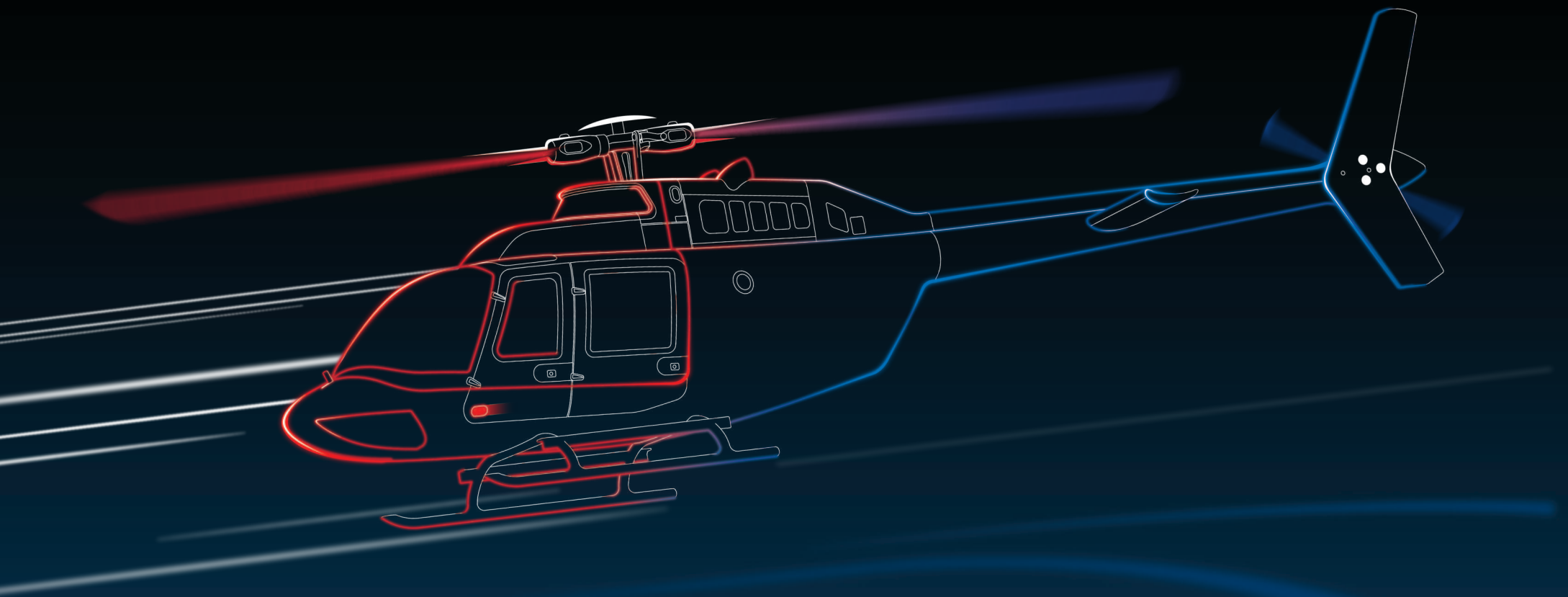
# BELL-206 ACE

FLY WING

SMART
RC HELICOPTER



**User Manual**

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* To ensure flight safety, please comply with local laws and regulations.

# READING TIPS

## Legend

Important

Hints and Tips

## Read Before the First Flight

It is recommended to first watch the instructional videos and read the User Manual. Use this product safely in a manner required by local laws and regulations.

## Tutorial Videos

Use the link below, or scan the QR codes to watch the tutorial videos to ensure proper and safe use of the product :

https://flywingrc.com/



OFFICIAL WEBSITE

YOUTUBE

TIKTOK

## Download the Software (Optional)

Download the relevant software (if applicable) for flight control setup from the address below:

https://flywingrc.com/pages/software-downloads

The operating temperature range of this product is -10°C to 40°C. It does not meet the standard operating temperature for military-grade application (-55°C to 125°C), which requires higher environmental adaptability. Please operate the helicopter appropriately only in environments that meet the specified requirements.

# TABLE OF CONTENTS

## PRODUCT OVERVIEW


Important Introduction 01
Getting Started 02
Preparing the Helicopter 02
Preparing the Transmitter 03
Transmitter Functions 04
Outdoor Flight 05
Function Introduction 09
GPS Mode 09
Freedom Mode 09
Attitude (ATT) Mode 09
6G Mode 09
Manual Mode 10
One-Key Return-to-Home 10
Low-Battery Return-to-Home 11
Compass Calibration 12
Coordinated Turn 14
Three-Speed Control 14
Soft Take-Off/Land 14
Auto Routing 15


## FLIGHT SAFETY


Pre-Flight Checklist 16
Safety Guidelines 17
Disclaimer and Warnings 19


## APPENDIX

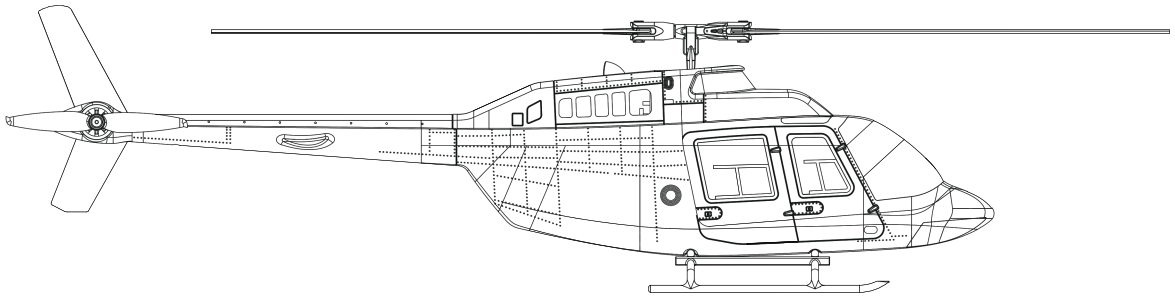

Advanced Parameter Explanations 19
LED Flight Status Indicators 20
Binding the Transmitter 21

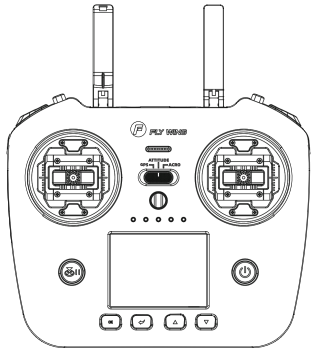
# PRODUCT OVERVIEW

## Important Introduction

FLYWING BELL-206 ACE Smart RC Helicopter is equipped with a multi-link GNSS system supporting GPS, BDS, GLONASS, and Galileo. It provides stable outdoor hovering and supports One-Key Return-to-Home and Low-Battery Return-to-Home.

FLYWING BELL-206 ACE Smart RC Helicopter is equipped with a customized 2.4 GHz transmitter, providing a maximum control range of 2 km* in interference-free and unobstructed environments. If the transmitter signal is lost due to excessive distance, the helicopter will automatically Return to Home (RTH). During RTH, you can cancel the process by pressing the RTH button and manually regain control of the helicopter.





* The maximum communication distance is measured under FCC standards in an unobstructed environment without electromagnetic interference, with the helicopter flying at an altitude of approximately 120 m. The measured distance represents the maximum one-way transmission range of the transmitter without triggering Return-to-Home.

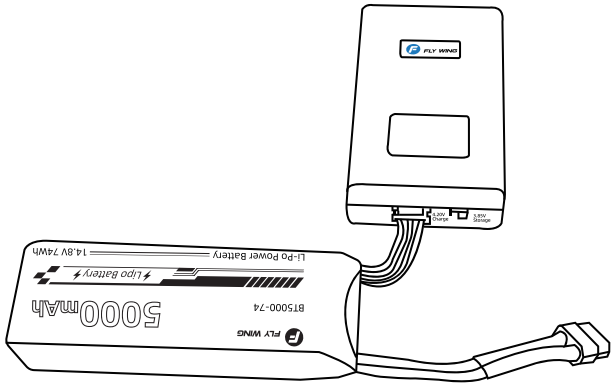
This helicopter has no relevant flight restrictions. Please use this product in compliance with local laws and regulations.

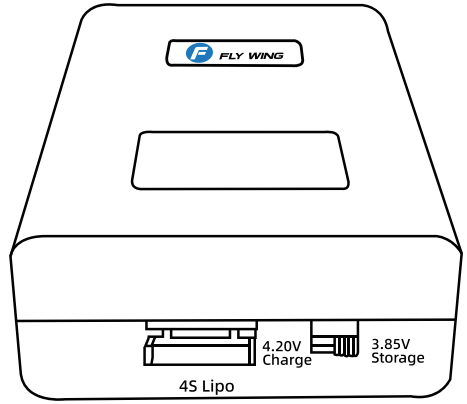
# Getting Started

Visit the link or scan the QR code to watch tutorial videos.
https://www.flywingrc.com

## ■ Preparing the Helicopter

Charge the flight battery before each flight. Connect the supplied charger to the battery plug, set the charger mode switch to Charge mode, and connect the charger to an AC power source to begin charging. The battery is fully charged when the screen displays “99”.



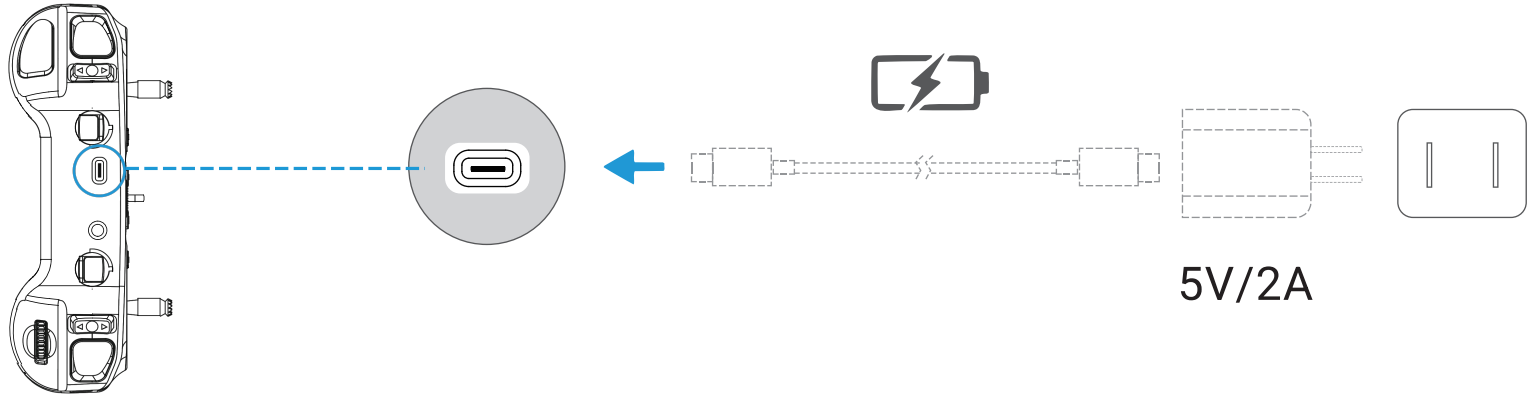




If the battery will not be used for more than 5 days, it is recommended to use the charger's Storage mode for battery storage. Check and perform this operation once a month.

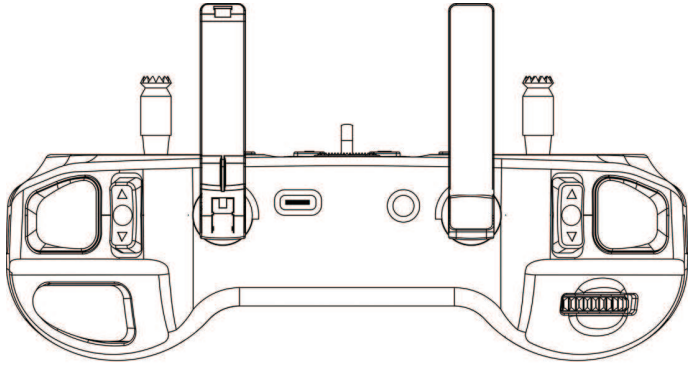
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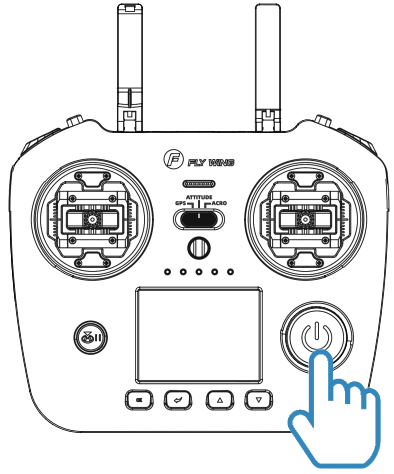
## ■ Preparing the Transmitter

Check the transmitter battery level before each flight. Short press the power button to check the battery level. If the battery level is low, use a USB-C charger to charge the transmitter.




Pull out and rotate the antennas. Position them vertically. Short press the power button once and release, then long press it for about 5 seconds to power on the transmitter. To turn off the transmitter, unplug the helicopter battery first, then long press the transmitter's power button.

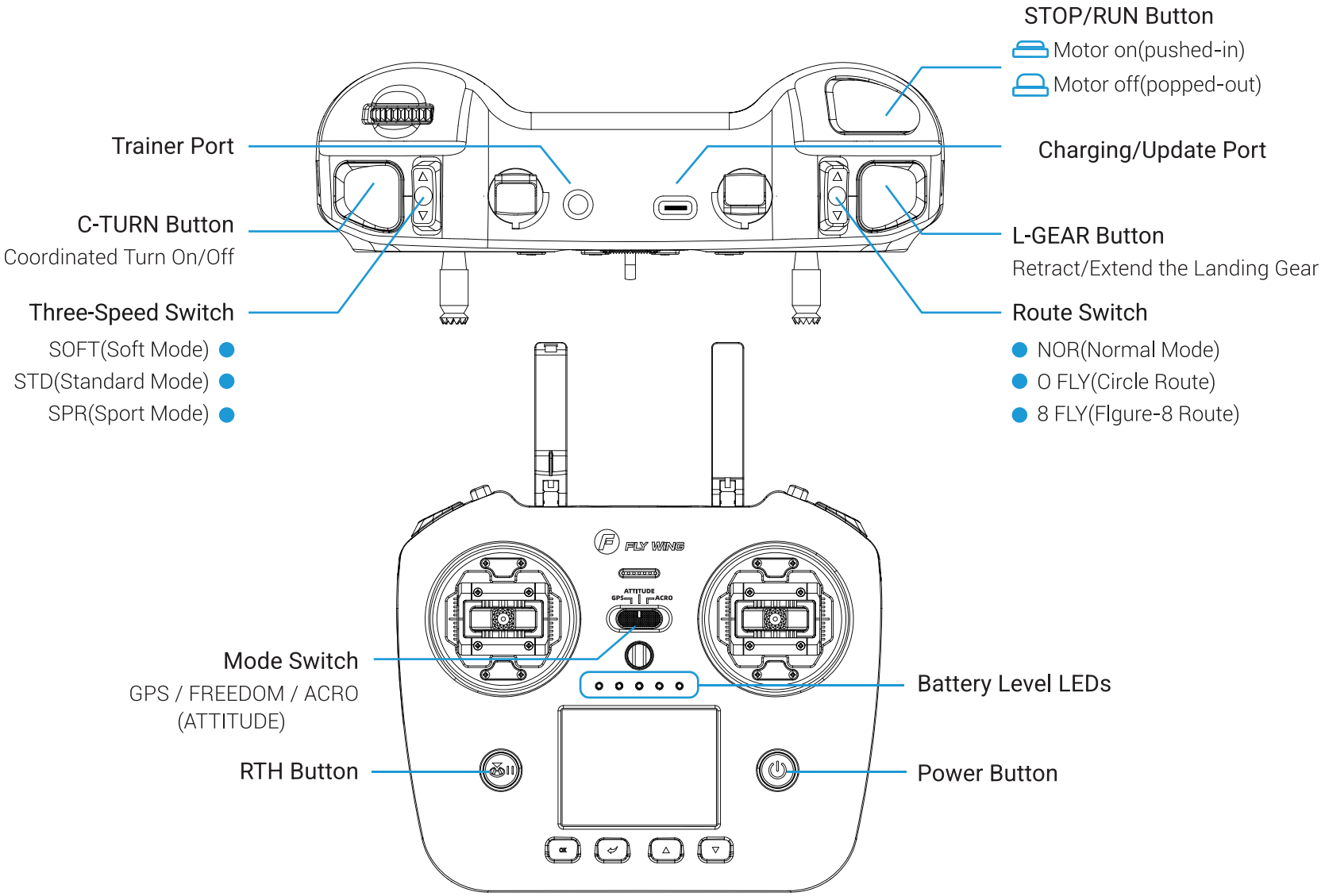




## ■ Transmitter Functions

Before powering on, make sure:

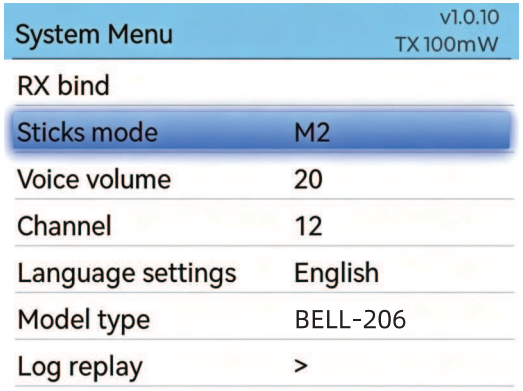
Mode Switch: set to GPS Mode;  RUN/STOP Button: set to STOP (popped-out position);  Three-Speed Switch: set to SOFT;  Route Switch: set to NOR

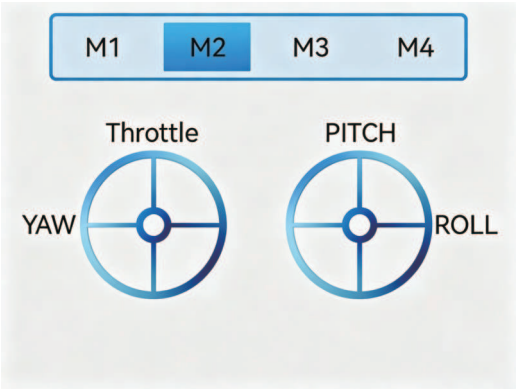



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## ■ Switching Between M1/M2

Short press the OK button to enter the System Menu. Select Sticks mode and short press the OK button to enter the selection menu. Use the Up/Down buttons to select the desired stick mode, then press the OK button to confirm. The transmitter will automatically return to the previous menu.



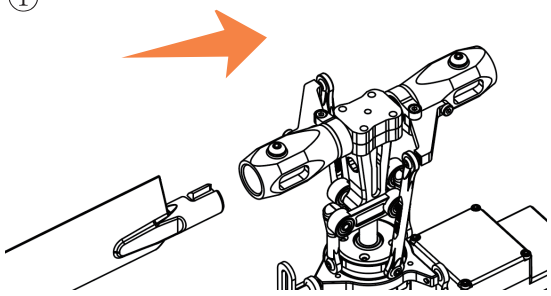




# Outdoor Flight

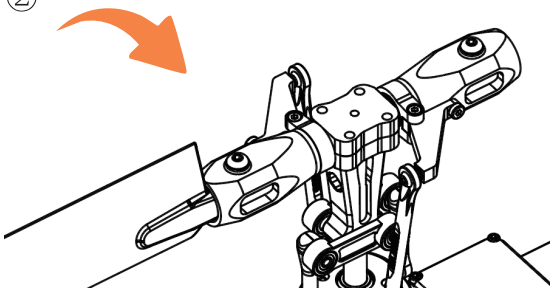
## ■ Installing the Blades

Insert the blade with the indentation facing up into the rotor holder. Rotate the blade 90° clockwise, then pull it outward to confirm the spring snaps back and the blade is securely in place.

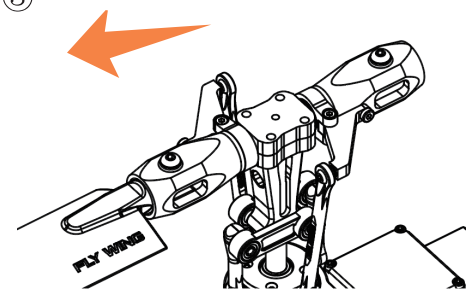
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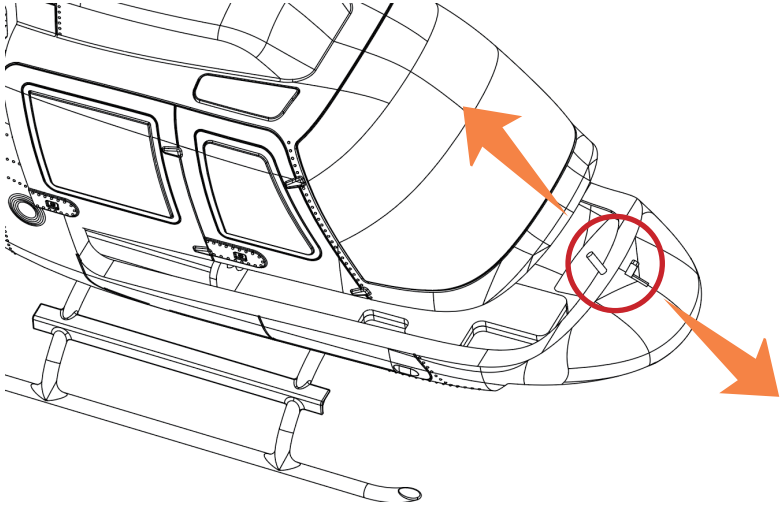
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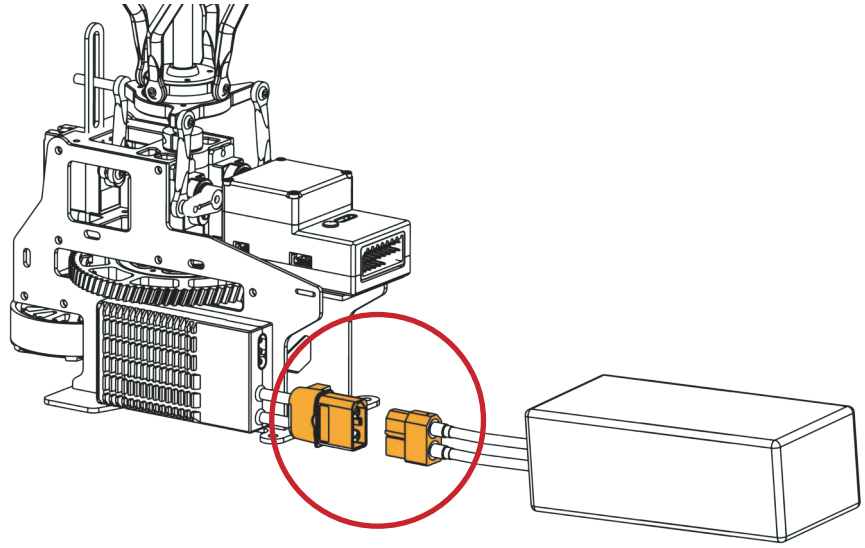


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## ■ Powering On the Helicopter

Power on the transmitter. Remove the front canopy of the helicopter by pressing the latch down. Secure the battery to the internal wooden mounting plate. Plug the yellow XT60 battery connector into the ESC to power on the helicopter. Close the canopy. Ensure the latch is securely closed. Place the helicopter on the ground, and keep it still. Wait for the servos to move and complete the self-check.





## ■ Pre-Flight Check

Make sure the transmitter Mode switch is in GPS Mode and place the helicopter in an open area. Wait for satellite searching to complete. When the helicopter's green LED stays solid, the transmitter screen will display “Ready to fly”.

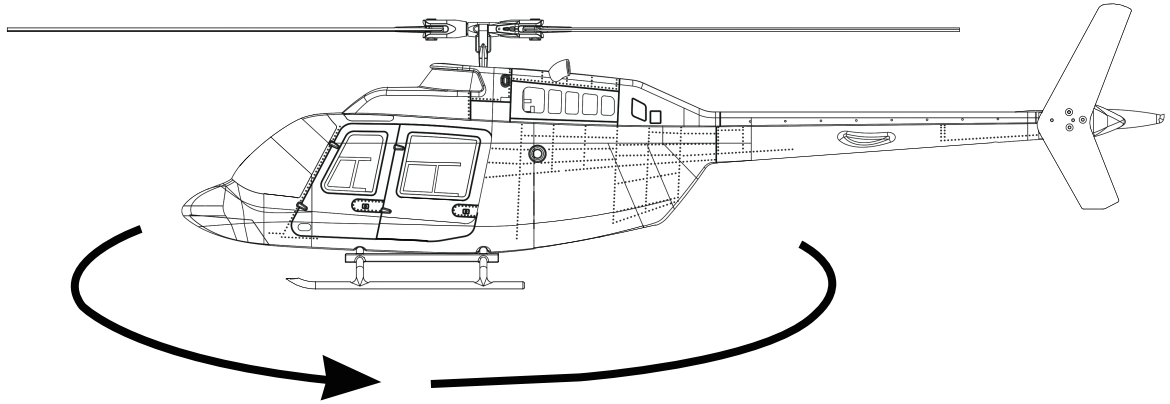
Hold the helicopter and rotate it horizontally 360°. Check whether the green LED turns yellow or red, or whether “Compass inter” appears in the upper-left corner of the transmitter screen. If the green LED remains solid and no warning appears on the screen, the compass is functioning normally and the helicopter is ready for takeoff.

(It is recommended to wait one minute after the green LED turns on to allow the home point to refresh more accurately.)

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If the LED flashes yellow or red at a certain angle, or the transmitter displays “Compass inter”, recalibrate the compass. Refer to the Compass Calibration section for details.

Move the sticks to check if the servos operate normally and check the mechanical components for any abnormalities. After confirming everything is normal, prepare for takeoff.



## ■ Takeoff

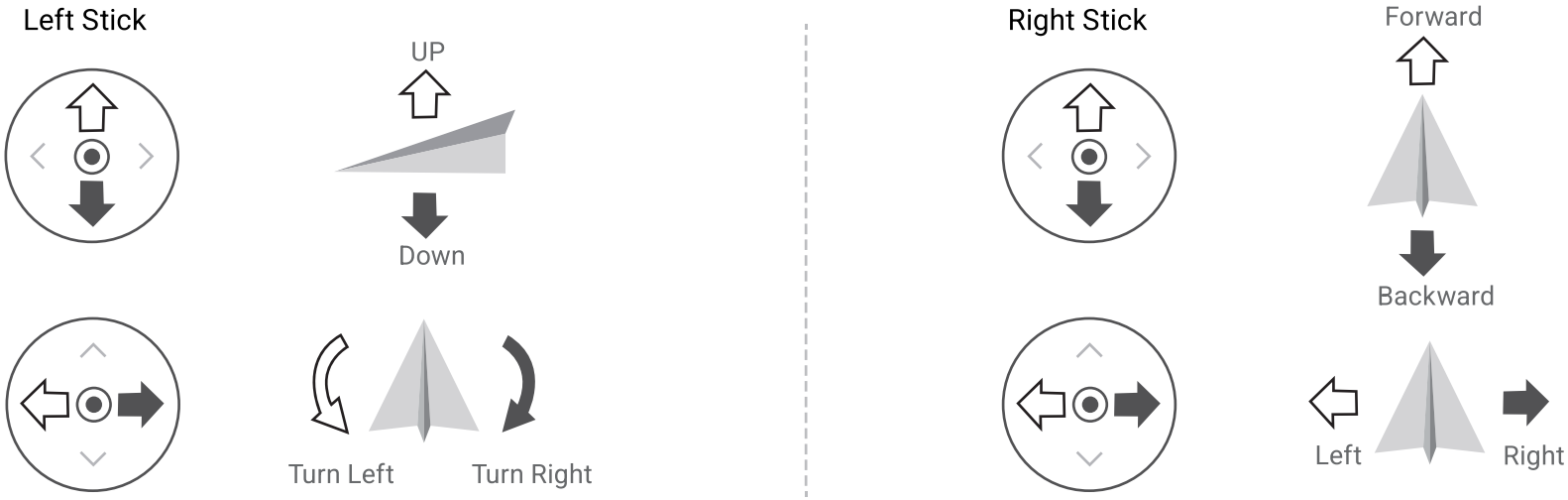
Make sure the transmitter Mode switch is in GPS Mode and the helicopter is placed in an open area. Check the flight environment and confirm that the screen displays “Ready to fly”.

Move both sticks outward to arm the flight control. The flight controller LED will flash green and the voice prompt will announce “Home point updated.”

During the flashing period, press the STOP/RUN button. The rotor will begin to spin up slowly. After about 10 seconds, when the rotor speed becomes stable, push the throttle stick upward and hold it for 2 seconds to take off. Release the stick, and the helicopter will hover.




Take Mode 2 (left-hand throttle) as an example.




## ■ Landing

Make sure the helicopter is flying over an open area. Check the flight environment and confirm it is safe before landing. Pull down the throttle stick gradually. Do not pull it all the way down. The helicopter will slowly descend until it lands.

After a stable landing, slowly release both sticks. Wait about 3 seconds, or directly press the STOP/RUN button to the STOP position and wait for the motors to stop.

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# Function Introduction

The ACRO switch position on the transmitter can be reassigned to other flight modes. Power on both the helicopter and transmitter. Long press the OK button to open the Helicopter Parameters menu. Use the UP / DOWN buttons to select the Acro Mode menu. Short press OK to enter this menu, then you may make your modifications.

## ■ GPS Mode

The flight controller uses GPS positioning to help maintain the helicopter's position and attitude. When the sticks are released, the helicopter will hold its position in the air. This mode is recommended for beginners, providing an intuitive and effortless flying experience for everyone.

## ■ Freedom Mode

The flight controller provides a smoother flight profile by minimizing the braking force normally experienced in GPS Mode. It maintains hover capability while significantly allowing an open yet stable flying experience. Blending the safety of GPS and the fluid motion of ATT Mode, Freedom Mode allows a realistic flight experience. When the sticks are released during forward flight, the helicopter will coast at an almost level attitude and gradually come to a stop, instead of continuously drifting as it does in ATT Mode.

## ■ Attitude (ATT) Mode

The helicopter is limited from excessive roll or pitch, making it impossible to inadvertently flip the helicopter. The flight controller continues to stabilize the helicopter and provides altitude-hold function, but does not provide position hold as you would experience while in GPS Mode. When the sticks are released, it can drift with wind and momentum.

## ■ 6G Mode

Similar to ATT, the helicopter is limited from excessive roll or pitch, making it impossible to inadvertently flip the helicopter. The flight controller continues to stabilize the helicopter, while the pilot has direct control over the helicopter's movement and collective pitch. The pilot is responsible for maintaining the desired attitude, as it is not automatically maintained. Reducing collective too much can cause the helicopter to descend and impact the ground. 6G Mode provides an advanced level of control as you transition from GPS flight to manual flight.

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## ■ Manual Mode

The flight controller provides essentially no automatic attitude stabilization. The pilot has direct control of the helicopter and must manage its attitude and flight dynamics manually.

## ■ One-Key Return-to-Home

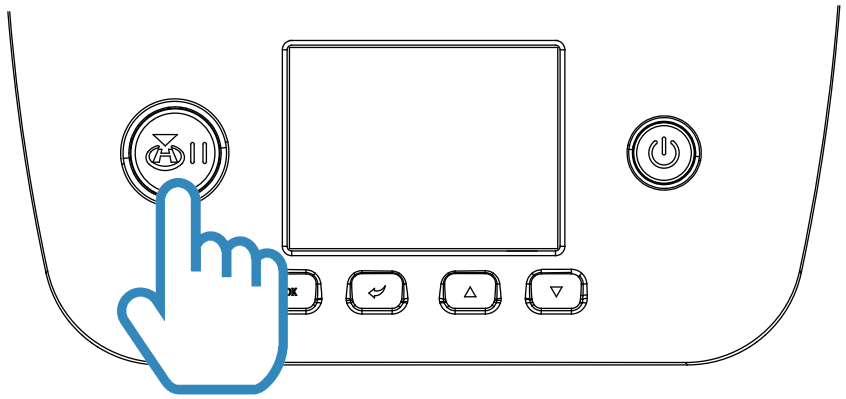
Make sure the helicopter is flying over an open area. Check the flight environment and confirm it is safe. Press the RTH button. All indicators (the flight controller LED and external LEDs) will turn solid purple. The helicopter will select different RTH modes based on the distance between its current position and the home point.

Current position within 10 m of the home point:

- If the current altitude is below 5 m, the helicopter will ascend to 5 m and return.
- If the current altitude is 5 m or higher, the helicopter will return at the current altitude.

Current position more than 10 m of the home point:

- If the current altitude is below 15 m, the helicopter will ascend to 15 m and return.
- If the current altitude is 15 m or higher, the helicopter will return at the current altitude.



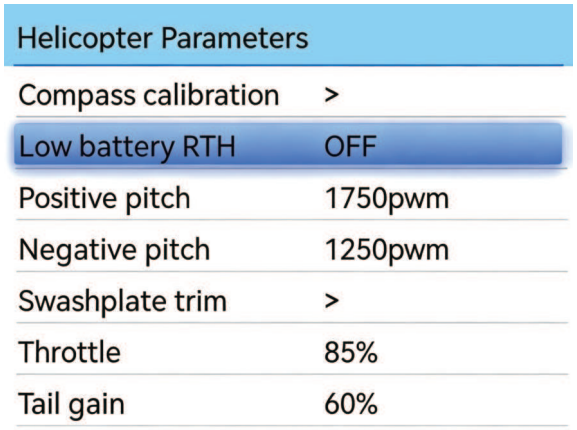
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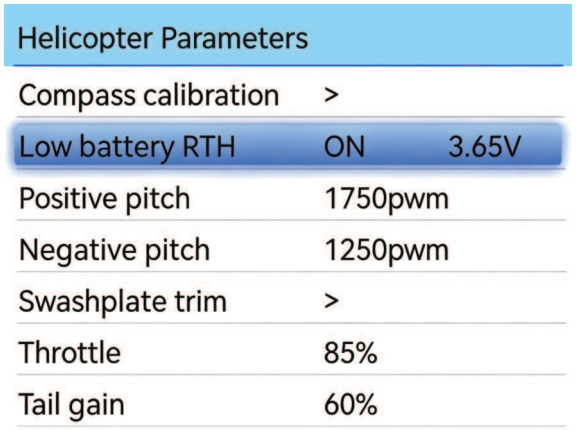
The home point is the location where the helicopter is armed and takes off. The RTH accuracy depends on the GPS satellite signal quality during takeoff. Under good satellite signal conditions, the home point accuracy is approximately 2 m.
Before takeoff, it is recommended to wait until the screen displays "Ready to fly" and the flight controller LED stays solid green. Then wait for another 1 minute to allow the satellite signal to stabilize before arming and taking off.
During RTH, the helicopter cannot be controlled during the ascent, return flight, or high-speed descent phases. When the helicopter descends to approximately 10 m above the ground and enters the slow descent phase, only roll input is available to fine-tune the landing position.

## ■ Low-Battery Return-to-Home

The BELL-206 ACE supports 4S LiPo batteries. When the helicopter battery level is low, the helicopter will automatically trigger low-battery protection. The LED indicators will turn purple as a warning, and RTH will be triggered within several tens of seconds. Refer to One-Key Return-to-Home for the RTH process.

Low battery RTH is disabled by default. Long press the OK button on the transmitter to enter the Helicopter Parameters menu. Select Low battery RTH, then use the OK and Up/Down buttons to enable the function or set the RTH voltage. The minimum RTH voltage is 3.6 V/cell.




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When using a 4S LiPo battery with the default settings:

- When the battery voltage drops below 14.4 V, the helicopter triggers Level 1 Low Battery RTH. All LED indicators will turn solid purple, and RTH will be initiated. Users can cancel the current RTH by briefly pressing the RTH button. All LED indicators will flash yellow and green rapidly (yellow and blue rapidly flashing in ATT Mode)

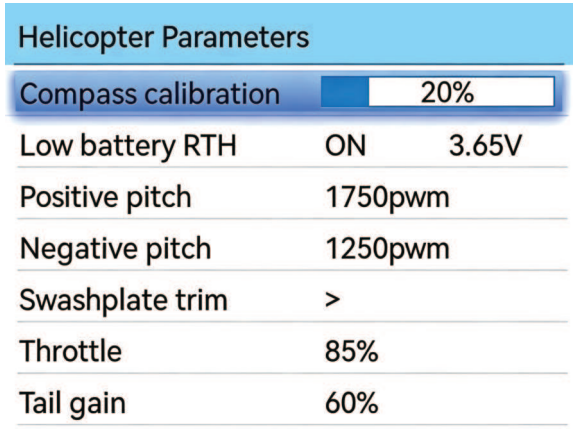
- When the battery voltage drops below 14.2 V, the helicopter triggers Level 2 Low Battery Protection. All LED indicators will turn solid purple, and the helicopter will perform a forced landing. This action cannot be canceled by users.

## ■ Compass Calibration

Select an open area and calibrate the magnetometer according to the steps below. For more information about magnetometer calibration, visit the official website: www.flywingrc.com and watch the instructional video.

Method 1: Transmitter Calibration

- Long press the OK button for 3 seconds. Short press the Up/Down buttons to select “Compass calibration” in the menu, then press the OK button to start calibration. A progress bar will appear.




- Rotate each side of the helicopter for at least 2 rotations, and calibrate all six sides in sequence. The flight controller LED will gradually change from solid red to green.

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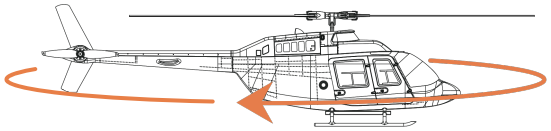
When calibration is complete, the progress bar will display 100%. The flight controller LED will stay solid, then turn off, and the helicopter will automatically restart.

During restart, the LED will flash red rapidly, then turn off for several seconds. Finally, the LED will flash red and blue rapidly, indicating that restart is complete.

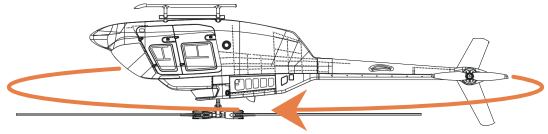
Flight Controller LED
Fast Red/Green flashing → Fast Yellow flashing → Fast Blue flashing → Fast Green flashing → Solid Green → Automatic restart

External LEDs
Solid Red → Solid Orange → Solid Yellow → Solid Green → Automatic restart

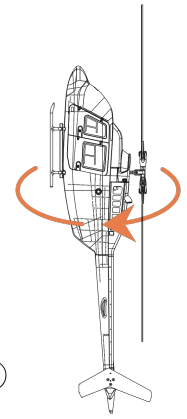
During the restart process, place the helicopter on the ground and keep it still. Wait for the flight controller to complete the self-check.
(DO NOT hold the helicopter in your hand.)



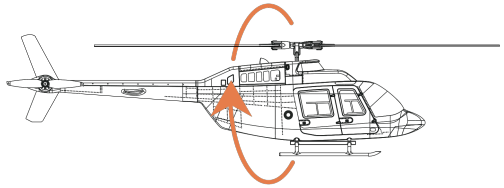
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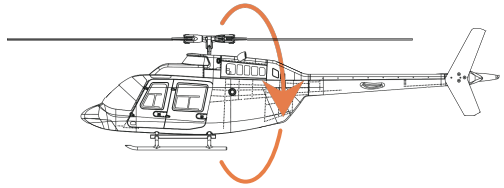
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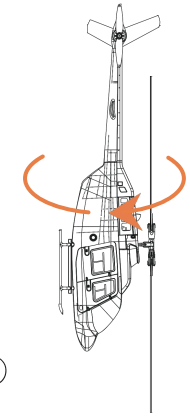
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## Coordinated Turn

The BELL-206 ACE has the Coordinated Turn function enabled by default. When using the YAW stick (Left stick left/right in Mode 2) to turn, the flight control system automatically adjusts roll control based on the current flight speed. This helps the helicopter achieve tighter turns with a more realistic and smoother flight attitude.



This function is enabled by default in GPS Mode and ATT Mode.

## Three-Speed Control

The helicopter features three built-in flight sensitivity levels, which can be switched by using the Three-Speed switch.

- In Soft Mode (SOFT), the helicopter's flight speed, flight angle, and response speed are limited. It will fly very slowly.This mode is suitable for beginners to get familiar with helicopter operation.
- In Standard Mode (STD), the helicopter provides higher flight speed, flight angle, and response speed compared with Soft Mode. This mode is suitable for daily flights.
- In Sport Mode (SPR), the helicopter reaches the maximum values of the flight control system for maximum flight speed, maximum flight angle, and response speed. The helicopter becomes highly responsive with faster flight speed. This mode is recommended for experienced pilots flying in open areas.

## Soft Take-Off/Land

During takeoff and landing, this function allows the flight control system to fully control the vertical speed. When the 1-meter altitude above ground is reached, control switches over to transmitter-based proportional control.

This function helps prevent the helicopter from ascending too quickly during takeoff.

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During takeoff, except for the throttle stick, other stick controls remain unaffected.

(Since the altitude above ground is estimated based on barometric pressure, accuracy may be affected under strong wind conditions.)

## ■ Auto Routing

The helicopter features two built-in automatic routes: Circular Route (O FLY) and Figure-8 Route (8 FLY), which can be switched by the Route switch on the transmitter (the LED indication is the same as GPS Mode).

- In Circle Route (O FLY), the helicopter points its nose toward the circle center and repeatedly flies a circular route. The circle diameter is 15 m. Make sure the flight area is sufficiently open. Flight speed varies depending on the selected Three-Speed Control setting. The Coordinated Turn function is supported.

- In Figure-8 Route (8 FLY), the helicopter flies a horizontal figure-8 route. Each circle has a diameter of 15 m. Make sure the flight area is sufficiently open. Flight speed varies depending on the selected Three-Speed Control setting. The Coordinated Turn function is supported.

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# FLIGHT SAFETY

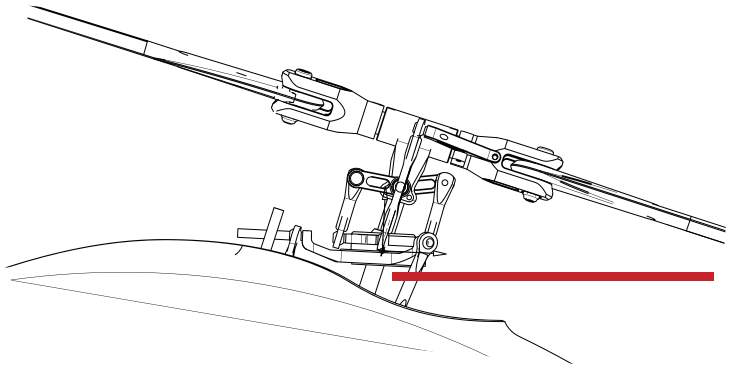
## Pre-Flight Checklist

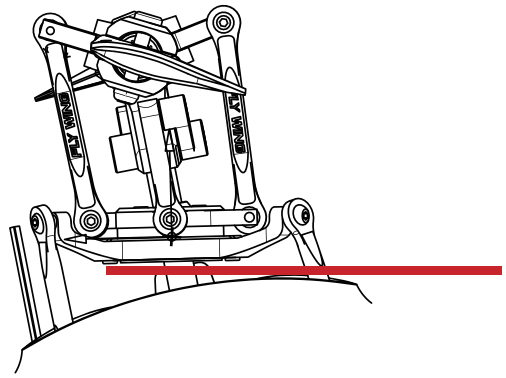
### Installation and Component Check

- Make sure all modules are installed correctly and securely.
- Make sure the wiring of the ESC, receiver, and other components is correct and secure.

### Operating Status Check

- Make sure the LED status indicators (flight controller LED and external LEDs) correspond to the Mode switch position.
- Make sure the sensor parameters are normal and calibrate according to the prompts.
- Before takeoff, gently shake the helicopter to check whether it remains level and whether the correction is functioning properly.





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# Safety Guidelines

It is strongly recommended to fly in a safe and appropriate environment. Proper flight safety awareness is essential for ensuring the safety of yourself, others, and the environment. Users should ensure that they have sufficient knowledge of the helicopter and understand all emergency procedures before flight.

## Environment

- Fly in open areas away from people, roads, ground facilities, property, airports, other aircraft, and obstacles.
- The maximum flight altitude depends on the helicopter's performance. High-altitude environmental factors may affect the battery and power system, resulting in reduced helicopter performance. Always understand the capabilities of your helicopter and fly with caution.
- The operating temperature range of the flight controller is -10°C to 45°C (without direct sunlight).
- Fly only in good weather conditions (no rain, strong winds, or extreme weather) and during the daytime or in environments with sufficient lighting.
- Fly only in areas where flight is permitted by local regulations.

## Inspection

- Make sure all devices have sufficient battery power.
- Make sure the rotor blades are not damaged and are securely installed.
- Make sure all helicopter components are clean and free from damage.
- Make sure all modules of the flight control system are securely installed and do not directly contact other metal or conductive materials. Ensure that the installation position and orientation are correct. Check that all wiring is properly connected and secure, all connectors are firmly attached, and all cables are properly organized and secured. DO NOT pull the cables when disconnecting connectors.

## Operation

- DO NOT approach rotating rotor blades or motors while they are operating.

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- Make sure the helicopter remains within visual line of sight (VLOS) during flight. If necessary, assign an observer to assist you in monitoring the helicopter's position.
- DO NOT transport dangerous goods or prohibited items.
- Avoid extreme maneuvers during flight to prevent overloading the helicopter.
- Pressing the STOP/RUN switch during flight will cause the helicopter to crash. Use this function only in emergency situations.
- DO NOT make phone calls or send text messages during flight. DO NOT operate the helicopter while under the influence of alcohol or drugs.
- When a low battery (or low voltage) warning is triggered, return the helicopter as soon as possible.
- The helicopter will not automatically avoid obstacles during auto Return-to-Home. If the transmitter signal is normal, you can cancel the RTH procedure using the transmitter.
- After landing, turn off the helicopter first, then turn off the transmitter to prevent signal loss and accidental activation of RTH.
- DO NOT use this product to throw or launch any dangerous objects toward buildings, people, or animals.

## Maintenance

- Regularly check the status of the flight control system modules.
- The flight control system is suitable for long-term storage in a dry environment at 5°C to 35°C, away from heat sources, vibration, strong magnetic fields, and strong electric fields.
- Do not store the product in high places to prevent accidental falls that may cause damage or malfunction.

## Flight Restrictions and Local Regulations

- DO NOT fly in restricted flight zones.
- It is recommended to keep the flight altitude below 120 m and strictly comply with local laws and regulations during flight.

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## Disclaimer and Warnings

This product is not a toy and is not intended for use by individuals under 18 years old. Keep this product out of reach of children. Always exercise extra caution when operating this product in the presence of children.

Please read this document carefully before using this product. This disclaimer is important for ensuring safe operation and protecting your legal rights and interests.

This product is a helicopter flight control system. When the power supply is functioning properly and all components are undamaged, it provides safe and reliable flight control. Visit www.flywingrc.com for the latest disclaimer and warnings. FLYWING reserves the right to update this disclaimer. For the latest version of this disclaimer, please refer to the version published on the official FLYWING website.

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# APPENDIX

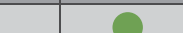
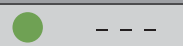
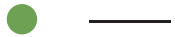
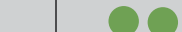
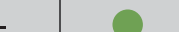
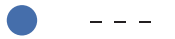
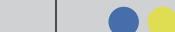
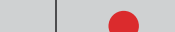
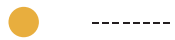
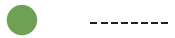
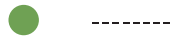
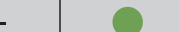
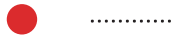
## Advanced Parameter Explanations

FLYWING strongly recommends that users do not modify the parameters on this page unless necessary. These parameters have been factory tuned.

- Throttle: the percentage value of the helicopter rotor speed.

- Pitch Gain: the correction gain for the helicopter's forward and backward movement.
- Roll Gain: the correction gain for the helicopter's left and right movement.
- Tail Gain: the correction gain for the helicopter's left and right yaw rotation.
- Braking Gain: the braking force applied when the helicopter brakes and hovers after the stick is released.

## LED Flight Status Indicators

| Mode | Flight Controller LED Status | External Left LED Status | External Right LED Status | Description |
|---|---|---|---|---|
| GPS Mode |  |  |  | Disarmed Status, Acquiring GPS Satellite Positioning |
| |  |  |  | GPS Satellite Positioning Completed, Ready to Arm |
| |  |  |  | Armed Status |
| |  |  |  | Battery Voltage Abnormal |
| ATT Mode |  |  |  | Disarmed Status, Ready to Arm |
| |  |  |  | Armed Status |
| |  |  |  | Battery Voltage Abnormal |
| RTH Mode |  |  |  | Return-to-Home (RTH) Mode |
| Compass Calibration |  |  |  | Calibration Progress: 0–25% |
| |  |  |  | Calibration Progress: 25–50% |
| |  |  |  | Calibration Progress: 50–75% |
| |  |  |  | Calibration Progress: 75–99% |
| |  |  |  | Calibration Complete |
| Error Status |  |  |  | Acceleration Abnormal |
| |  |  |  | Compass Abnormal |
| |  |  |  | Transmitter Abnormal |
| |  |  |  | Level 1/2 Low Battery Warning |
| |  |  |  | Battery Level Below 75% |

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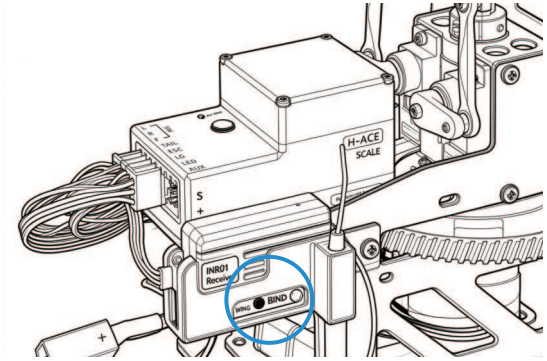
LED Flashing Pattern Explanation

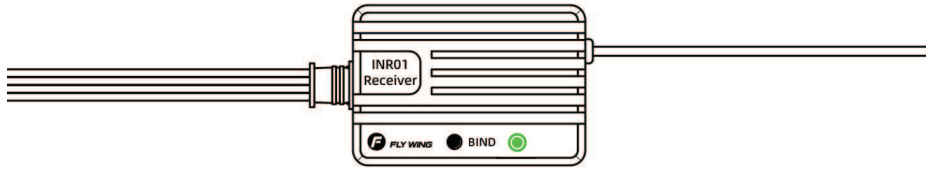
- – – – Slow flashing, approximately once per second.
- ---------- Fast flashing, approximately once every 0.25 seconds.
- ····· Rapid flashing, extremely fast flashing.
- ——— Solid on, continuously illuminated.

## Binding the Transmitter

When the transmitter and INR01 receiver are purchased as a set, they are bound at the factory and can be used directly after powering on and activation. In other cases, follow the steps below to bind the transmitter and receiver.

- Connect the receiver to the flight controller.
- Power on the helicopter and the transmitter.
- Press and hold the BIND button on the receiver for about 4 seconds until the green LED flashes rapidly, then release the button.
- Short press the OK button to open“System Menu”, then select “RX bind”.
- When the receiver LED turns solid green, the transmitter displays “Success.”



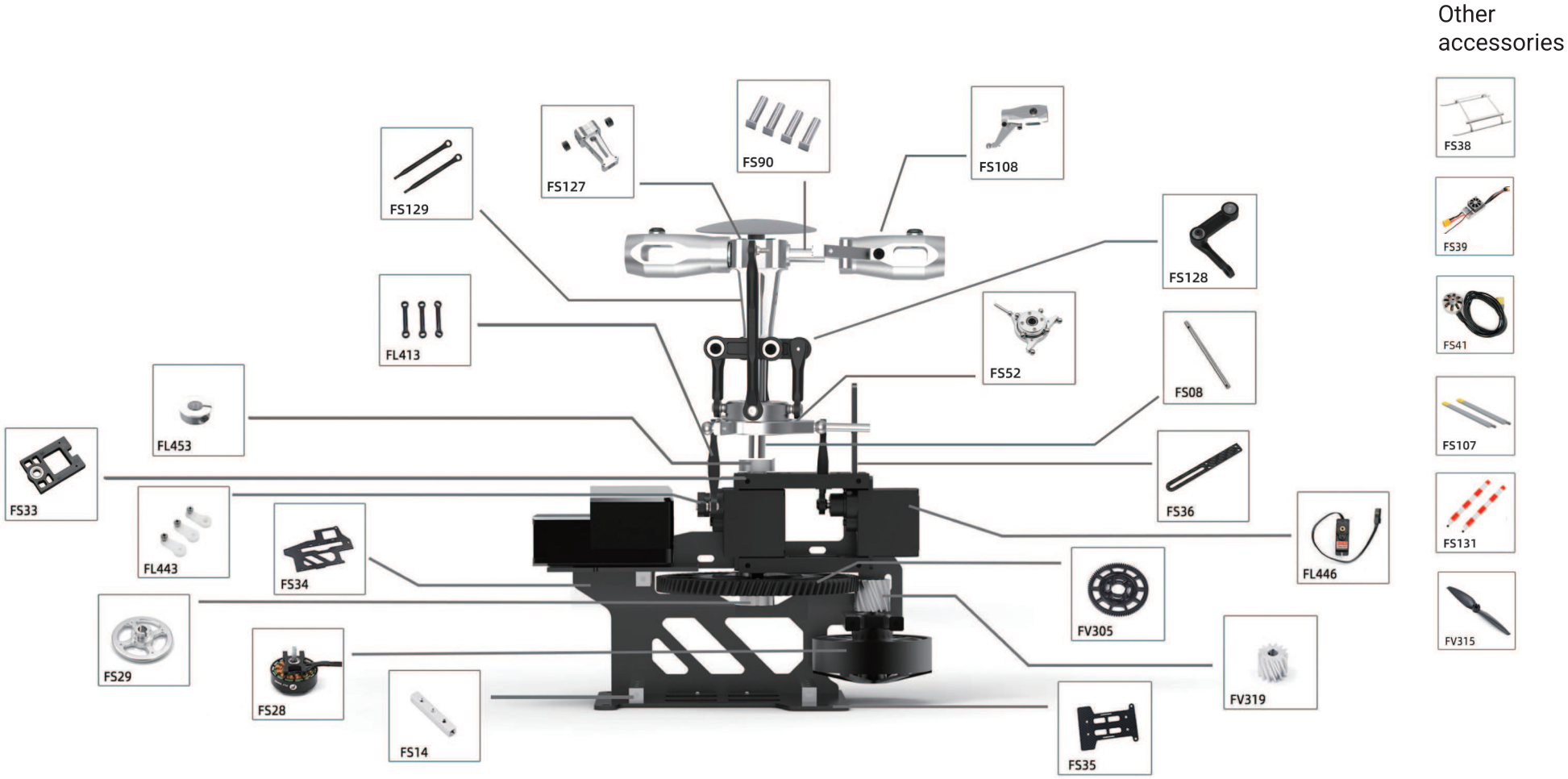

> Rapidly flashing green: Binding in progress.

> Slowly flashing green: Transmitter not connected.

> Solid green: Transmitter connected.

- During binding, keep the transmitter and receiver within 0.5 m of each other.
- The transmitter remembers previously bound receivers and automatically connects to them when they are powered on.
- If binding fails, power off the receiver, move it within 0.5 m of the transmitter, and try again.

# ACCESSORY INFORMATION TABLE




## Accessory Name

| | |
|---|---|
| FS08 | Main Shaft |
| FS14 | Aluminum Column |
| FS28 | Main Motor |
| FS29 | Main Gear Fixed Plate |
| FS33 | Main Shaft Mount |
| FS34 | Side Frame Plate |
| FS35 | Bottom Plate |
| FS36 | Anti Rotation Bracket |
| FS38 | Landing Skid |
| FS39 | 60A ESC |
| FS41 | Tail Motor |
| FS52 | Swashplate |
| FS90 | Feather Shaft |
| FS107 | Quick Main 2 Blades |
| FS108 | Rotor Holder |
| FS127 | Main Rotor Housing |
| FS128 | Phase Arm |
| FS129 | Pitch Linkage |
| FS131 | Quick Main 2 Blades |
| FV305 | Main Gear |
| FV315 | Tail Blade |
| FV319 | Motor Gear |
| FL413 | Swashplate Linkage Rod Set |
| FL443 | H041 Servo Arm |
| FL446 | H041 Servo |
| FL453 | Main Shaft Fixed |

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Latest User Manual on the official FLYWING website.

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