be the time when the data was recorded. You can download the file directly to your mobile device from the app.

Propeller

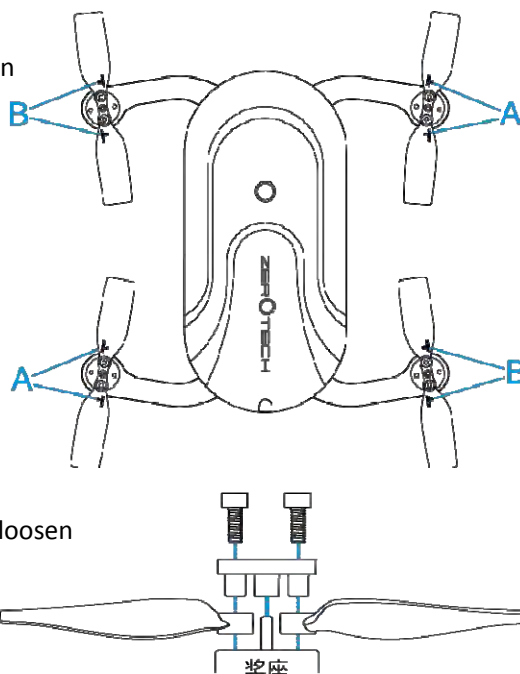
DOBBY has 4 sets (8 blades) of 3 inch long foldable propeller blades. The blades are already fitted, users only need to expand the jib-arms before flight. When you're done flying, fold the jib-arms and propellers into the base of the drone to prevent damaging them.

The propellers blades have either 'A' or 'B' on the top to indicate in which direction they spin, as shown on the first picture on the right.

Replacing the Propeller Blades

Old propeller blades must be replaced with new blades that spin in the same direction. Propeller blades with an 'A' on top must be replaced with new blades that also have an 'A', ones with a 'B' on top must be replaced with new blades that have a 'B', as in the first picture on the right.

Method for replacing the propeller blades: Use a screwdriver to loosen the screws, remove the old propeller blades and fit the new on propeller blades onto the base, as shown in the second picture on the right.



Please ensure that the propeller is tightly screwed in, to prevent against the screws coming loose and the propellers blades falling off during flight. It will need to be retightened after every 10 hours of flight.

Battery

The battery is designed specifically for use with DOBBY. It has a capacity rating of 970mAh and a nominal voltage of 7.6V. The battery's characteristics are as follows:

- Charge status: The battery comes with a battery status indicator light, which shows the battery's current charge;
- Balance Charging Protection: automatic balance of the battery's internal cell voltage to preserve the battery;
- Overcharge Protection: Overcharging can seriously damage the battery. The battery will stop charging once it has reached 8.7V;
- Over-discharge Protection: Over-discharging can seriously damage the battery. The battery will cease output when the discharge has reached 4.6V;
- Short-circuit Protection: If the battery short-circuits, it will cease output to protect itself. Before using DOBBY, ensure that the battery is fully charged. For more details about charging the battery, please refer to the "Charging the Battery" section on page 9.

Using the Battery

Before using DOBBY, please put batteries in the battery compartment.



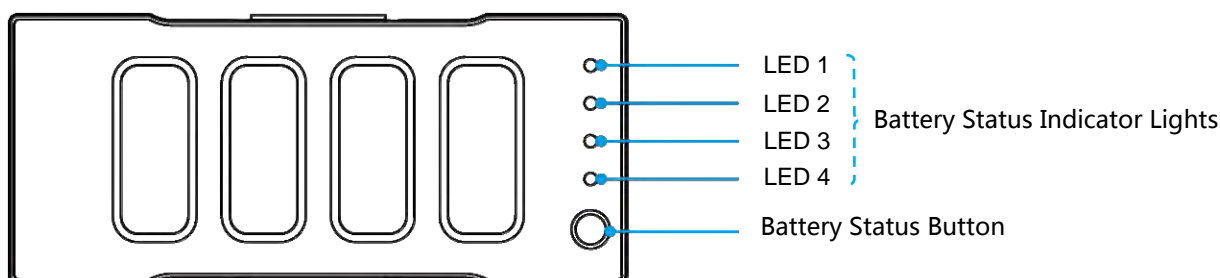
- ✧ Please don't remove the batteries while DOBBY is turned on.
- ✧ Don't use damaged or swollen batteries.
- ✧ In hot environments, be mindful of the battery overheating.
- ✧ If the battery gives off a strange smell, starts burning, changes shape/colour or shows any type of change during use, while charging or in storage, remove the battery immediately and do not continue to use it.



In colder environments, the battery's usage time may drop. Please charge the battery prior to use and keep it warm. You can warm it up in the battery compartment. Wait until it has completely warming up before flying again.




Battery Status Indicator Lights

The battery also has a battery status indicator light. It is set up as in the picture below :



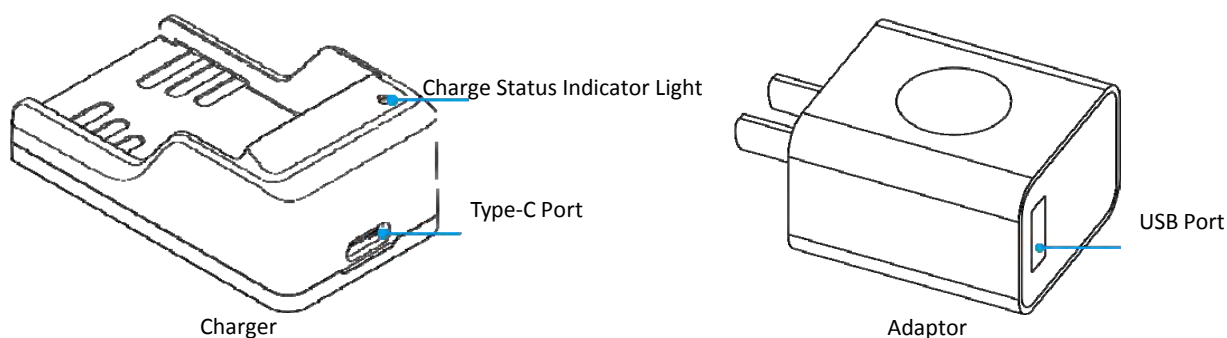
The battery status indicator lights are placed in order as LED1, LED2, LED3 and LED4. Press the battery status button to see the current charge. The indicator lights will automatically turn off after 3 seconds. The indicator light's status and the corresponding charge amounts are as follows:



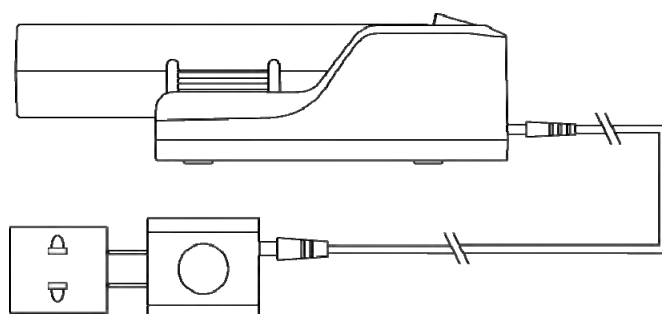
	25-50%
	50-75%
	75-100%

Charging the Battery

The battery comes with a charger, adaptor, and a USB cable.






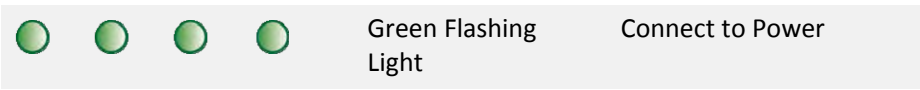
Plug the battery into the charger. Use the USB cable to connect the charger to the adaptor. Plug the adaptor into a power-point and the device will begin charging.



The charger uses high speed technology. Using it together with the accompanying adaptor allows for fast charging. The charge status indicator light will turn orange during fast charge. If you don't use the provided adaptor, the device may only be able to achieve slow charge. The charge status indicator light will turn red during slow charge.

If the charge status indicator light turns green, this means the battery is fully charged. Please turn off the power source and remove the battery from the charger. The charge status indicator light's status and their corresponding meanings are as follows:

Charge Status Indicator Light	Colour	Meaning
	Orange Light	Fast Charge
	Red Light	Slow Charge
	Green Light	Fully Charged





Red Flashing Light Error



We suggest you use the provided DOBBY Zerotech battery charging equipment to charge the battery. Any issues that occur due to use of other charging equipment shall be the responsibility of the user.



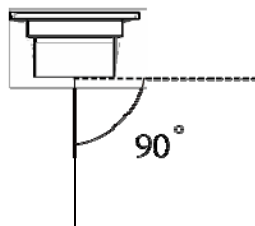
- ✧ Users can use a mobile power pack to charge the battery.
- ✧ The adaptor can only be used in areas that are below 2000m above sea level.

Camera

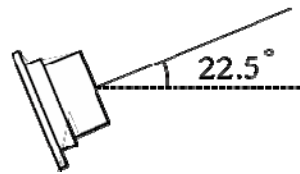
DOBBY is equipped with a high definition camera that can take 4208 x 3120 photos and shoot 1920 x 1080 videos.

Camera Pitch Angle Limit

The camera's pitch angle limit is: $-90^{\circ} \sim 22.5^{\circ}$. It is divided into 6 rotations, every rotation being 22.5° . The angles for smallest to largest are: -90° , -67.5° , -45° , -22.5° , 0 , 22.5° .



Maximum angle



Maximum elevation

The Camera's Maximum Angle and Elevation

Any adjustments of the pitch angle need to be done manually. Push the camera to the desired angle until it feels fixed into position and that it will not slide around.

Micro-USB Port

While DOBBY is turned on, use the provided USB cable and adaptor to connect DOBBY to your computer. You can then copy your photos and video recordings onto your computer.



- ✧ DOBBY must be turned on for it to be able to connect to your computer.
- ✧ DOBBY's Micro-USB port can only be connected to data communication interfaces, do not connect to power sources.

Reset Button

Hold down the reset button on the base of the aircraft for 3 seconds to reset the Wi-Fi, including:

1. The default SSID and password:

SSID: Dobby-xxxxxx, the 'xxxxxx' are the last 6 alphanumeric digits of the Wi-Fi's MAC address. Password: zerotech

2. The Wi-Fi frequency, which will reset to 2.4GHz.

App

This section will cover the main parts of the Do.Fun app and the set-up method.

Summary

The Do.Fun app is specifically developed to be used with DOBBY. Users can use Do.Fun as a remote controller for flight control and photo-shooting. You can download the app by scanning the QR code on Zerotech's official website www.zerotech.com, or you can download it from the app store on your mobile device.

Main User Interface

All the necessary status indicators and main function icons are on the main user interface. The layout is as follows:





- | | | |
|--------------------------|-------------------------------|-----------------------------|
| 1. Positioning Status | 2. Connection Status | 3. Aircraft Charge Status |
| 4. Palm Take-off/Landing | 5. One Click Take-off/Landing | 6. Voice Control |
| 7. Settings | 8. Timed Photo | 9. Mode/Parameter /Settings |
| 10. Shutter | 11. Record | 12. Media Library |

A brief description of these status indicators and function icons is below. For more details on flight control and camera operation, please refer to the “Using the App for Flight/Picture Taking” on page 2.

Positioning Status

The positioning status indicators and their corresponding meanings are as follows:

	Normal
	Error





If an error occurs with the positioning system during flight, DOBBY

will initiate landing.

Connection Status

The connection status indicators and their corresponding meanings are as follows:






	Not connected
	Connected



If the Wi-Fi connection is lost during flight , DOBBY will fly back towards you if the GPS positioning is being used, or initiate landing if the optic flow and ultrasonic wave positioning system is being used.

Aircraft Charge Status

The aircraft charge status indicators and their corresponding charge percentages are as follows :

	100%~81%
	80%~61%
	60%~41%
	40%~21%
	20%~1%



If the charge becomes too low during flight, DOBBY will initiate landing.



- ✧ A fully charged battery will allow for approximately 9 minutes of flight time.
- ✧ Please base your photo-shooting time on the amount of charge left, and connect the battery to charge as soon as possible.

Palm Take-off/Landing



After clicking this icon DOBBY,

will take-off from your palm.



After clicking this icon, DOBBY

will initiate a palm landing.

One Click Take-off/Landing



Clicking this icon will initiate take-off.



While flying, clicking this icon will initiate

landing

Voice Control



Clicking this icon will activate voice

control.

Settings



Users can register/logon to their account, change the app settings and search for related content by clicking this icon. You will have to use your mobile data or connect to a router to register/logon to your account and/or search for related content.

Timed Photos



Click this icon to start timed photos and to set the delay time.

Mode/Parameters/Settings

Mode



Single Shot: Clicking this icon to enter into single shot mode.



Burst shot: Click this icon to enter burst shot

mode and set the amount of photos you wish to take.



Short Video: Click this to enter 10s auto-track

video shooting mode.

Parameters

White Balance: Click this icon to set the white balance.

EV: Click this icon to select the EV value.

Settings Image stabilization: Select the flight path angle lens in 10s auto-track video shooting and open the image stabilization function.

Shutter

r



Click this icon to take photos.

Record



Click this icon to record.

Media Library



Click this icon to look at your media library.

Upgrading Your Account and Function Unlocking

After using your Zerotech account to logon to the app, your account will be upgraded one level for every 10 minutes of flight. Once your account has reached a certain level, certain functions will be unlocked as shown in the table below:

Account Level	Type	Flying Height Restriction	Indoor Flight	Palm Take-off/Landing	Voice Control	Somersault
LV1-LV3	Beginner	10m	X	X	X	X
LV4	Intermediate	30m	√	X	X	X
LV5			(You will need to confirm every time before initiating indoor flight)	√	X	X
LV6				√	√	X
LV7 and Above	Advanced	50m	√	√	√	√

App Settings

The options in the app settings include: Camera shake warning, Control method, Controller mode, Hand switching (left and right), Somersault, Change Wi-Fi details,

Wi-Fi frequency, Compass calibration, Preview resolution and Available storage space.

Camera Shake Warning

This is turned off by default. When this is activated, a notification will pop-up on your mobile device when taking photos.

Control Method

The default control method is set to motion controller.

Do.Fun comes with two control methods that users can choose between: the motion controller and the swipe method. Using your mobile device's gravity sensor, the motion controller method allows you to control DOBBY's flight by tilting your mobile device.

For specifics on operation, please refer to the "Motion Controller Method" section on page 22.

Looking through the camera's point of view, the swipe method allows you to control DOBBY's flight by moving your fingers in the viewfinder frame on your screen. For specifics on operation, please refer to the "Swipe Method" section on page 23.

Controller Mode

The default controller mode is set to reverse controller.

The reverse controller is used for taking selfies. When in use, the camera perspective is opposite to the user's perspective. After turning this mode on, DOBBY's flight direction will follow the user's perspective. The flight direction will be the same as the operating direction for the user. Please refer to the "Motion Controller Method" section on page 22.

When using the forward facing controller, DOBBY's flight direction will follow the camera's perspective. DOBBY's flight direction will be the same as the user's operational direction. When you're not taking selfies, we suggest you use the forward facing controller for easier operation.


The controller mode is only used with the motion controller. The swipe method always follows the camera's perspective.

Hand Switching (left and right)

The default position of the throttle is on the on the right hand side.

You can choose between a left hand throttle (The throttle being on the left side of the screen) or a right hand throttle (the throttle being on the right side of the screen). Please refer to the "Motion Controller" section on page 22.

Somersault

After starting this function, the  "Somersault" icon will appear on the bottom left hand side of the screen.

Every time you click this icon, DOBBY will do a somersault. The shortest interval between somersaults is 1 second.

Changing the Wi-Fi Details

Users can change the Wi-Fi's SSID and password. The SSID can be up to 16 characters long. It can be written in

Chinese, English, numbers or special characters. The password has to be between 8-20 characters long and can be made up of numbers, letters and/or special characters.

Switching Between Wi-Fi Frequencies

The default frequency is set to 2.4GHz.

DOBBY supports both a 2.4GHz and 5GHz frequency. You can switch between them on this page.

Compass Calibration

The Do.Fun app can assist with compass calibration. Please refer to the “Compass Calibration” section on page 20.

Preview Resolution

The default preview resolution is set to 320 x 240.

You can choose from three real time preview resolution options (1280 x 720, 640 x 480 and 320 x 240) on the viewfinder screen.

Available Storage

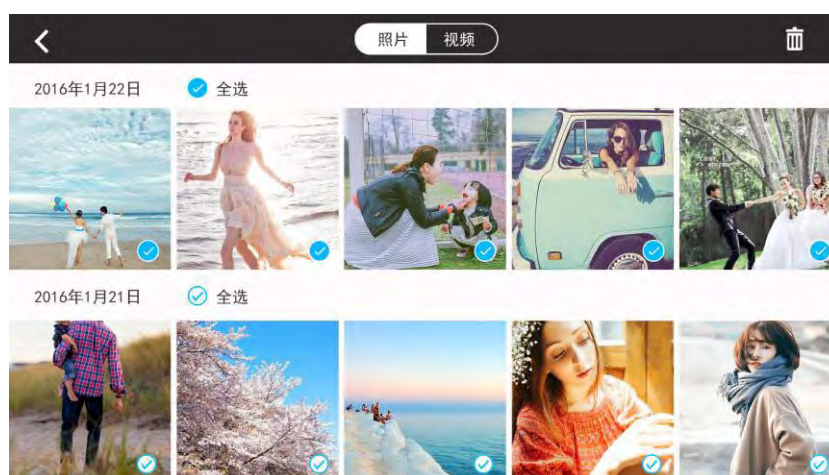
Check the available storage space on DOBBY. Please base your photo-shooting on the available storage space and routinely clear DOBBY's memory.

Media Library

When opening the media library, it will go to photo gallery by default. It displays photos in date order. Click the "Video" button at the top of the screen to switch to the video gallery.

Photos

After you connect to DOBBY's Wi-Fi, when you take photos the thumbnails will automatically be sent to your mobile device. The photo page displays thumbnails in date order. Swipe up to load more thumbnails and swipe down the load new thumbnails.



Selecting Photos

To select a photo, click the tick in the bottom right hand corner of the photo. To select all photos, click the "Select All" icon next to the date at the top of the screen.

Deleting Photos

After selecting a photo, click the "Delete" icon in the upper right hand corner of the screen to remove the photos you have selected from your media library. When you are connected to DOBBY's Wi-Fi, it will delete the files from both DOBBY and your mobile device. When the Wi-Fi is not connected, you are not able to delete the files from DOBBY.

The browsing page also has a "Delete" icon so you can delete photos directly.

Downloading & Browsing

You can download and browse through your photos by clicking on the thumbnails. You can download photos directly from the thumbnail browsing page. You can download photos by swiping left and right and browse photos by swiping up and down. Selecting a photo will make it full screen.



If you have an iOS, allow access to your photo gallery in system settings, otherwise you will only be able to click the 'download' button in the top right hand corner to download photos to your gallery (Only iOS' have the 'Download' button on the photos page). Other downloading methods will download photos into a new folder and won't be able to download photos into your gallery.

Photo Sharing

There is a "Share" icon on the browsing page, clicking this icon will share your photos instantly to your WeChat, Weibo and Facebook.



Sharing your photos will either use your mobile data or switch your Wi-Fi connection back to a router.

Video

Browsing through videos is basically the same as browsing through photos, but to download videos to your mobile device you must click the "Download" icon on the top right hand corner after selecting the video. There will be a progress bar during the download. You can download multiple videos at the same time. You can also background download.

You can share your videos directly with your friends on WeChat, Weibo and Facebook.



iOS mobile device users, please allow access to photo gallery in system settings, otherwise you will only be able to download videos into a new folder and not into your gallery.

Flying/Photo-shooting

Before flying please read the Disclaimer and Guide on Battery Safety to understand the safety precautions. This section will cover what you need to know and how you need to prepare before flying DOBBY, as well as details on flight and photo shooting operation.

Flight Environment Requirements

Indoors

DOBBY uses the optic flow and ultrasonic wave positioning system during indoor flight. The flight area needs to be above a textured surface that is not too bare or too cluttered. If you can't find an appropriate surface, you will need to lay a square cloth on the floor, table or other flat surface. Indoor flight needs to be conducted in a well-lit area (Luminosity >15 lux), an ordinary fluorescent light bulb will be enough to fulfill this requirement. For more information on indoor flight environment requirements, please refer to the "Optic Flow and Ultrasonic Wave Positioning" section on page 6.

Outdoors

Don't fly DOBBY in bad weather conditions, such as in wind, rain, snow etc.

Please fly in open areas with no large buildings or structures.

When flying, always keep DOBBY in your line of sight.

Ensure that you avoid obstacles, high voltage wires, trees and shrubbery, groups of people, bodies of water etc.

This aircraft cannot operate in the north and south poles.

In areas 3000m or higher above sea level, flight function may be affected due to environmental conditions. Please fly with caution.

If the GPS signal is weak, DOBBY will automatically switch to the optic flow and ultrasonic wave positioning system. Please ensure the requirements for the optic flow and ultrasonic wave positioning system are met. Please refer to the "Optic Flow and Ultrasonic Wave Positioning" section on page 6.

Flight Restrictions

Maximum height using GPS positioning: 50m.

Maximum height using optic flow and ultrasonic wave positioning: 3m.

Controlling distance: 100m (In open areas with no obstructions)

No-Fly Zones

According to policy and regulation, Beijing's five ring roads, areas of Xinjiang and the surrounding areas of airports are strictly no fly zones.

The drone will not be able to begin flight in restricted areas while using GPS mode. The app will notify you: "Cannot fly in a no fly zone."

What to Check Before Flight

Please check the following before flying. Only begin flying if all of the following conditions are met:

1. Check that DOBBY and your mobile device have enough charge;
2. Ensure that the jib-arms are fully expanded;
3. Check that the propeller blades and other parts of the aircraft aren't loose or damaged;
4. Check that the lenses on the optical flow camera and the front facing camera are clean.

Compass Calibration

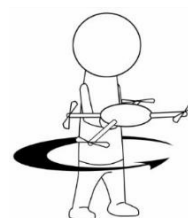


- ✧ You need to calibrate your compass before flying DOBBY for the first time. Otherwise, the system may not be able to function normally, which can affect flight safety.
- ✧ The compass is easily interfered with by other electronic equipment. This can lead to data abnormalities, affect flight and even lead to crashes. Regular re-calibration ensures that the compass is working at its best.
- ✧ Please re-calibrate your compass in the following circumstances :
 - Before the first time flying and the first time flying outside;
 - When the distance between the last location you flew and the current location you are flying is quite far;
 - When there is serious drifting during flight, such as the inability to flight straight.
- ✧ Please open the jib-arms prior to calibration to avoid interference during calibration.
- ✧ Do not calibrate your compass near large metal objects or in places with strong magnetic fields.

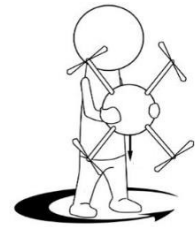
You can calibrate your compass in the Do.Fun app. Go to "Settings" – "Calibrate Compass" and you will be prompted to start calibration process.

The process for compass calibration is as follows :

1. Open up the jib-arms. Select "Compass calibration" in the app's settings page to start.
2. Follow to written and visual instructions on the notification. Keep the aircraft level, set to the required angle until the aircraft flight status indicator turns green. Then, slowly rotate the aircraft 1-3 times. During this rotation make sure the light stays green or you will need to adjust the aircraft's angle once again. Afterwards, the app will automatically send you a notification.



3. Follow the written and visual instructions on the notification. Hold DOBBY vertically and the aircraft flight status indicator light will turn white. Then, slowly rotate DOBBY 1-3 times. Afterwards, make sure the light stays white or you will need to adjust DOBBY's angle once again and continue to rotate it.



4. The app will notify you once calibration is complete. At this point the aircraft status indicator light will show the aircraft's actual status.



- ✧ After horizontal calibration , immediately begin vertical calibration , don't stop midway.
- ✧ Will take effective immediately (no need to restart to aircraft).

Flight Protection

In order to ensure safe use and to avoid damage, Zerotech has fitted DOBBY with multiple flight protection measures :



- ✧ If the battery charge is low or if there is a serious error, DOBBY will begin landing.
- ✧ If both the GPS and the optic flow and ultrasonic wave positioning system are not working, DOBBY will automatically initiate landing.
- ✧ If the Wi-Fi connection is lost or the app drops out, when using the GPS positioning system DOBBY will fly back towards you. When using the optic flow and ultrasonic wave positioning system DOBBY will initiate landing.
- ✧ When the app is minimized or if you get a phone call, DOBBY will enter safety hover mode until you reopen the app. If the charge is too low while hovering, DOBBY will initiate landing.
- ✧ When DOBBY tilts beyond 45°, it will automatically turn off as a safety precaution (excluding during the somersaults).

Using the App for Flight and Photo-shooting

Connect your mobile device to DOBBY's Wi-Fi (The default SSID is "Dobby-XXXXXX", the 'XXXXXX' is the last six alphanumeric digits of the Wi-Fi's MAC. The default password is "zerotech." You can change these details in settings) and open the Do.Fun app's main user interface. If the connection status on the right hand side of the page says "Connected", then you are ready to start flying.





- ✧ When flying, keep DOBBY in your line of sight.
- ✧ When you touch DOBBY with your hand or other objects, like when using the palm take-off/landing function, take care not to touch the propeller. Aside from this, please ensure you keep DOBBY a good distance away from people, water and other objects.



✧ Take extra care not to run into people or objects during indoor flight.

Take-off/Landing



One Click Take-off

Hold the  "One click take-off" icon on the left hand side of the main user interface. After the 3 second timer has finished, DOBBY will take-off. DOBBY will ascend 1.5m high during take-off. Afterwards, the icon will switch to  "Landing".




Landing

Click the  "Landing" icon and DOBBY will proceed to land. After landing the icon will switch to the  "Landing" icon.

Palm Take-off

Click the  "Palm Take-off" icon. A notification will pop-up on the app with the options "Confirm" and "Cancel". "Confirm" will initiate take-off, "Cancel" will not. After take-off the icon should switch to  "Palm Landing".

Palm Landing

Fly Dobby at head level height and then click the  "Palm Landing" icon. The icon will change into this: 
Extend your palm underneath DOBBY and then it will slowly land in your palm and turn off. The furthest distance between your palm and DOBBY for this to work is 0.5m. Users must complete this action within 10 seconds of clicking the icon or the palm landing function will automatically shut down. When the icon changes back to this,  it indicates that that the palm landing function is no longer active.

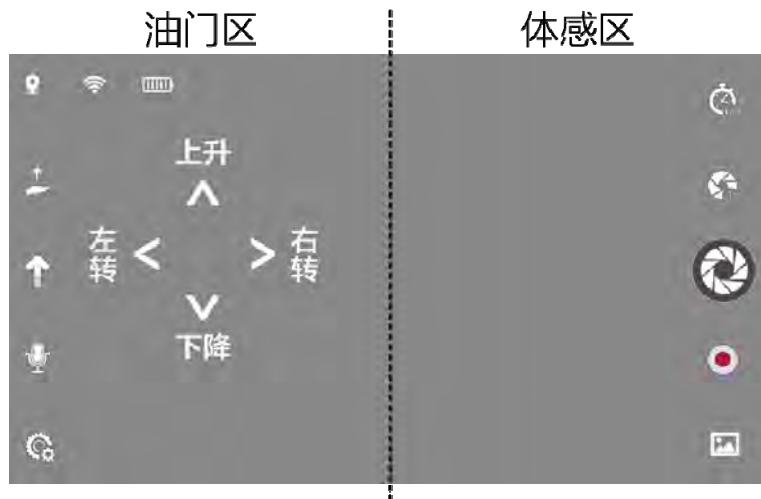
Flight Control



- ✧ During your first time flying DOBBY, please only operate the aircraft on a small scale. Pay attention to the flight direction and adjust the flight speed, slowly working towards large scale operation.
- ✧ Please don't operate on too large of scale, so as to avoid unexpected accidents.

Motion Controller Method

Using your mobile device's gravity sensor system, you can control flight by tilting your mobile device. Take the left hand throttle as an example: the left side of the screen is the throttle, the right side is the motion controller, as in the picture below:



(图内容的翻译：Throttle, Up, Down, Left turn, Right Turn, Motion Controller)

Flying Forwards/Backwards/Left/Right: Press any part of the motion controller area and tilt your mobile device forward, backward, left or right. To avoid any mishaps, the sensor will only work when your phone is tilted within 45°.

Ascent/Descent: Move your finger up and down on the throttle; Left/Right Turn: Move your finger left and right on the throttle



- ✧ The default position of the throttle is set to the right hand side. You can move it to the left hand side in “Settings” – “Hand Switching (left and right)”.
- ✧ The default controller mode is set to reverse controller. You can change this to forward facing controller in “Settings” – “Controller Mode”. For more information on the reverse controller and its applicable usage, please refer to the “Controller Mode” section on page 16.
- ✧ The default control method is set to motion controller. If you have switched to Swipe Method , you can switch back to the swipe method in “Settings” – “Control Mode”.


Swipe Method


Looking through the camera’s point of view, you can control DOBBY’s flight by moving your finger within the viewfinder frame.

Ascent/Descent, flying left/right: Move your fingers up/down, left/right in the viewfinder screen;

Flying backwards: Place two fingers on the viewfinder screen and pull them inward;

Flying forwards: Place two fingers in the viewfinder screen and push them outwards;

Turning left/right: After clicking the  “Turn” icon in the top right hand corner of the

screen, it will change to this:  Moving your finger left/right in the viewfinder

frame will make DOBBY turn left/right. Clicking this icon  again will exit this

function.

The default control method is set to motion controller. You can change this to the swipe method in “Settings” – “Control Method”.




Taking Photos/Video Recording

Photos

In single shot mode, every time you click the  “Shutter” icon, DOBBY will take one photo.



In burst shot mode, every time you click the  “Shutter” icon, DOBBY will take a series of photos.

You can take photos using the volume control (+/-) on your mobile device or earphones. It is the same method as using the  “Shutter” icon.



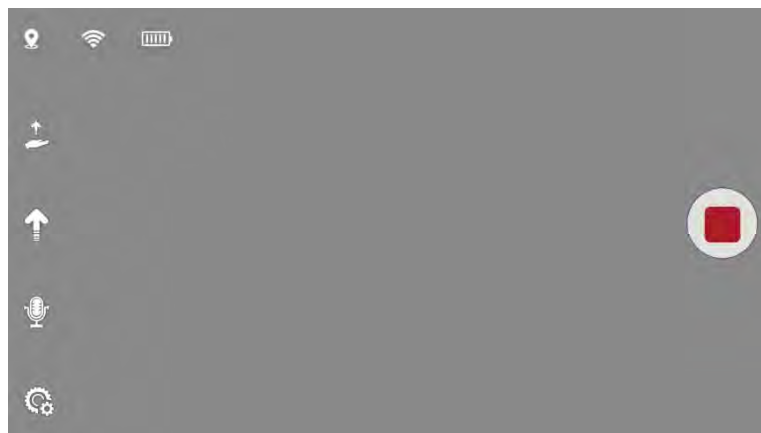
- ✧ The default photo shooting mode is set to single shot. You can switch between single shot/burst shot mode and set the amount of photos taken in burst shot (the default amount is 3 photos) in “Mode/Parameters/Settings” – “Mode”. Please refer to the “Mode/Parameters/Settings” section on page 14.
 - ✧ Timed photos are turned off by default. You can switch this function on in “Timed Photos” and set the delay time. Please refer to the “Timed Photos” section on page 14.
-

Video Recording

Hold the  “Record” icon to begin recording on the recording interface. Click the  “Stop Recording” icon to stop recording and return to the main user interface.


There is no time limit for video recording. The video length will appear on the bottom of the screen.

The video recording screen looks like the picture below :



You can use the motion controller and swipe control for flight while recording.


10s Auto-track Video Shooting

Click the second icon “Mode/Parameters/Settings” on the upper right hand side. Select the  “Short Video” icon from the “Mode” menu that pops up to enter the 10s auto-track video shooting mode.

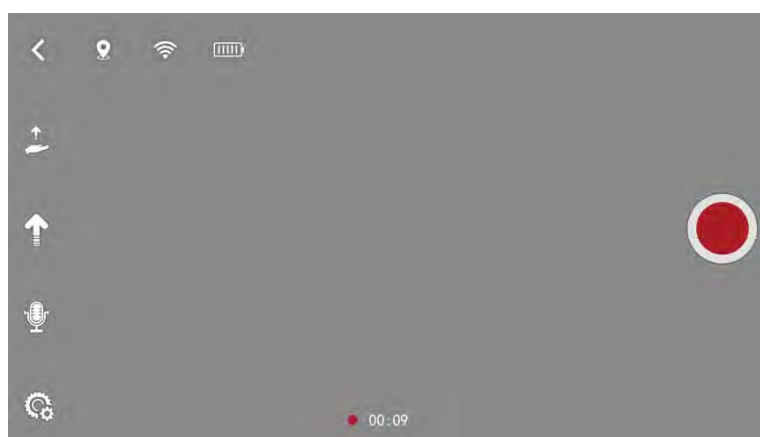
On the short video interface click the  “Record” icon to record a video.

DOBBY will fly in the direction of the set flight path angle lens. Removing your hand from the screen will stop recording and DOBBY will automatically fly back towards you. You can also record short videos during DOBBY’s return flight.

Short videos can only be 10s long, the recording time will appear on the bottom of the screen.

Click the  icon on the top left hand corner to return to the main user interface.

The short video screen looks like this:



- ✧ You can select the flight path angle lens in “Settings” – “Mode/Parameters/Settings”. Please refer to the “Mode/Parameters/Settings” section on page 14.
- ✧ The flight path angle lens needs to correspond to the camera’s pitch angle. The camera’s pitch angle can be adjusted by hand. Please refer to the “Camera” section on page 10.
- ✧ You can only use the short video function while using the GPS positioning system.
- ✧ Using the motion controller or swipe method will exit short video recording mode.


Image Stabilization

The image stabilization function stabilizes video picture whilst you are recording to minimize shakiness. We suggest you use it during both video recording and the 10 auto-track video shooting.

Opening the image stabilization function: Go to “Mode/Parameters/Settings” - “Settings”. Select the flight path angle lens in 10s auto-track video shooting and turn on the image stabilizer. Every time you open the app you will need to turn on the image stabilizer again.

Closing the image stabilizer: When the aircraft’s temperature reaches 70°C or if you exit the app, the image stabilizer will turn off automatically.

Voice Control

Hold the  “Voice Control” icon on the left hand side of the main user interface. An image of a microphone will pop up in the middle of your screen. You can control DOBBY’s movements by speaking commands into your mobile device.

Command in Chinese	Command in English	DOBBY's Action
起飞	Fly Up	Take-off
降落	Get Down	Landing
拍照	Cheers	Takes a Photo
多比	DOBBY Go	Palm Take-off
回家	DOBBY Back	Palm Landing

Statement

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
 - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference and
- 2) this device must accept any interference received, including interference that may cause undesired operation of the device.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

NCC Statement

根據NCC低功率電波輻射性電機管理辦法 規定:

第十二條	經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
第十四條	<p>低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。</p> <p>前項合法通信，指依電信法規定作業之無線電通信。</p> <p>低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。</p>

Appendix Parameter Specification

Aircraft	
Weight (Including battery)	199g
Length (Excluding propeller)	Expanded : 135mm × 145mm × 36.8mm Folded : 135mm × 67mm × 36.8mm
Maximum usage height (meters above sea level) 3000m	
Flight duration	9 minutes (at 0m above sea level)
Operating temperature	0~40°C
Highest wind resistance	28km/h
Positioning system	Outdoors : GPS/GLONASS Dual satellite positioning Indoors: Optic flow and ultrasonic wave (Luminosity>15lux)
Maximum usage height)	GPS positioning: 50m (May need to be adjusted to your country's regulations) Optic flow and ultrasonic wave positioning: 3m
Controlling distance	100m (In open areas with no obstructions)
Hovering accuracy 0.5 m (Outdoors)	Vertical: +/- 0.1 m (during normal operation with optic flow positioning) +/- 0.5 m (Outdoors) Horizontal: +/- 0.3m (during normal operation with optic flow positioning) +/- 1.0m (outdoors)
Wi-Fi	
Wi-Fi frequency	2.4GHz frequency; 5GHz frequency
Camera	
Image sensor	1/3.06 inch CMOS; Effective pixels 13,000,000
Lens	FOV 75°; 28mm (35mm format equivalent) f/2.2; Infinity focus
Camera pitch limit	-90°~22.5°
Photo resolution	4208 × 3120
Photo-shooting modes	Single Shot Burst Shot : 2~15photos Timed shot
White balancing	Automatic; Bright; Fluorescent; Daylight; Cloudy

EV range	-12; -8; -4; 0; 4; 8; 12
Timed Shots	3s; 5s; 10s; 20s
Video resolution	4K@30fps after image stabilization 1080p@30fps
Video shooting modes	High definition video shooting 10s auto-track short video shooting
Storage format	Photo: JPG Video: MP4 (MPEG-4 AVC/H.264)
Storage capacity	16G
USB port type	Micro-USB port
Battery	
Capacity rating	970mAh
Energy rating	7.37Wh
Nominal voltage	7.6V
Battery type	LiPo 2S
Operating temperature (charge)	0~45°C
Operating temperature (discharge)	0~45°C
Charge voltage limit	8.7V
Charging dock	
Charging dock port type	Type-C
Input	DC 9V/ 2A
Output	DC 8.7V/ 1.5A
Adaptor	
Input	AC 100~240V 50/ 60Hz 0.5A
Output	DC 9V/ 2A
App	
App name	Do.Fun
Real time image transmission	1280 × 720@30fps ; 640 × 480@30fps ; 320 × 240@30fps
Delay	160ms (Depends on the environment and mobile device used)
Required mobile devices	Android 4.3 and above iOS 8.0 and above

