SANLIANHUAN

AGES 14+

USER MANUAL

http://www.cxhobby.com

MADE IN CHINA

Specifications:

Main Rotor Dia. : 241mm
Tail Rotor Dia. : 41mm
Overall Length: 220mm
All-up Weight:52g (Battery included)

Standard transmitter: TX6050
Receiver: RX6050
Main Brush Motor: 2826 Magnet
Tail Brush Motor: 0716

Standard transmitter: 1.9g 5 Rudder lead
Gyro: 3-Axis
Battery: 3.7V 300mAh Li-Po

Features:

1) The flybarless design characterizes low power loss and great improvements in efficiency.
2) Sophisticated 3-Axis gyro flybarless stabilization system automatically adjusts the controls for stable flight .
3) Highly developed low voltage drive system provides a green, environmentally friendly and safe power solution.
4) Mini size helicopter for indoors, providing 5-6 minutes of flight time after a full charge.

NO.6050

Flight operation,please carefully read the operating manual

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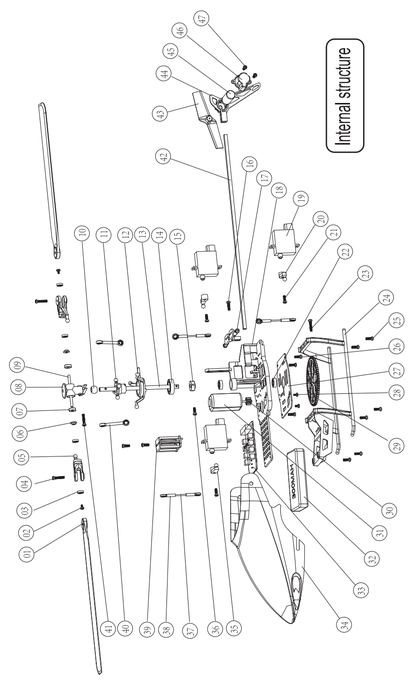
Appendix 4-
Internal structure

Item#	Description	Measurement	Quantity
01	Main airfoils		2
02	Phillips screws	PM1.2×2	2
03	Bearings	Ø1×Ø1.5×1.1	4
04	Phillips screws	PB1.4×7	2
05	Main airfoils holder		2
06	Main airfoils, Rudder connecting		2
07	Lower Main airfoils bearings ring		2
08	Swivel head		1
09	Main airfoil shaft		1
10	Sonh plate copper ball		1
11	Inside swash plate		1
12	Swash plate holder		1
13	Main shaft		1
14	Bearings	Ø10×Ø6×2.5	1
15	Main shaft locker		1
16	Phillips screws	PA1.2×4	1
17	Rudder connector		1
18	Principal holder		1
19	1.9g Rudder		3
20	Dedicated control arm		2
21	Phillips screws	PA1.2×3	3
22	Bearings	Ø6×Ø2.5×1.8	2
23	Phillips screws	PM1.2×5	1
24	Landing gear		1
25	Phillips screws	PB1.2×2.5	6
26	Phillips screws	PB1.2×4	5
27	Carbon fiber board		1
28	Phillips screws	PM1.4×4	2
29	Main drive gear		1
30	Rotor gear		1
31	Main rotor		1
32	300mah Battery		1
33	Receiver circuit board		1
34	Head cover		1
35	Front ladder control arm		1
36	Phillips screws	PM1.4×3	1
37	Pull rods		3
38	Pull rod connectors		6
39	Rudder connecting structure		1
40	Connecting buckles		2
41	Phillips screws	PM1.2×7	1
42	Tail carbon fiber tube	2×2×135	1
43	Tail airfoil		1
44	Tail rotor supporting connector		1
45	Tail rotor		1
46	Tail rotor protection		1
47	Phillips screws	PA1.4×3	2



Appendix 4-
Internal structure

01
Forewords

02
Safety matters needing attention

Dear customer:

Thank you for purchasing **a ChengXing** control aircraft product. In order to quickly and safely master the operation of the **6050** helicopter, please read the handbook carefully and then keep it in a safe place for future consultation and reference.

6050 helicopter with spread spectrum technology features impressive power,stable flighr,immediate response and strong anti-jamming characteristics.

2.1 Important Statement

(1) This product is not a toy. It is a piece of complicated equipment which harmoniously integrates engineering materials, mechanics, electronics, aerodynamic and high frequency radio. Correct installation and adjustment are necessary to avoid accidents taking place. The owner must always operate in a safe manner. Improper operation may result in serious property damage, bodily injury or even death.
(2) We accept no liability for damage and consequent damage arising from the use of these products, as we have no control over the way they are maintained, used and operated.
(3) This product is suitable for experienced RC Helicopter pilots aged 14 years or more.All minors must be accompanied by a responsible adult when flying.
(4) The flight field should be legally approved by the local government. We accept no liability for any safety duties or fines arising from operation, usage or mis-control after the sale of the products .
(5) We consign our distributors to offer technical support and service after sale. Please contact the local distributors for problem resolution caused by usage, operation, maintenance, etc.

2.2 Safety matters needing attention

RC helicopter flight is a high risk hobby, whose flight should be kept far away from other people. Mis-assembled or broken main frame, defective electronic equipment, and/or problematic radio system will lead to unforeseen accidents such as bodily injury or property damage. The pilot MUST pay attention to the flight safety and UNDERSTAND his responsibility for accidents caused by his carelessness.

(1) Far away from obstacles and people

An RC helicopter in flight has risk of uncertain flight speed and direction which is potentially dangerous. When flying, please keep your RC helicopter far away from people, high buildings, high-tension lines, etc, and avoid operating in rain, storms, thunder and lightening.

(2) Keep away from humidity

RC helicopter should be kept away from humidity and vapor because its complex, precise electronic components and mechanical parts may be damaged.

(3) Proper operation and maintenance

Please use **ChengXing** original spare parts to upgrade, modify or maintain you helicopter in order to ensure its safety. Please operate your helicopter within the range of functions permitted. It is forbidden to use it outside of the safety laws or regulations.

(4) Avoid flying alone

At the beginning of learning about radio-controlled flight there are some difficulties to overcome. Please avoid flying alone. Invite experienced pilots to guide you (two of the most effective methods to practice are via a PC flight simulator and/or under the supervision of a skilled pilot).

(5) Safe operation

Please fly your helicopter according to your physical status and flight skills. Fatigue, listlessness and mis-operation will increase the possibilities of accidental hazard.

(6) Keep away from high-speed rotating parts

Please keep the spinning blades of both main rotor and tail rotor away from the pilot, people and other objects.

(7) Protect from heat

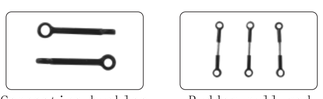
An RC helicopter is made from metal, fiber, plastic and electronic components, etc. Please keep away from heat and sunshine in order to avoid distortion, even damage, caused by high temperatures.

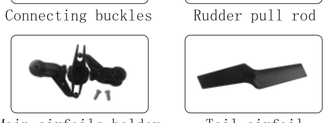
2.3 Attention before flight

(1) Ensure the battery packs of both transmitter and receiver are fully charged (saturated).
(2) Ensure both the throttle stick and the throttle trim of your transmitter stay at the lowest positions before operation.
(3) Please strictly obey the order of turn-on and turn-off before operation. When starting your flight, please connect the power cable of your helicopter first, and turn on your transmitter last.
When finishing your flight, please disconnect the power cable of your helicopter first, and turn off your transmitter last. An incorrect order of connection may cause your helicopter to loose control. Please cultivate the correct habit of turn-on and turn-off.
(4) Ensure the directions and actions in which servos execute transmitter commands are correct and smooth with respect to inputs. Never operate the helicopter with a broken servo as it will result in further damage to the product or people.
(5) Check there are no missing or loose screws and nuts, no incorrectly assembled or damaged parts. Carefully check the main blades have no defects, especially the position close to the main blade connector. Broken or mis-assembled parts will have a negative effect on the flight performance, and will cause unforeseen potential dangers.
(6) Check all the connections between ball linkages and balls. Loose linkages and balls should be replaced. Loose connections between linkages and balls will have a negative effect on the flight performance possibly resulting in a loss of control .
(7) Make sure the connections between the power cables of the battery pack and motors are solid. Continuous vibration and drastic 3D actions may loosen the batteries or cables in flight, possibly resulting in a loss of control.

02
Safety matters needing attention

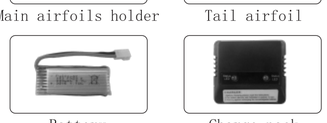
Appendix 3 -
Spare parts list


Connecting buckles


Rudder pull rod

Main airfoils holder

Tail airfoil

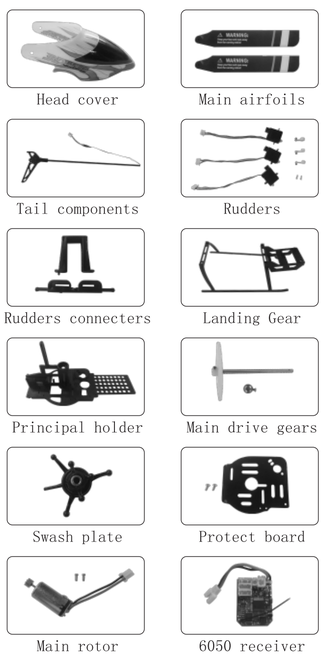

Battery

Charge pack

USB Charging wire

A/C adaptor

6050 remote controller

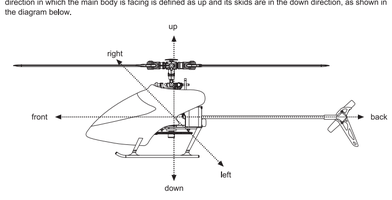

Head cover
Main airfoils
Tail components
Rudders
Rudders connecters
Landing Gear
Principal holder
Main drive gears
Swash plate
Protect board
Main rotor
6050 receiver

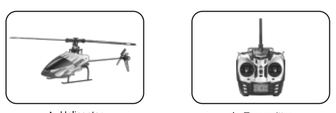
Appendix 3 -
Spare parts list

03
Definition of Helicopter Orientation

04
Standard equipment

In order to avoid confusion, the following sections will use the directions and orientations defined as follows.The helicopter is in front of the pilot with the tail boom and rotor closest to the pilot (tail in), the head or nose is facing forward (pointing away from the pilot).The left hand of the pilot is to the left side of the helicopter, the right hand of the pilot is to the right side of the helicopter.Its head/nose is to the front and it's tail boom is to the back. The direction in which the main body is facing is defined as up and its skids are in the down direction, as shown in the diagram below.

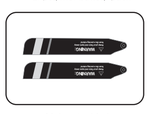



▲ Helicopter

▲ Transmitter

▲ Li-polymer battery pack

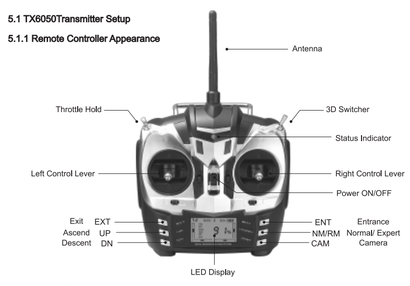
▲ Wall adapter /Power supply


▲ Main rotor blades

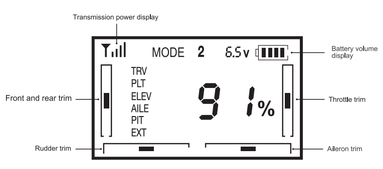
▲ User manual

5.1 TX6050Transmitter Setup

5.1.1 Remote Controller Appearance



5.1.2 Boost Screen

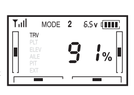


TRV：Neutral Throttle Curve Adjustment
PLT：PIT Limiting and Curve Adjustment
ELEV：Elevator
AILE：Aileron of the rudder
PIT：Pitch of the rudder
EXT：he minimum output of rudder

5.1.3 Neutral Throttle Curve Adjustment

Press button "ENT", TRV will be flashing, when press button "ENT" again to make percentage figure at the right of LED display and TRV flash. Now you could adjust the dual rate according your demand. When 3D Switcher at "0" position, you could adjust the neutral throttle of normal mode through Up/Down Turning switch. When 3D Switcher at "1" position, you could adjust the neutral throttle of upside down flight through Up/Down Turning switch.

Throttle value is lower--the slower speed of neutral point
Throttle value is higher-- the higher speed of neutral point



05
Transmitter setup

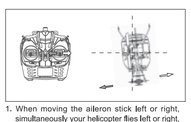
Appendix 2 –
Flight practice

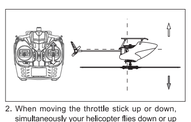
2.5 Aerobatic flight

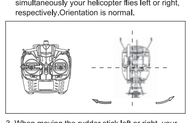
Your 6050 helicopter can perform breathtaking and exciting aerobatic flight such as dives and inverted 3D.

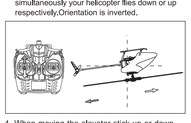
Inverted flight

Mode 1 (throttle stick at right hand)

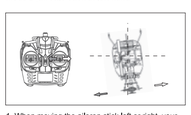

1. When moving the aileron stick left or right, simultaneously your helicopter flies left or right, respectively.Orientation is normal.

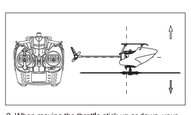

2. When moving the throttle stick up or down, simultaneously your helicopter flies down or up respectively.Orientation is inverted.

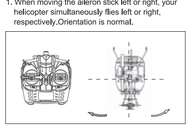

3. When moving the rudder stick left or right, your helicopter simultaneously flies right or left, respectively.Orientation is inverted.

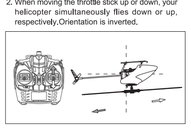

4. When moving the elevator stick up or down, your helicopter simultaneously flies backward or forward, respectively.Orientation is inverted.

Mode 2 (throttle stick at left hand)


1. When moving the aileron stick left or right, your helicopter simultaneously flies left or right, respectively.Orientation is normal.


2. When moving the throttle stick up or down, your helicopter simultaneously flies down or up, respectively.Orientation is inverted.

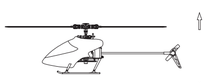

3. When moving the rudder stick left or right, the head of your helicopter simultaneously flies right or left, respectively.Orientation is inverted.


4. When moving elevator stick up or down, your helicopter simultaneously flies backward or forward, respectively.Orientation is inverted.

2 Advanced practice

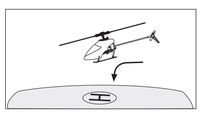
2.1 Frog-hopping practice

Repeat the take off and landing action using the throttle stick whilst maintaining a vertical path. Increase your rate of ascent and descent gradually as you become more comfortable with the exercise. Be sure to slow down in time when landing!



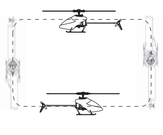
2.2 Practicing controlled take off and landing

Mark out an area on the ground as a landing pad to help practice deliberately taking off and landing from a set location. The process of take off and landing should be kept stable and as close to vertical as possible.



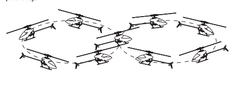
2.3 Practicing square flight

Take the takeoff point as the center to draw a square whose side length is about 2 meters. Fly your helicopter along the 4 sides and keep the flight height parallel to the line of sight. Make a 90 degree rotation at each corner of the quadrangle to adjust the flight direction. Train your straight flight skills and 90 degree flight course control. Fly in both directions around the circuit until familiar with the maneuver.



2.4 Figure eight practice

Once you have mastered the previous steps you can try flying smooth flat figure eights. Try to maintain the same altitude during the entire flight path. Take care when flying where there is wind as it may cause the helicopter to suddenly rise or fall unexpectedly.

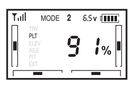


Appendix 2 –
Flight practice

05
Transmitter setup

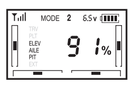
5.1.4 Pitch Curve Adjustment

Press button "ENT", TRV will be flashing, than press button "DN", LED display arise "PLT", when press button "ENT" again the percentage figure and PLT will be flashing. Firstly, turn the 3D Switcher to "1" position than you could adjust the total distance of pitch by button "UP/DN". At the same time, the above settings limit the pitch highest point of throttle, But when 3D Switcher at "0" position, you could adjust the pitch lowest point of throttle in normal mode.



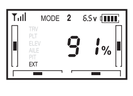
5.1.5 Reverse Function

Press button "ENT", than press button "DN" to enter ELEV selection, than press button "ENT" again to make "NOR/REV" flash. Now you could choose NOR or REV according to the function of rudder. Use the same settings, you could adjust the "AILE" and "PIT" to control the forward and reverse.



5.1.6 The minimum output of rudder

Press button "ENT", than press button "DN" to enter EXT selection, than press button "ENT" again to make percentage figure and ENT flash. Simultaneously, you could choose the most fitting output. The number is higher, the faster reaction of helicopter. Conversely, the slower reaction of helicopter.



5.2 Left/Right Hand Mode Switch Instruction

(1) Make sure the remote controller is OFF before you choose the Left/Right Hand Mode.
(Power-on enter the predetermined pattern)

(2) Knob rotates to the direction of "L" to choose Left Hand Throttle Mode, when it rotates to the direction of "R" to choose Right Hand Throttle Mode.

Left/Right Hand Mode Switch

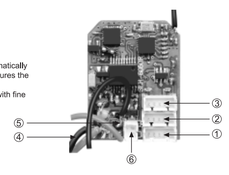
5.3 Control Lever Potentiometer calibration

(1) This remote controller has the function of potentiometer midpoint calibration.

(1) Calibration process : turn Throttle Hold Switch to position"1", leave the handle of accelerograph centered. Press button "ENT" for seconds, than turn on the controller, it will start automatic calibration.
After calibration turn Hold Switch to position"0".
Finally leave the handle of accelerograph in lowest position, complete the calibration.

6.1 TX6050T receiver features

(1) The use of a high performance receiver dramatically reduces the possibility of signal loss and ensures the accuracy and reliability of signal reception.
(2) 6-channel output makes multiple functions with fine control acailable.
(3) Elevator/Aileron Gyro sensitivity can be adjusted by the limiting output of rudder.



6.2 Function of receiver

S/N	Name for short	Full name	Function
①	ELEV	Elevator servo	Connects to the elevator servo and receives the control signal of elevator servo.
②	PIT	Pitch servo	Connects to the PIT servo and receives the control signal of PIT servo.
③	AILE	Aileron servo	Connects to the aileron servo and receives the control signal of aileron servo.
④	BATT.	Power cable	Connects to the battery(3.7V)
⑤	MAIN MOTOR	Main motor	Connects to the main motor
⑥	TAIL MOTOR	Tail motor	Connects to the tail motor

7.1 Installation of battery pack

Install the battery pack into the battery compartment in the direction of the arrow.

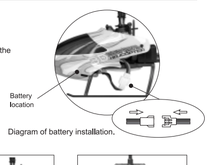
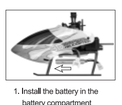
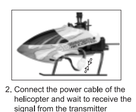


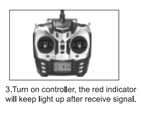
Diagram of battery installation.

7.2 Turn on the power

7.2.1 Turn on the power


1. Install the battery in the battery compartment


2. Connect the power cable of the helicopter and wait to receive the signal from the transmitter


3.Turn on controller, the red indicator will keep light up after receive signal.

7.2.2 Matters needing attention

(1) When Mode Switcher at 3D Mode position, helicopter will be fail to match signal with controller.
(2) Receiver should rest on the ground after the power supply is connected.
(3) When turn on controller, it will default to the current rocker mode .To avoid injury, please don't change the Left/Right Hand Mode to avoid when helicopter is fying.

06
Setup of the RX6050 receiver

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Steps of flight

Appendix 2 –
Flight practice

1 Flight practice for the beginner

1.1Matters needing attention

(1) Beginners should be supervised and guided by skilled pilots when learning.

(2) For the sake of safety, people should keep at least 5 meters away from the helicopter during practice.

(3) Choose a spacious open ground without people and obstacles as the flight practice field.

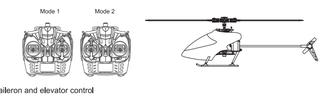
(4) This is a 3D helicopter. We kindly suggest that the knowledge of flying 2D/ coaxial helicopter is a pre-requisite before flying this model.

1.2 Steps

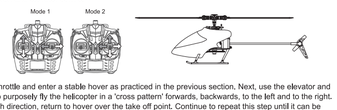
(1) Practicing throttle control - stationary flight

Start by standing directly behind the helicopter, tail closest to you and head/nose pointing away,Practice taking off from the ground and then by slowly pulling down on the throttle stick, land it softly and horizontally. Repeat this step until the throttle can be finely and carefully controlled.

When hovering, the tail rotor counteracts torque but also pushes helicopter to the left. Don't forget to counteract this effect using cyclic stick to the right and take off slightly inclined. It is important to hover vertically, stabilize helicopter at 1.5m height and then land it.

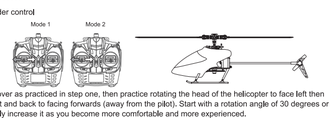


(2) Practice of aileron and elevator control



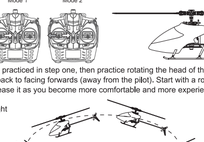
First increase throttle and enter a stable hover as practiced in the previous section. Next, use the elevator and aileron sticks to purposely fly the helicopter in a "cross pattern" forwards, backwards, to the left and to the right. In between each direction, return to hover over the take off point. Continue to repeat this step until it can be completed with ease.

(3) Practicing rudder control



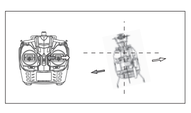
Enter a stable hover as practiced in step one, then practice rotating the head of the helicopter to face left then back to face right and back to facing forwards (away from the pilot). Start with a rotation angle of 30 degrees or less and gradually increase it as you become more comfortable and more experienced.

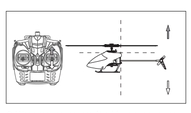
(4) Practicing circular flight

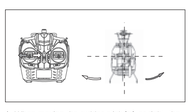


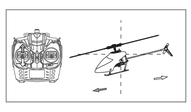
After mastering steps (1) to (3) with ease, please draw or mark a large circle on the ground. Fly your helicopter along this circular track until the flight is smooth and controlled.

Mode 1 (throttle stick at right hand)

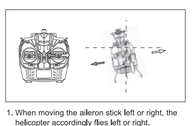

1. When moving the aileron stick left or right, the helicopter accordingly flies left or right.

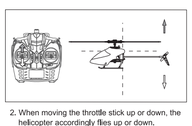

2. When moving the throttle stick up or down, the helicopter accordingly flies up or down.

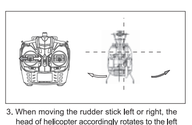

3. When moving the rudder stick left or right, the head of helicopter accordingly rotates to the left or right.

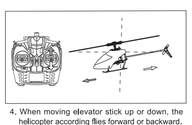

4. When moving the elevator stick up or down, the helicopter accordingly flies forward or backward.

Mode 2 (throttle stick at left hand)


1. When moving the aileron stick left or right, the helicopter accordingly flies left or right.


2. When moving the throttle stick up or down, the helicopter accordingly flies up or down.


3. When moving the rudder stick left or right, the head of helicopter accordingly rotates to the left or right.


4. When moving elevator stick up or down, the helicopter accordingly flies forward or backward.

Appendix 1-
Flight control

07
Steps of flight

7.2.3 Flight mode selector

(1) When turn on controller, it default to the Normal Mode (Learning Mode).
This mode is suitable for beginners to practice, not for 3D fly!

(2) Press button "NM/RM" one time, it enter 3D Mode with buzzing. Now you could try the 3D Fly!

7.3 Adjustment before flight

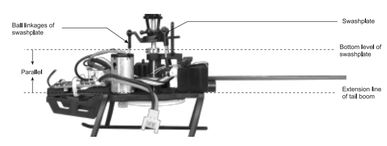
Warning: Disconnect the power cable of main motor before adjustment for the sake of pilot's safety.

Matters needing attention: Before departing the factory, all of the components have been correctly adjusted. Normally it is not necessary to make any adjustment. However, due to disturbance during long-distance transportation, some joints, screws or parts may be loose or even damaged. For safety's sake, please refer to section 2.3 - "attention before flight" and strictly follow the helicopter checks described.

7.3.1 Adjustment of swashplate

Inspection of swashplate

Place your helicopter on a spacious flat ground. Move the transmitter throttle stick and throttle trim to the lowest position. Move the elevator trim, aileron trim, and rudder trim to the neutral position. Turn on the transmitter first and then connect the power cable of the helicopter. After the LED on the receiver stops flashing and the beeps of the servos are heard, the transmitter and receiver are successfully connected. Next, check if the bottom plane of the swashplate is parallel to the longitudinal axis (front to back) of the helicopter - the extension line of the tail boom. Also check if the plane of the swashplate is parallel to the lateral axis (left to right) of the helicopter.



Adjustment of swashplate

If during the check above it is found that the swashplate is not level with either axis it can be adjusted using the following 2 steps:

(1) Adjust the servo bellcrank. First disconnect the helicopter power cable and turn off the transmitter. Unscrew the screw in the bellcrank of the servo and remove the bellcrank. Re-turn on the transmitter and re-connect the helicopter power cable in sequence. After code paring, replace the servo bellcrank so it is horizontal and check the swashplate is now level. If the swashplate is still angled or not at the center of travel, replace and re-tighten the bellcrank screw and move to step (2).
(2) Adjust the servo ball linkage. Adjust the length of the ball linkages of each servo until the swashplate is level and in the centre of the range of travel.

7.4 Adjustment of main rotor blades

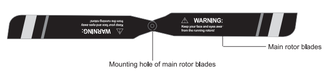
The aim of adjustment is to equalize the weight and centre of gravity of the main rotor blades and to ensure the blades are at the same level when rotating. Correct adjustment of the blades reduces vibration which improves performance and durability.

7.4.1 Color decal (tracking tape)

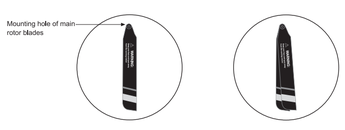
Two different colored blade tracking decals (red and silver) should be placed 6 mm away from the end of each blade tip. The purpose is to identify the position of each spinning blade in the following blade tracking inspection process.

7.4.2 Inspection and gravity center adjustment of main rotor blades

(1) Transverse inspection and adjustment of gravity center. Use a bolt to insert the mounting hole of main rotor blades and screw the bolt cap, and then stretch the main rotor blades in line. Hang the couple of main rotor blades in the air using the bolt as a fulcrum. If the main rotor blades keep in a horizontal line, it means ok; if one end of the main rotor blades is higher than the other one, please move the high end stick to the high direction, or move the low end stick to the high end until balanced.



(2) Longitudinal inspection of gravity center. Shown as below, take the mounting hole of main rotor blades as the fulcrum to vertically hang in the air. If the two main rotor blades are almost superposed, it means normal (shown as Fig. A); otherwise abnormal.



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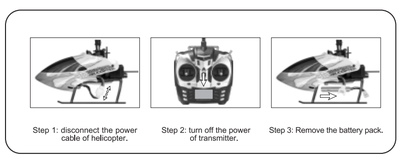
Step 1: disconnect the power cable of helicopter.
Step 2: turn off the power of transmitter.
Step 3: Remove the battery pack.

07
Steps of flight

08
Flight over

Changes or modifications not expressly approved by the party responsible for compliance could void the use'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 interferenceto 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 angenna. --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 accpet any interference received, including interference that may cause undesired operation.

please note that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Appendix

Appendix 1 ---------- Flight control
Appendix 2 ---------- Flight practice
Appendix 3 ---------- Spare parts list
Appendix 4 ---------- Internal structure