

# S85

S85 FPV RTF  
INSTRUCTION  
MANUAL



FPV RTF

## **WARNING**

Please read the **ENTIRE** instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

This is a sophisticated hobby product. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this product in a safe and responsible manner could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or serious injury.

**Age Recommendation: Not for children under 14 years. This is not a toy.**

## **MEANING OF SAFETY SIGNAL WORDS**

The following terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

- **NOTICE:** Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.
- **CAUTION:** Procedures, which if not properly followed, create the probability of physical property damage AND a possibility of serious injury.
- **WARNING:** Procedures, which if not properly followed, create the probability of property damage, collateral damage, and serious injury OR create a high probability of superficial injury.

## **SAFETY PRECAUTIONS AND WARNINGS**

- Always keep a safe distance in all directions around your model to avoid collisions or injury. This model is controlled by a radio signal subject to interference from many sources outside your control. Interference can cause momentary loss of

control.

- Always operate your model in open spaces away from full-size vehicles, traffic and people.
- Always carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.).
- Always keep all chemicals, small parts and anything electrical out of the reach of children.
- Always avoid water exposure to all equipment not specifically designed and protected for this purpose. Moisture causes damage to electronics.
- **Never** place any portion of the model in your mouth as it could cause serious injury or even death.
- **Never** operate your model with low transmitter batteries.
- Always keep aircraft in sight and under control.
- Always move the throttle fully down at rotor strike.
- Always use fully charged batteries.
- Always keep transmitter powered on while aircraft is powered.
- Always remove batteries before disassembly.
- Always keep moving parts clean.
- Always keep parts dry.
- Always let parts cool after use before touching.
- Always remove batteries after use.
- **Never** operate aircraft with damaged wiring.
- **Never** touch moving parts.

**If you are operating this product in North America, you are required to have an Amateur Radio (HAM) license. Visit [www.arrl.org](http://www.arrl.org) for more information.**

## CONTENTS

- Frame kit x1
- Motor-8.5mm Brushed x4
- 40mm propeller x4

- Battery-500mAH 1S 3.8V 25C LiHV x1
- Charger-1S USB Li-Po Charger x1
- Transmitter x1
- 25mW VTX 600TVL FPV Camera x1

## SPECIFICATIONS

- Length: 100mm (3.94in)
- Width : 100mm ( 3.94in )
- Height: 50mm (1.97in)
- Propeller Diameter: 40mm (1.57in)
- Flying Weight: 54g (1.90oz)

## First Flight Preparation

- Remove and inspect contents
- Begin charging the flight battery
- Assemble the aircraft
- Program your transmitter
- Install the flight battery in the aircraft (once it has been fully charged)
- Bind your transmitter
- Familiarize yourself with the controls
- Find a suitable area for flying
- Power on the aircraft. The LED on the top of the aircraft turns solid, indicating the initialization has completed.


## CHARGING WARNINGS



**WARNING:** Failure to comply with the following warnings could result in product malfunction, electrical issues, excessive heat, FIRE, and ultimately injury and property damage.

- **NEVER LEAVE CHARGING BATTERIES UNATTENDED.**
- **NEVER CHARGE BATTERIES OVERNIGHT.**
- **Never** charge damaged batteries. If the battery begins to swell during charging or use, discontinue immediately.
- Always use the included battery and charger. Disconnect the battery after charging.
- Charge batteries away from flammable materials in a well-ventilated area.
- **Never** charge, transport, or store batteries in hot, cold, or very sunny places (recommended between 41–104°F or 5–40°C).

## Charge the Flight Battery

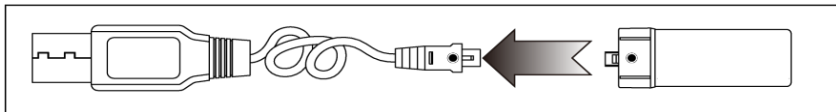
 **CAUTION:** Only use chargers specifically designed to charge the included Li-Po battery. Failure to do so could result in fire, causing injury or property damage.

 **CAUTION:** **Never exceed the recommended charge rate.**


The USB battery charger included with your aircraft has been designed to safely charge the 1S 3.8V 500mAH 25C Li-Po flight battery.

**NOTICE:** Inspect the battery to make sure it is not damaged e.g., swollen, bent, broken or punctured. Charge only batteries that are cool to the touch and are not damaged.

1. Insert the charger into a USB port.
2. Connect the battery to the charger as shown in the illustration (Notice: Keep both red dots on the same side.) When you make the connection successfully, the LED on the charger turns solid red, indicating charging has begun. Charging a fully discharged (not over-discharged) 500mAH battery takes approximately 60 minutes. The LED turns solid green when the charge is complete.



3. Always disconnect the flight battery from the charger immediately upon completion of charging.

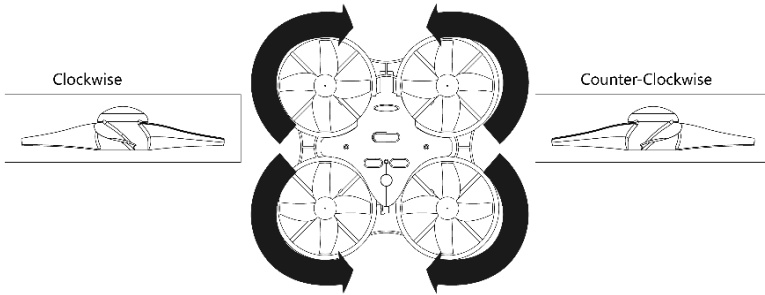
 **CAUTION:** **Once charging is complete, immediately remove the battery. Never leave a battery connected to the charger.**

## Installing the Propellers

Refer to the illustration for the proper motor rotation and propeller location.

The propellers are press fit onto the motor shafts. Remove the propellers by pulling the center hub straight up away from the motor.

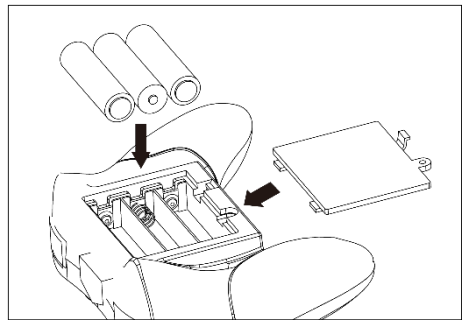
Install the propellers by pressing the center hub over the motor shaft, being careful not to press it too far down on the shaft. The propeller and motor should spin freely when installed correctly.



## Installing the Transmitter Batteries (RTF)

The LED indicator flashes and the transmitter beeps progressively faster as the battery voltage drops.

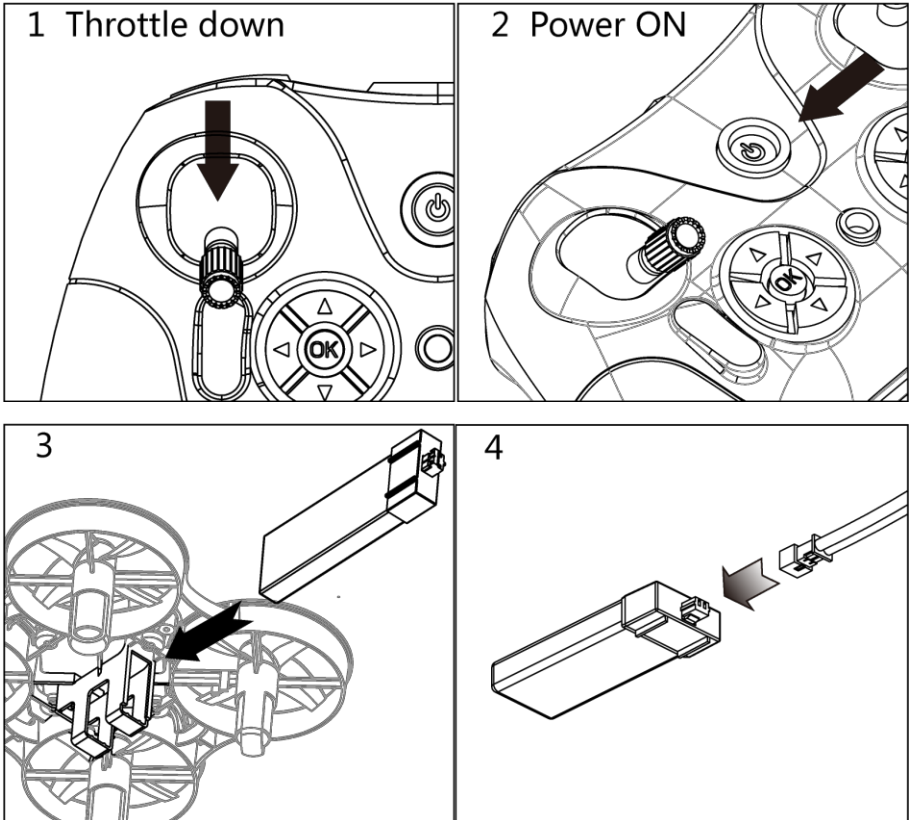
Replace the transmitter batteries when the transmitter begins to beep.



## Install the Flight Battery

**⚠ CAUTION:** Always disconnect the Li-Po battery from the aircraft when not flying to avoid over-discharging the battery.

Batteries discharged to a voltage lower than the lowest approved voltage may become damaged, resulting in loss of performance and potential fire when the batteries are charged.



## Transmitter and Receiver Binding

Power off the transmitter. Press button D and power on the transmitter at the same time. Then release button D, the transmitter beeps and the LED flashes for 5 seconds. Power on the drone in 5 seconds.

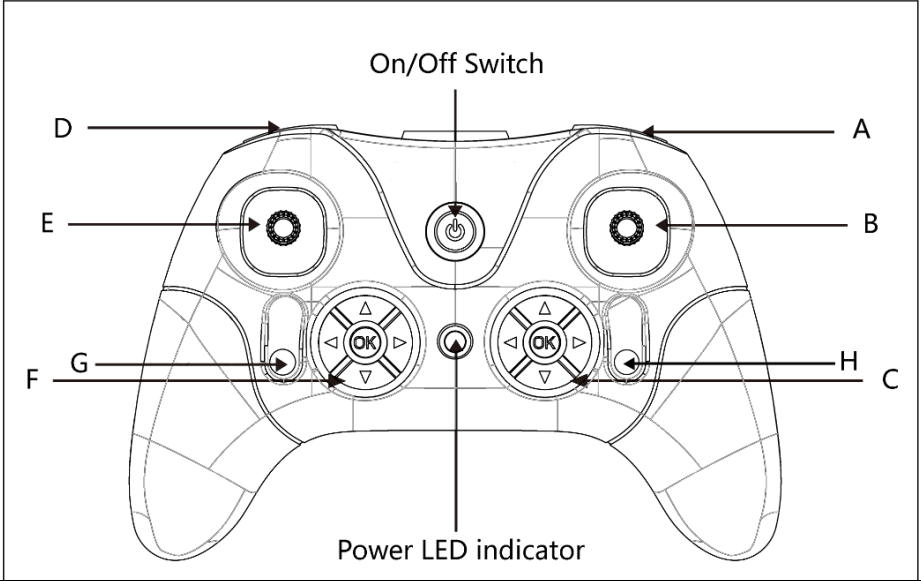
The LED turns solid, indicating the bind is successful.

The LED flashes if bind is failed.

**Note:** You do not need to do it again once the binding is successful.

Power on the remote controller first and then plug in the battery to the drone.

### Transmitter Control (RTF)



Mode	A	B	C	D	E	F	G
<b>M1</b>	<b>One key revert</b> / One key flip	<b>Throttle</b> (Up/Down) /Roll (Left/Right)	<b>Throttle</b> Trim /Roll Trim	<b>Mode</b> Switch (3/6 axis)	<b>Pitch</b> ( Front/Back ) /Yaw (levatoration/ dextrorotation)	<b>Pitch Trim</b> /Yaw Trim	<b>Air</b> pressure mode
<b>M2</b>		<b>Pitch</b> ( Front/Back ) /Roll ( Left/Right )	<b>Pitch</b> Trim /Roll Trim		<b>Throttle</b> (Up/Down) /Yaw (levatoration/ dextrorotation)	<b>Throttle Trim</b> /Yaw Trim	



## Calibration

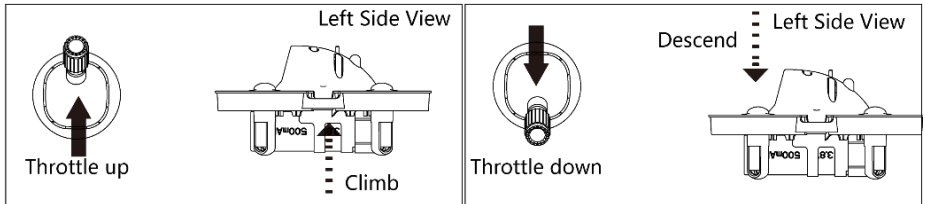
Power on the transmitter and press both button G and H immediately until the LED flashes slowly, indicating the transmitter has entered calibration mode.

1. Center all the sticks and hold for 1 second. The LED will flash quickly, indicating the medium data of sticks has recorded successfully.
2. Rotate the two sticks along its inner wall. The LED will turn solid and quit calibration mode after recording the maximum and minimum data of sticks successfully.

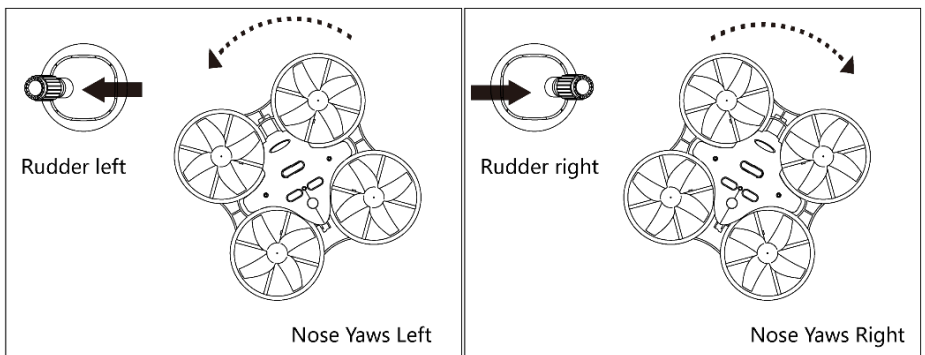
## Understanding the Primary Flight Controls

If you are not familiar with the controls of your quadcopter, take a few minutes to familiarize yourself with them before attempting your first flight.

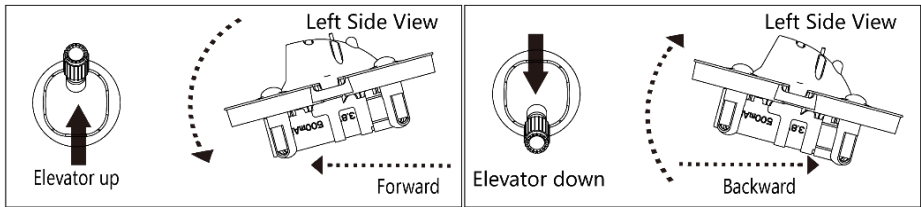
### Throttle



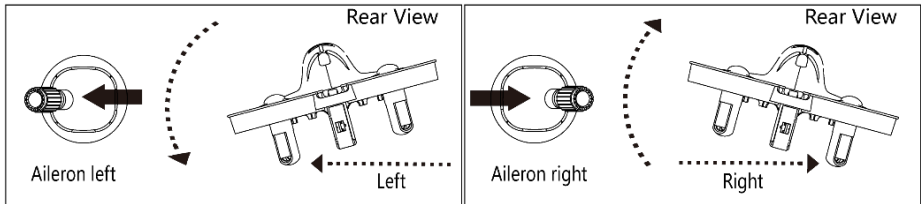
### Rudder



### Elevator



### Aileron



## Flight Mode Selection

Change flight modes by pressing different buttons on the transmitter. The quadcopter is in 6-axis mode when first powered on. The active flight mode is indicated by the LEDs at bottom of the quadcopter.

Mode	LEDs
3-axis (button D with one click)	Solid Red LED
6-axis (button D with two clicks)	Solid Red and Green LEDs
Air pressure mode (button G)	Solid Green LED

- **3-axis (Agility) mode:** the quadcopter has no bank angle limits and will not return to level flight if the sticks are released. Use rates and expo to tune the performance according to your flying style.
- **6-axis (Stability) mode:** the bank angle is limited. When the sticks are released, the quadcopter will return to level flight.
- **Air pressure (Altitude) mode:** maintains altitude. Before change to altitude mode, please make sure the aircraft remains steady. The bank angle is limited. When the sticks are released, the quadcopter will return to level flight.
- **One key flip:** don't respond when throttle too low or battery voltage too low.
- **One key revert:** keep throttle lowest.

# Fly the Quadcopter

## Takeoff

Arm the motors by pressing the arming switch. Increase the throttle until the model is approximately 2ft.(600mm) off the ground in a low-level hover and concentrate on balancing the throttle stick's position so that the quadcopter holds a steady hover altitude. In some cases, you may need to make a few short "hops" to an altitude of just a few inches until you become familiar with the control inputs and trim settings required to maintain a steady hover and altitude.

## Hovering

The quadcopter requires minor throttle adjustments to maintain its altitude in hover. Remember to keep these throttle adjustments as minimal as possible. Large adjustments could result in a loss of control or a possible crash.

While attempting to establish a low-level hover, check to see if any trim adjustments are required to keep the quadcopter from drifting in various directions. If you find that it constantly drifts without any directional control input, land the model before making any adjustments to the trim settings.

- If the nose of the quadcopter rotates to the left or right, adjust the rudder trim in the opposite direction.
- If the quadcopter continually drifts forward or backward, adjust the elevator trim in the opposite direction.
- If the quadcopter continually drifts to the left or right, adjust the aileron trim in the opposite direction.

Continue making minor trim adjustments until the machine hovers at a low altitude with very little drifting and directional control input. If this is your first multicopter or helicopter, seek the help of an experienced pilot to trim the model for you before making your first flight.

With your quadcopter properly trimmed and maintaining a stable low-level hover, practice using the rudder, elevator and aileron controls to familiarize yourself with the machine's responses to control inputs. Remember to keep the control inputs as minimal as possible.

Average flight times are approximately 6 minutes.

## Landing

To land the quadcopter, establish a low level hover. Slowly lower the throttle until the quadcopter touches down.

After landing, disarm the motors. Unplug and remove the flight battery.

To prevent excessive wear to the motors, always allow the motors to cool between flights.

**NOTICE:** Crash damage is not covered under warranty.

### Low Voltage Cutoff(LVC)

Once the battery reaches 3V under load, the ESC will continuously lower power supplied to the motor until complete shutdown occurs. This helps prevent over-discharge of the Li-Po battery. Land immediately once the ESC activates LVC. Continuing to fly after LVC can damage the battery, cause a crash or both. Crash damage and batteries damaged due to over-discharge are not covered under warranty.

Repeatedly flying the aircraft until LVC activates will damage the flight battery.

Disconnect and remove the Li-Po battery from the aircraft after use to prevent trickle discharge. During storage, make sure the battery charge does not fall below 3V per.

### Battery Level Indicator

When first powered on, the quadcopter indicates the charge level of the flight battery by lighting the LED at top of the quadcopter briefly.

LED Color	Battery Charge Level
Green	fully charged
Yellow	partially charged
Red (Low voltage alarm)	discharged

### FPV Camera and Video Transmitter

**NOTICE:** Consult local laws and ordinances before operating FPV (first person view) equipment. In some areas, FPV operation may be limited or prohibited. You are

responsible for operating this product in a legal and responsible manner.

**NOTICE:** The 25mW micro video transmitter range on your quadcopter is less than your flight control transmitter range. Ensure you have adequate video camera range for filming.

**Tips:** If you are flying with an FPV headset and are prone to motion sickness, sit in a chair. If you start to suffer from motion sickness while flying, lower your chin against your chest.

Fly in open areas, away from people, trees, cars, and buildings. The range of the system can be impacted by any obstructions blocking your signal. It is normal to see break up in the video going behind trees and other obstacles.

**Available Frequencies (MHz):**

Channel Freq. Groups	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
A	5740	5760	5780	5800	5820	5840	5840	5840
B	5845	5845	5825	5805	5785	5765	5745	5745
C	5732	5732	5732	5769	5806	5843	5843	5843
D	5733	5752	5771	5790	5809	5828	5847	5847

**Troubleshooting Guide**

Problem	Possible Cause	Solution
Will not respond to throttle	Throttle too low/The aircraft isn't bound	Reset controls with the throttle stick and throttle trim at the lowest setting

<p>Does not function and smells burnt after connecting the flight battery</p>	<p>Flight battery connected with the wrong polarity</p>	<p>Replace the 3-in-1 board. Connect the flight battery noting proper polarity</p>
<p>LED on receiver flashes rapidly and quadcopter will not respond to transmitter (during binding)</p>	<p>Transmitter too near aircraft during binding process</p>	<p>Power off the transmitter. Move the transmitter a larger distance from the aircraft. Disconnect and reconnect the flight battery to the aircraft. Follow the binding instructions</p>
	<p>Bind switch or button was not held while transmitter was powered on</p>	<p>Power off transmitter and repeat bind process</p>
	<p>Aircraft or transmitter is too close to large metal object, wireless source or another transmitter</p>	<p>Move aircraft and transmitter to another location and attempt binding again</p>
<p>LED on the receiver flashes rapidly and the quadcopter will not respond to the transmitter (after binding)</p>	<p>Low voltage of the transmitter batteries</p>	<p>Replace the transmitter batteries</p>
	<p>The quadcopter is bound to a different model memory</p>	<p>Select the correct model memory on the transmitter. Disconnect and reconnect the flight battery to the</p>

		quadcopter
	Flight battery or transmitter battery charge is too low	Replace or recharge batteries
	Aircraft or transmitter is too close to large metal object, wireless source or another transmitter	Move aircraft and transmitter to another location and attempt connecting again
Crashes immediately upon lift-off or doesn't lift off	Propellers in wrong locations	Make necessary adjustments
Static in FPV feed	Interference on chosen channel	Change the video transmitter and receiver channel

## FCC Information

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.

**NOTE:** The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

**NOTE:** 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.

 **NOTICE**

**Changes or Modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.**

This product contains a radio transmitter with wireless technology which has been tested and found to be compliant with the applicable regulations governing a radio transmitter in the 2.400GHz-2.4835GHz and 5725MHz-5850MHz frequency range. Drone Rated power: 5dBm, Remote Controller Rated power: 5dBm, 5.8G FPV Camera Rated power: 14dBm.

## **Compliance Information for the European Union**

 **EU Compliance Statement**

Hereby, Mirarobot declares that the radio equipment type S85 FPV RTF is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: [www.mirarobot.com](http://www.mirarobot.com).

This device may be used in each member state.

 **Instructions for disposal in the European Union**

This Product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collections point for the recycling of waste electrical and electronic



equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and make sure that it is recycle in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

**RF warning statement**

The device has been evaluated to meet general RF exposure requirement. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

**CAUTION RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS**



**WARNING**

ALL INSTRUCTION AND PRECAUTIONS MUST BE READ  
AND FOLLOWED EXACTLY.

WARNING: PROCEDURES, WHICH IF NOT PROPERLY FOLLOWED, CREATE THE PROBABILITY OF PROPERTY DAMAGE, COLLATERAL DAMAGE AND SERIOUS INJURY OR CREATE A HIGH PROBABILITY OF SUPERFICIAL INJURY.

Failure to exercise care while using this product and comply with the following conditions and guidelines could result in product malfunction, excessive heat, fire, property damage, and ultimately injury.

Lithium Ion batteries are not toys. For the purposes of this document Li-Ion, Li-Po or Li-Fe batteries will be described as "Batteries".

## Handling and Storage

- **Never** alter, puncture or impact Batteries or related components.
- Do not directly connect the terminals with metal objects. This will short-circuit Batteries, resulting in heat and electrical discharge.
- **Never** store loose Batteries together, the Batteries' terminals may contact one another causing a short circuit.
- **Never** expose Batteries to extreme temperatures or direct sunlight.
- **Always** disconnect Batteries when not in use.

## Additional Guidelines and Cautions

- In the event of a crash, always quickly and safely disconnect and remove Batteries from the model. Then follow the previously listed safety procedures.
- If the internal contents of Batteries come into contact with your skin, wash the affected area(s) with soap and water immediately.
- If it comes into contact with your eye(s), flush them with generous amounts of water for 15 minutes and seek immediate medical attention

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