



GPS hold system



One Key Go Home



Failsafe to return home & Landing



Stable Mode with GPS and altitude Hold.



Low voltage protection



User Handbook

Specifications:

Main Rotor Diameter: 636mm

Tail Rotor Diameter: 136mm

Overall Length: 636mm

All-up Weight: 620g(Battery included)

Battery: 11.1V 1600mAh Li-Po

Transmitter: DEVO-7/10/8S/12S

Main controller: FCS400

Brush ESC: G400ESC

Main Motor: 380PF

Tail Motor: 1627F

Metal gear digital servo: WK-7602

Weight: 12g

Speed: 0.08sec / 60°(4.8V)

Torque: 1.5kgf.cm(4.8V)

Dimension: 22.5x11.8x24mm

Features:

- 1) Helicopter with GPS flight control system, makes flight more safe and easy to control.
- 2) 3 flight modes: Manual mode, GPS flight mode and One Key Go home Mode.
- 3) Helicopter with GPS function makes more easier for beginners and more fun flight for experts.
- 4) Equipped with metal gear digital servo, response quickly and powerful torque, very durable.

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01

Forewords



02

Safety matters
needing
attention**Dear customer:**

Thank you for purchasing a Walkera radio control aircraft product. In order to quickly and safely master the operation of the G400 RC helicopter, please read the user handbook carefully and then keep it in a safe place for future consultation and reference.

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 Walkera original spare parts to upgrade, modify or maintain your 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.



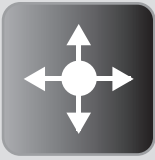
2.3 Attention before flight

- (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 turn on your transmitter first, and connect the power cable of your helicopter last. When finishing your flight, please disconnect the power cable of your helicopter first, and turn off your transmitter last. An upset in the order of connection may cause your helicopter to lose control. Please cultivate a correct habit of turn-on and turn-off.
- (4) Ensure the directions and actions which servos execute transmitter commands are correct and smooth, respectively. Using a broken servo will result in unforeseen dangers.
- (5) Check there are no missing or loose screws and nuts, no unassembled or damaged parts. Carefully check the main blades have no defects, especially the position close to the main blade connector. Broken or unassembled parts will have an effect on the flight performance, and will cause unforeseen potential dangers.
- (6) Check all the connections between ball linkage and ball. Loose linkages and balls should be changed. Loose connection between linkage and ball will have an effect on the flight performance, even lose control.
- (7) Assure there are solid connections between the power cables of battery pack and motors. Continuous vibrations in flight may loosen the battery tie-ins.



02

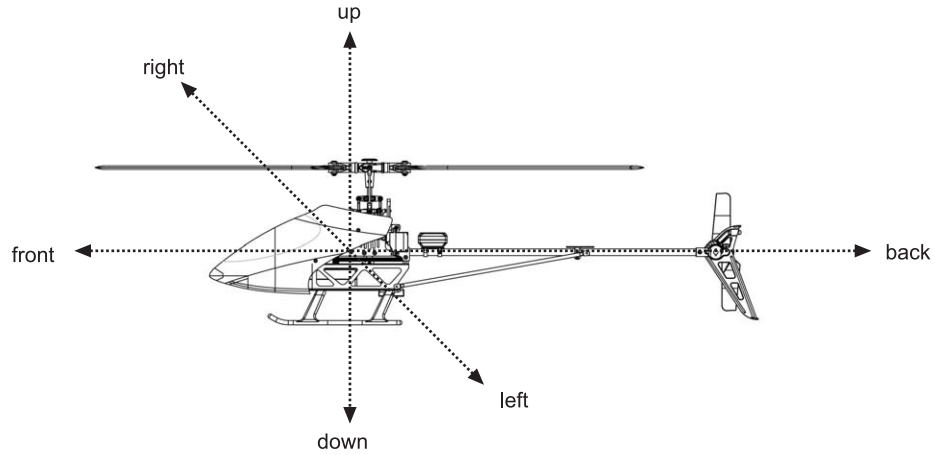
**Safety matters
needing
attention**



03

Definition of Helicopter Orientation

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 its 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.



04

Standard equipments



▲ Helicopter



▲ Transmitter



▲ Li-polymer battery pack



▲ Tool kit



▲ Wall adapter /Power supply



▲ GA005 balance charger

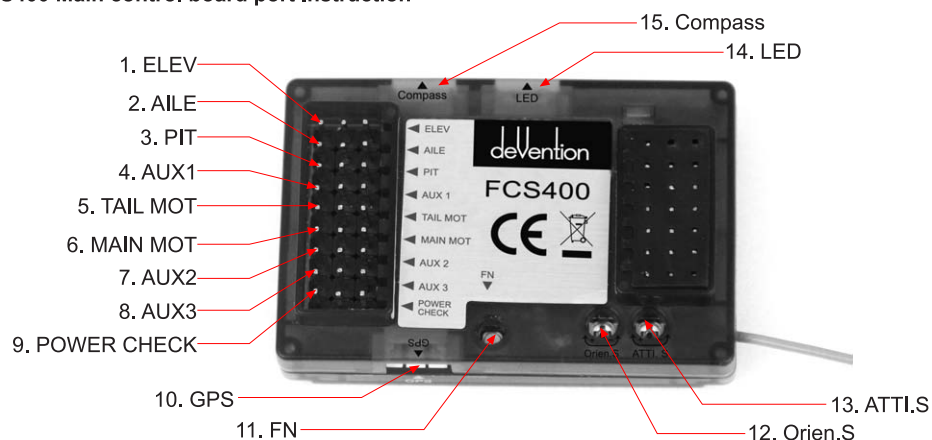


▲ User Handbook



▲ PIT Gauge

5.1 FCS400 Main control board port Instruction



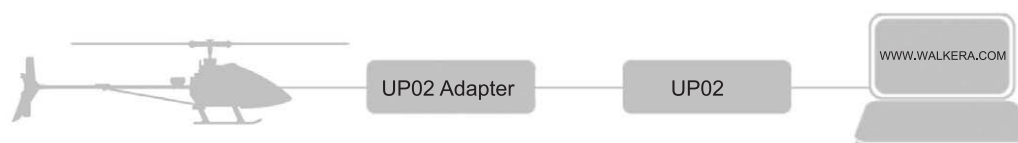
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FCS400 Main control board guideline

S/N	Name for short	Full name	Function
1	ELEV	Elevator	To control Elevator (forward & backward)
2	AILE	Aileron	To control Aileron(leftward & rightward)
3	PIT	Pitch	To control Pitch(Upward & downward)
4	AUX1	AUX1	Spare channel
5	TAIL MOT	Tail Motor	To link the tail motor signal wire
6	MAIN MOT	Main Motor	To link the the main motor signal wire
7	AUX2	AUX2	Spare channel
8	AUX3	AUX3	Spare channel
9	POWER CHECK	POWER CHECK	To check voltage
10	GPS	GPS	To link GPS module
11	FN	FN	Function key
12	Orient.S	Orientation sensitivity adjustment Button	Adjust the gyro sensitivity under GPS HOLD POSITION to change the flying performance. Clockwise direction(+) is to increase the gyro sensitivity; Anticlockwise direction (-) is to reduce the gyro sensitivity.
13	ATT.I.S	Attitude sensitivity adjustment Button	Adjust the gyro sensitivity during flying to change the flying performance. Clockwise direction(+) is to increase the gyro sensitivity; Anticlockwise direction (-) is to reduce the gyro sensitivity.
14	LED	LED	To link LED
15	Compass	Compass	To link Compass

5.2 FCS400 Main Control Board Upgrade

- (1) G400 control program upgrade can be downloaded online at Walkera Official Website:www.walkera.com.
- (2) G400 control program upgrade tool including UP02 cable and UP02 Adapter.

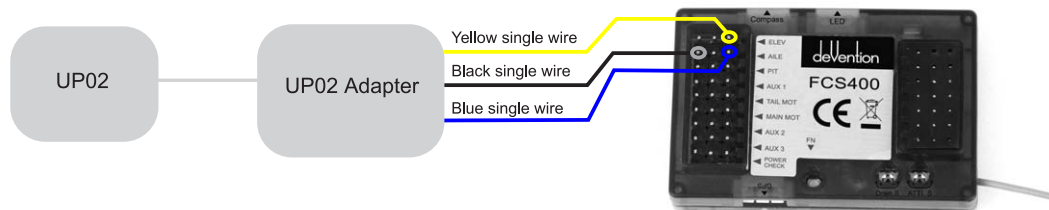




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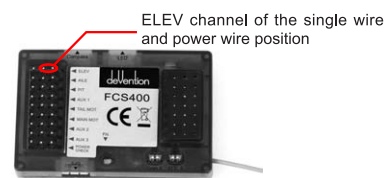
FCS400 Main control board guideline

(3) Connect yellow single wire plug to ELEV signal position, blue single wire plug connect to AILE signal position, black single wire plug connect to AILE position of earth wire.



5.3 Clear the FCS400 Main Control Board fixed ID

Insert the supplied BIND PLUG into the ELEV channel of the single wire and power wire position in the FCS400 Main Control Board, and then power on the Main Control Board. The red light of FCS400 Main Control Board will flash slowly. This means the fixed ID code has been cancelled. Remove the BIND PLUG.



5.4. Main Control System Control Mode

5.4.1 Control Mode Classification

There are three control modes according to the 3-position switch: Manual Mode, altitude Hold Mode and One Key Go Home.

5.4.2 Control Mode Switch Setting (Default setting for RTF version is MIX switch)

Please select a 3-position switch of the radio as control mode switch before flight.

Notes: please do not move any sticks when switch the control modes. The control mode can't be switched under inverted flight.

(1) Manual Mode	(2) Position Hold Mode	(3) One Key Go Home
MIX Switch to "0" Position	MIX Switch to "1" Position	MIX Switch to "2" Position

5.5 Code binding

Please follow the rule "turn on transmitter firstly and helicopter battery later". Turn on the radio and connect the helicopter power in 10 seconds. Red LED light blinks fast, after 1-3 seconds, it will be stable light. The code binding is successful when the red LED blinks slowly to Blue LED blinks slowly and mean while heard the servo reset voice.

5.6 Adjust Mode

Notes: During adjustment, please make sure that the power of main motor and tail motor are turned off to keep you safe.

5.6.1 Adjust mode Switch Settings (Default setting for RTF version is GEAR switch)

Please select a 2-position switch of the radio as adjust mode switch before flight.

(1) Working Mode	(2) Adjust Mode
GEAR Switch to "0" Position	GEAR Switch to "1" Position

5.6.2 Adjust Instructions

Turn the GEAR switch to "1" position, LED light is off, it means the helicopter is under Adjust Mode. The helicopter is available to adjust swashplate and blades through servo and ball-linkage. Turn the GEAR switch to "0" position for Working Mode when adjustment is finished.

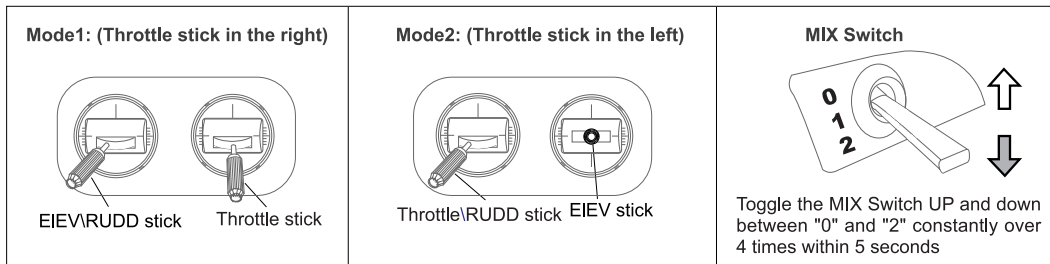
5.7 Compass Calibration

Notes: In order to protect yourself, please disconnect main/tail motor wires before compass calibration.

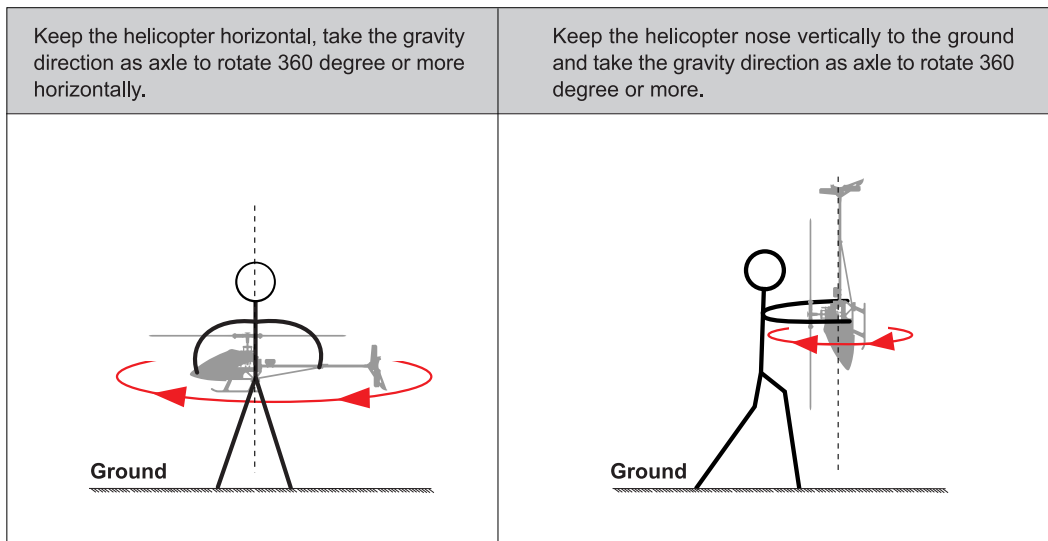
Please calibrate the compass when first flight, flying in circle and drift.

5.7.1 Compass Calibration

- (1) Put the helicopter on a horizontal place and move the rudder stick to the far left side, then toggle the MIX switch UP and DOWN between "0" and "2" constantly over 4 times within 5 seconds until red LED flashes fast, it means the helicopter under calibration mode now .



- (2) Slow uniform rotate the helicopter 360 degree or more at horizontal level until LED flashes blue quickly that means calibrate horizontal succeed. Then slow uniform rotate the helicopter vertically 360 degree or more until LED solid RED that means calibrate vertically succeed. Compass calibration finished.



- (3) Connect the helicopter battery again after the calibration.

5.7.2 Notes

- (1) Please keep away from magnetic materials area to calibration.
- (2) Please recalibrate the compass when the vehicle is circled and drifted during the flying.
- (3) Please recalibrate the compass if it is replaced or the vehicle position is changed.
- (4) Please check whether there is a strong magnetic field nearby disturbing the compass if the calibration is failed constantly.



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FCS400 Main control board guideline



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FCS400 Main control board guideline

5.8 GPS Signal illustration and detection(GPS module has to be connected)

Under Manual mode(MIX switch to "0" position), when the LED red lights on lastly indicates receipt signal, the LED blue lights flicker indicates signal failed reception. Under Position Hold mode(MIX switch to "1" position), when the LED blue lights on lastly indicates receipt signal. Under one key go home mode(MIX switch to "2" position), when the blue and red lights flicker alternatively indicates receipt signal.

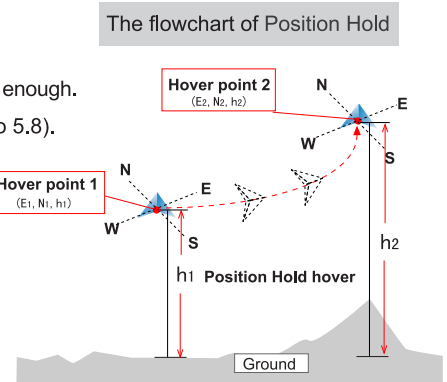
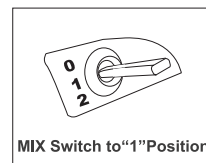
5.9 Altitude Hold function

5.9.1 Pre-conditions for altitude Hold

- (1) The helicopter is under normal flight status and battery voltage is enough.
- (2) GPS works fine and signal in good condition (detection refer to 5.8).

Operation Steps:

After hovering stably under manual mode, toggle the MIX switch to "1" position(Do not move any transmitter sticks), then it enters GPS Altitude Hold Mode.



5.9.2 Notes

- (1) Under Altitude Hold Mode, pilot can move the sticks to control flight.
- (2) Please begin the flight under manual mode and switch to Altitude Hold Mode after the helicopter hover stably, helicopter may drift up and down at this time, please push or pull the throttle a little bit properly.

5.10 One Key Go Home

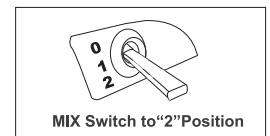
Starting position is the place where the main control board finishes initialization and auto check before taking off.

5.10.1 Pre-conditions for One Key Go-Home

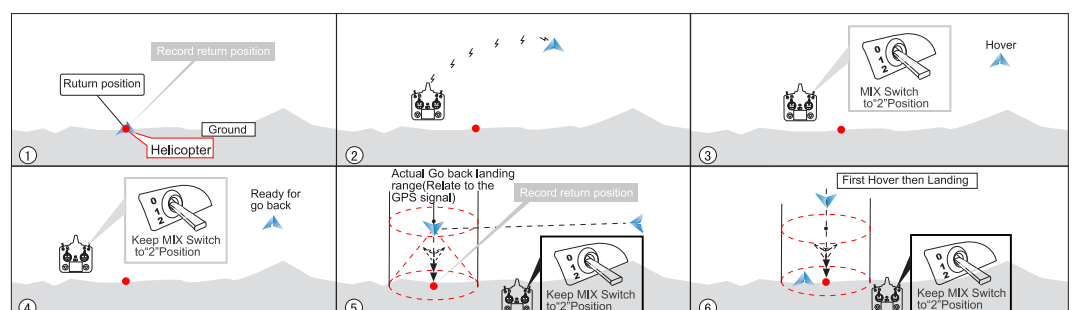
- (1) The helicopter is under normal flight status and battery voltage is enough.
- (2) The GPS works fine and signal in good condition(detection refer to 5.8).
- (3) Aero crafts equipped with a certain flying height(above 20m is recommended) and homeward distance (above 30m is recommended)

Operation Steps:

After hovering stably under manual mode, toggle the MIX switch to "2" position (Do not move any transmitter sticks), then it enters One Key Go Home Mode.



5.10.2 The flowchart of One Key Go Home



5.10.3 Notes

- (1) Please take off in manual mode, then switch to one key go home mode after the helicopter is hovering stably (avoid unstable and dangerous status). Under one key go home mode, you can control the flying status by moving the transmitter stick (especially when the helicopter is hovering up on the original recorded place, kindly please push down the throttle stick or even push it down to the lowest point until the helicopter is landed).
- (2) To make sure the safe usage, please record the start point before taking off, you should know the exactly the start point that the helicopter recorded.
- (3) If there are big obstacles around, the helicopter may be blocked on the return trip.
- (4) When GPS signal is in bad condition or GPS not work, the helicopter will not return.
- (5) Suggest to turn MIX switch to "1" to get into alititde hold mode, and turn MIX switch to "2" to get into One Key Go Home mode.

5.11 Failsafe to Return & Landing

Failsafe to return and landing is a protection when the helicopter is out of control because of no signal. Failsafe to return and landing mode will be activated automatically when the signal is lost; Under the failsafe to return and landing mode, when the signal is received again, you can control the flying status by moving the transmitter stick (especially when the helicopter is hovering up on the original recorded place, kindly please push down the throttle stick or even push it down to the lowest point until the helicopter is landed).

If you want to change the control mode, kindly please turn the MIX switch to "2" position (if it is already on position "2", just keep it), then change it again to normal flying.

5.12 Low Voltage Protection

Low Voltage Protection is a design to avoid the helicopter to crash by the low voltage of the battery. When the battery voltage is too low, the red LED will slow blink warning, the helicopter will descent slowly.

Note: When a low voltage alert occurs, please land the helicopter as soon as possible in order to avoid crash.



05

**FCS400 Main
control board
guideline**

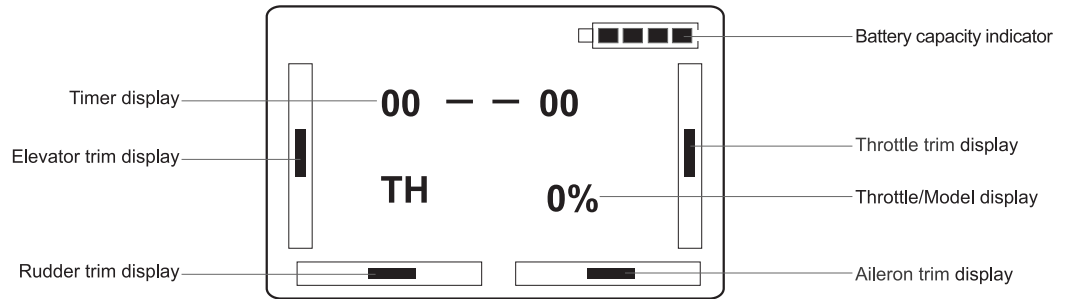


06

Transmitter setup

6.1 DEVO-7(optional radio) setting

6.1.1 Boot Screen



6.1.2 Model Type(TYPE)

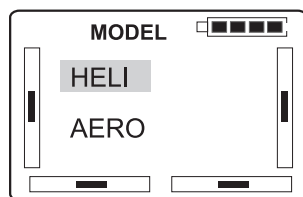
Press the ENT button to enter the Main Menu, press UP or DN until MODEL starts to flash, then press ENT button to enter the Model Menu. Press the UP or DN button until TYPE starts to flash. Press the ENT button to choose between Helicopter and Aeroplane types. Press the R or L button to select **HELI**, press ENT to confirm and EXT to go back to the previous menu.

6.1.3 Model Select(SELEC)

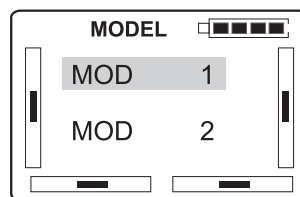
Press UP or DN key under the MODEL menu until SELEC starts to flash. Press ENT, the model options will be shown. Press UP or DN to choose MOD 1, press ENT to confirm and EXT back to previous menu.

6.1.4 Model Name(NAME)

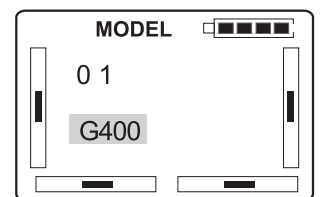
In the MODEL menu, press UP or DN until the NAME starts to flash. Press ENT to access the model serial No. and default name options. Press UP or DN to select the characters or numbers that you wish to change, use the R or L key to change the characters or numbers to "G400". Press ENT to confirm and EXT to go back to the previous menu.



6.1.2 Model Type(TYPE)



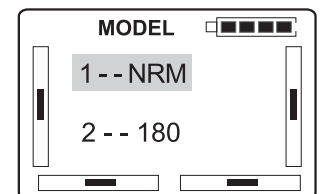
6.1.3 Model Select(SELEC)



6.1.4 Model Name(NAME)

6.1.5 Swash Type(SWASH)

Press the ENT button to enter the MODEL Menu and press UP or DN until SWASH starts to flash and then press ENT key. The Swashplate type will be shown. Press UP or DN to choose 1-NRM and after setting, press ENT to confirm and EXT to go back to the previous menu.



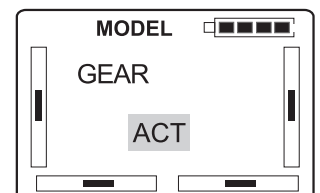
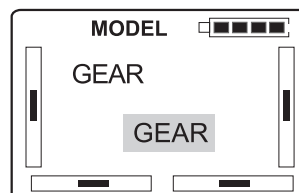
6.1.5 Swash Type(SWASH)

6.1.6 Device Output(OUTPU)

Press UP or DN under the MODEL menu, it comes out the flashing "OUTPU" menu. Press "ENT" to the submenu of "Output".

(1) GEAR Setting

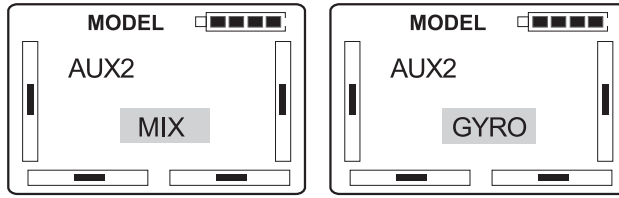
Press R or L to choose "GEAR GEAR"; Press DN and R or L to choose "GEAR ACT".



GPS

(3) AUX2 Setting

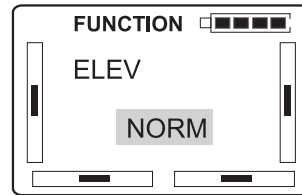
Press DN and R or L to choose "AUX2 MIX"; Press UP and R or L to choose "AUX2 GYRO", and press ENT to confirm. Press EXT to exit to the main interface.



6.1.7 Reverse Switch(REVSW)

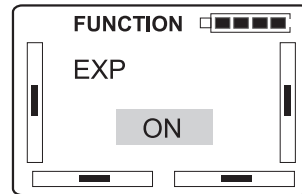
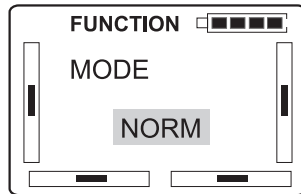
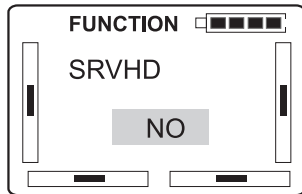
Press ENT to enter the Main Menu, press UP or DN until FUNCTION starts to flash, then press ENT to access the function menu. Press UP or DN until REVSU starts to flash. Press ENT to display the channel name and the reverse status. Press R or L to change between NOR and REV settings. Press DN to display each channel AILE, THRO, RUDD, GEAR, PITCH, GYRO and their corresponding reverse setting. Set each channel as shown in the table below. Once complete, press ENT to confirm and EXT to go back to the previous menu.

ELEV	AILE	THRO	RUDD	GEAR	PITCH	GYRO
NORM	NORM	NORM	NORM	NORM	NORM	NORM

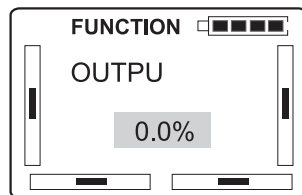
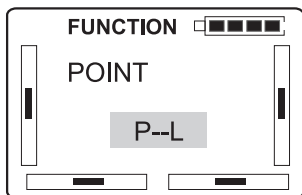


6.1.8 Throttle Curve

In the FUNCTION menu press UP or DN until THCRV is flashing, Press ENT to display the servo lock screen, press R or L to display NO then press ENT to confirm. The flight mode options are displayed, there are three flight modes, NORM, ST 1 and ST 2. Press R or L to select the flight mode you want to setup. Press DN to display the EXP option, press R or L to select ON.



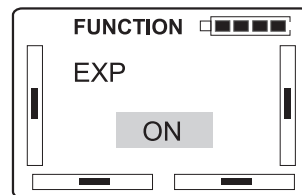
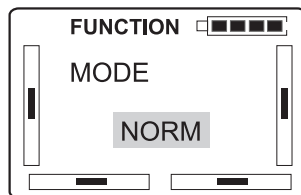
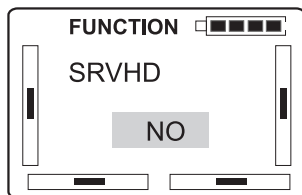
Press DN to display the Point option. Press R or L to select the L, M, H point. Press DN to display the point output setting. Press R or L to increase or decrease the point setting value. Press ENT to confirm and press UP to go back to the other point settings. After inputting all the settings, press ENT to confirm and press EXT to go back to the previous menu.



	point output		
Flight mode	L	M	H
NORM	0.0%	50.0%	100.0%
ST 1	100.0%	60.0%	100.0%
ST 2	100.0%	60.0%	100.0%

6.1.9 PIT Curve(PTCRV)

In the FUNCTION menu, press UP or DN until PITCRV is flashing, press ENT to display the servo lock screen, press R or L to display NO, then press ENT to confirm. The flight mode options are displayed, there are three flight modes, NORM, ST 1 and ST 2. Press R or L to select the flight mode you want to setup. Press DN to display the EXP option, press R or L to select ON.



06

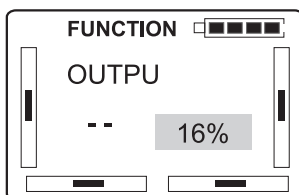
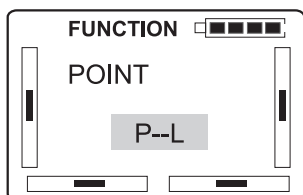
Transmitter setup



06

Transmitter setup

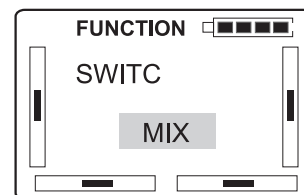
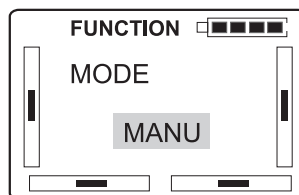
Press DN to display the Point option. Press R or L to select the L, M, H point. Press DN to display the point output setting. Press R or L to increase or decrease the point setting value. Press ENT to confirm and press UP to go back to the other point settings. After inputting all the settings, press ENT to confirm and press EXT to go back to the previous menu.



Flight mode	point output		
	L	M	H
NORM	-16%	+23%	+55%
ST 1	-55%	+0%	+55%
ST 2	-55%	+0%	+55%

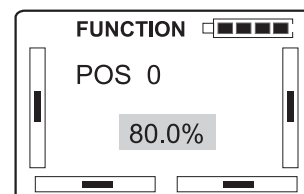
6.1.10 Gyro Sensor(GYRO)

Press UP or DN until GYRO item flash under Function interface. Press ENT to display the gyro mode setting screen. Press R or L to select MANU for manual setting. Press DN to display the control switch options, press R or L to select MIX.



Press DN to display the switch position value. The first position is POS 0, press R or L to change the gyro value setting. Press DN to display POS 1 and POS 2. Set the values as per the table below. After finishing the settings, press ENT to confirm and EXT to go back to the main menu.

Switch Position	POS0	POS1	POS2
Gyro Value	80.0%	50.0%	0.0%



6.2 DEVO-8S/10/12S(optional radio) settings

6.2.1 Type:Helicopter

6.2.2 Swash type:1 Servo Normal

6.2.3 Device Output

DEVO-8S			DEVO-10			DEVO-12S		
Gear	GEAR SW	Active	Gear	GEAR SW	Active	Gear	GEAR SW	Active
Pitch	System	Active	AUX2	MIX SW	Gyro	Pitch	System	Active
AUX2	MIX SW	Gyro	AUX3	RUDD D/R	Active	AUX2	MIX SW	Gyro
AUX3	RUDD D/R	Active	AUX4	AUX4 KB	Active	AUX3	AUX3 Lever	Active
			AUX5	AUX5 KB	Active	AUX4	AUX4 Lever	Active
						AUX5	AUX5 Lever	Active
						AUX6	AUX6 Knob	Active
						AUX7	AUX7 Knob	Active

6.2.4 Reverse switch settings

DEVO-8S		DEVO-10		DEVO-12S	
Elevator	Normal	Elevator	Normal	Elevator	Normal
Aileron	Normal	Aileron	Normal	Aileron	Normal
Throttle	Normal	Throttle	Normal	Throttle	Normal
Rudder	Normal	Rudder	Normal	Rudder	Normal
Gear	Normal	Gear	Normal	Gear	Normal
Pitch	Normal	Pitch	Normal	Pitch	Normal
Gyro	Normal	Gyro	Normal	Gyro	Normal
AUX3	Normal	AUX3	Normal	AUX3	Normal
		AUX4	Normal	AUX4	Normal
		AUX5	Normal	AUX5	Normal
				AUX6	Normal
				AUX7	Normal



06

Transmitter setup

6.2.5 Throttle curve

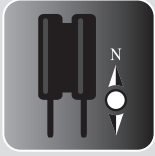
Flight mode \ point output	L	M	H
Normal Flight	0.0%	50.0%	100.0%
Stunt 1	100.0%	60.0%	100.0%
Stunt 2	100.0%	60.0%	100.0%

6.2.6 Pitch curve

Flight mode \ point output	L	M	H
Normal Flight	-16%	+23%	+55%
Stunt 1	-55%	0%	+55%
Stunt 2	-55%	0%	+55%

6.2.7 Gyro sensor

Mode	Manual
Switch	MIX SW
Pos 0	80.0%
Pos 1	50.0%
Pos 2	0.0%



07

Instruction and attention of ESC

7.1 Function of brush ESC

Electronic Speed Controller (ESC), mainly used in EP helicopter as a drive output device, is an electronic control circuit for the revolution speed and CW- and CCW-rotation of the motor. It will magnify the proportional signal it receives into voltage and current that can be directly exploited by the motor, the advantages of which, compared with the traditional mechanical speed controller, include compact dimension, long longevity, high efficiency and high output power.

7.2 Connection method of brush ESC



S/N	Full name	Function
1	Main motor connecting wire	connect with main motor
2	Tail motor connecting wire	Connect with tail motor
3	Power connecting wire	Connect with Lipo battery
4	Main motor signal wire	Connect with MAIN MOT channel on the FCS400 main control board.
5	Tail motor signal wire	Connect with TAIL MOT channel on the FCS400 main control board.
6	low voltage protection signal wire	Connect with POWER CHECK channel on the FCS400 main control board.

7.3 Matters needing attention

All the signal wires should be correctly connected. Otherwise, the ESC may fail to operate correctly.

8.1 Specification and function of servo

8.1.1 Specification of servo

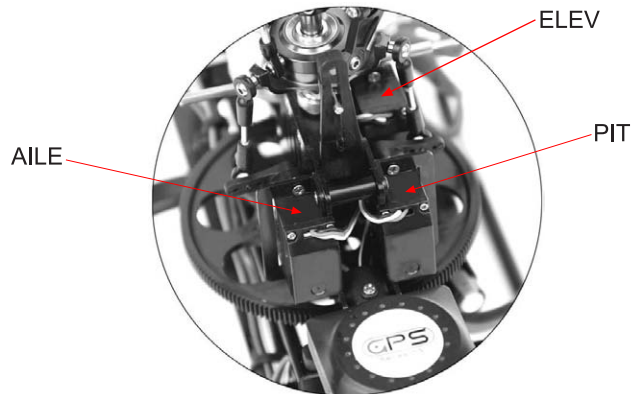
	Weight	Voltage	Torque	Speed	Dimension
WK-7602	12g	4.8~6V	1.5Kgf.cm	0.08sec/60°	22.5×11.8×24mm

8.1.2 Basic function of servo

A servo is an electro-mechanical device that converts a signal from the receiver into mechanical movement to control its direction and speed.

8.2 Connection and adjustment of servos

8.2.1 Connection of servos



S/N	FCS400 Main control board port	Connection method	Wire direction
1	ELEV	Connects to elevator servo signal wire	White wire facing front
2	AILE	Connects to aileron servo signal wire	White wire facing front
3	PIT	Connects to pitch servo signal wire	White wire facing front

8.2.2 Adjustment of servos

Before departure from the factory, all the servos have been correctly adjusted and locked in the correct position. In general no adjustment is needed.

8.2.3 Matters needing attention

- (1) All the plugs should be correctly connected. An incorrect connection will cause the servos not work or to operate in a direction which is different from the one required.
- (2) Please ensure that the servo travel are all within the permitted maximum range after maintenance, replacement or adjustment of servo linkages. Failure to do this could cause a servo to jam at maximum travel causing loss of control, damage and possibly injury.



08

Servo setup and adjustment



09

Instruction and attention of GA005 balance charger

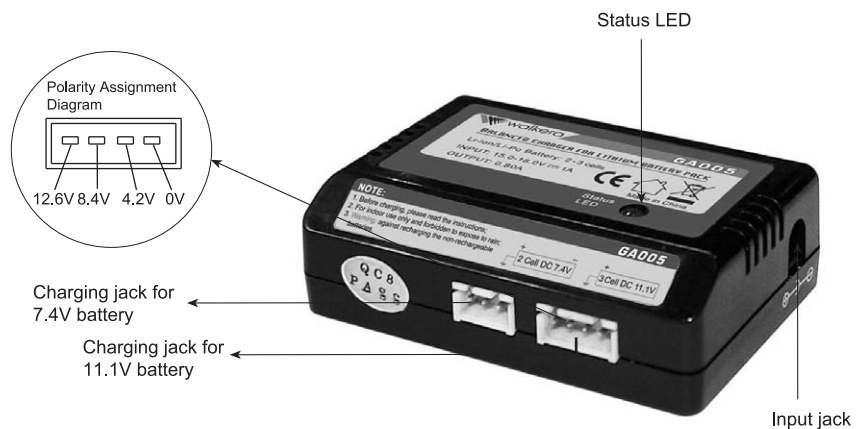
9.1 Parameters of GA005 balance charger:

Input voltage	Input current	Output current	Dimension	Weight
DC15-18V	1000mA	≤800mA	62.5×47×20.8mm	46g

9.2 Features of GA005 balance charger

- (1) GA005 utilizes microcomputer chips to monitor and control over the whole charging process in a balanced way with LED indicating light to display the charging status at real time.
- (2) Connects to an input power supply (DC 15-18V 1000 mA).
- (3) GA005 is suitable for 2-3S (7.4V/ 11.1V) Li-ion or Li-polymer battery pack.
- (4) Automatically detects 2-3S Lithium battery. GA005 will automatically charge when it finds the voltage of anyone cell among the LiPo pack is excessively low. At the same time LED displays as charging status (flash in red). The voltage of anyone cell LiPo is controlled at the level of $4.2 \pm 0.05V$ to ensure the maximum voltage difference of single cell in the battery is less than 50 mV.

9.3 Instruction of GA005 balance charger



9.4 Operation steps



Plug the wall adapter into the mains power supply. Its output end connects to GA005. Then its LED is lighting in solid red.



Insert the balanced pin of LiPo battery into GA005.



During charging, Red LED is continuously flashing. If saturated, Red LED becomes solid green lighting.

9.5 Charging statuses corresponding to LED

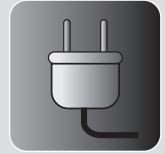
steps	Operation	LED Status	Charging status
1	Insert the wall adapter into the mains power supply, and then its output is connecting to GA005.	LED is in red solid lighting	Power on
2	Step 1 + connect the battery to GA005	LED is flashing in red	Charging
		LED becomes from red to solid green.	Saturated

9.6 Matters needing attention

- (1) During charging, GA005 should be put in dry and ventilated place and be far away from heat sources and inflammable and explosive substances.
- (2) GA005 is only used to charging a 2S or 3S Li-ion or Li-polymer battery. It is forbidden to simultaneously charge two or more sets of batteries packs. Either the charger or battery may be damaged.
- (3) When charging, the battery should be removed from your helicopter. Never leave the charger unsupervised during the process of charging in order to avoid risk of accidents.
- (4) Never immediately charge your battery as soon as the flight is finished, or when its temperature doesn't cool down. Otherwise the battery will take a risk in swelling, even catch a fire.
- (5) Ensure the correctness of polarity before connecting the battery to charger.
- (6) Avoid drop and violence during the process of charging. Drop and violence will result in internal short circuit of the battery.
- (7) For the sake of safety, please use original charging equipment (wall adapter + GA005 balance charger) and battery pack. Please change new one in time when the old battery is becoming swollen due to long time usage.
- (8) If it is retained in the charger for a long time after saturated, the battery may automatically discharge. When the charger detects that the voltage of individual cells is lower than the rated voltage, it will re-charge until saturated. Frequently charging and discharging will shorten the lifetime of your battery.

9.7 Maintenance of battery pack

- (1) The battery should be put in dry and ventilated place. The storage temperature of the environment is ranged from 18°C to 25°C.
- (2) Please avoid frequent charging and excessive discharging the battery in order to prolong its life cycle.
- (3) It is a must to maintain the battery before long-term storage. That is to charge the battery to the level of 50-60% saturation.
- (4) If the storage term is over 1 month, it is advised to monthly check the voltage of every cell of the battery . The voltage of every cell should be not less than 3V. Otherwise, please refer to the above article (3).
- (5) From the view point of protection, new battery should be motivated before usage. That is to charge and discharge 3-5 times, but discharge is not less than the level of 70% saturation. This process will make the battery lifetime longer and voltage more stable.



09

Instruction and attention of GA005 balance charger



10

Steps of flight

10.1 Turn on the power

10.1.1 Turn on the power

<p>Step 1</p>	<p>Step 2</p>	<p>Step 3</p>	<p>Step 4</p>
<p>Step 1: Take off the canopy, and install the battery in the battery compartment.</p>	<p>Step 2: Turn on the power of transmitter.</p>		
<p>Step 3: Pull down the throttle stick and throttle trim of transmitter to the lowest position, and then move the elevator trim, aileron trim, and rudder trim at the neutral positions, respectively.</p>		<p>Step 4: Connect the power cable of the helicopter and wait to receive the signal from the transmitter. The helicopter should be placed on flat ground or surface during code pairing (binding). Do not move the transmitter sticks or the helicopter until binding has completed.</p>	

10.1.2 Matters needing attention

- (1) Please follow the rule "turn on transmitter firstly and helicopter battery later". Turn on the radio and connect the helicopter power in 10 seconds. Red LED light blinks fast, after 1-3 seconds, it will be stable light. The code binding is successful when the red LED blinks slowly to Blue LED blinks slowly and mean while heard the servo reset voice.
- (2) If failed to connect the power cable of helicopter in 10 seconds after transmitter is turned on, please turn off the transmitter and repeat the step (1).

10.1.3 Trouble shooting a flashing FCS400 main control board LED after connecting the power cable

Possible causes	Solutions
Code pairing failed.	Turn transmitter off then on and re-connect helicopter power cable.
The throttle trim and throttle stick of transmitter are not at the lowest position.	Pull down the throttle trim and throttle stick to the lowest position and re-code pair.
The transmitter battery is low or empty.	Replace transmitter battery and re-code pair (re-bind).
The helicopter battery is low or empty.	Replace the helicopter battery with a fresh pack and re-code pair.
No function in FCS400 main control board or transmitter.	Replace faulty FCS400 main control board or transmitter and re-code pair.

10.2 Adjustment before flight

In order to protect yourself, please make sure that you will turn off the main/tail motor power before flying calibration. Turn the GEAR switch to "1" position first, then begin calibration. Please turn the GEAR switch to "0" position as normal working condition.

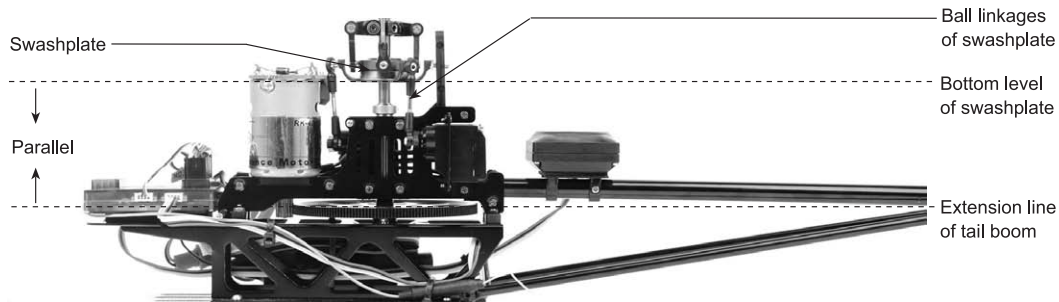
Matters needing attention: Before departing the factory, all of the components have been correctly adjusted. Normally it is not necessary to make any adjustment. However, due to disturbance during long-distance transportation, some joints, screws or parts may be loose or even damaged. For safety's sake,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

10.2.1 Adjustment of swashplate

Inspection of swashplate

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

Please check whether the swashplate is parallel to the horizontal axis of the main body or not (tail extension line) under adjust mode.



Adjustment of swashplate

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

Servo bellcranks must be horizontal at mid throttle. Swashplate must be at center of travel at mid throttle

If the bottom of swashplate is not in horizontal level, it can be adjusted via the following two steps:

- (1) Servo arm adjust, loosen the servo arm screw, take the servo arm away and mount back but keep the servo arm horizontal, then tighten the screw.
- (2) Adjust the ball linkage of servo. Make the swashplate parallel to the horizontal level via adjusting the length of servo ball linkage.

10.3 Adjustment of main rotor blades

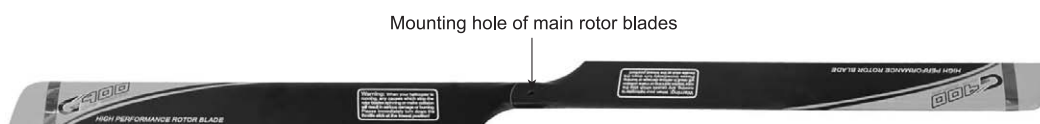
The purpose of adjustment is to make the weight and gravity center of main rotor blades equally distributing and ensure the main rotor blades are in same level during high speed spinning.

10.3.1 Color decal (tracking tape)

Two different colored blade tracking decal should be placed 20mm away from each end of blade tip, whose purpose is to identify the position of each spinning blade in the following inspection of the blade tracking.

10.3.2 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, and/ or move the low end stick to the high end until balanced.



10

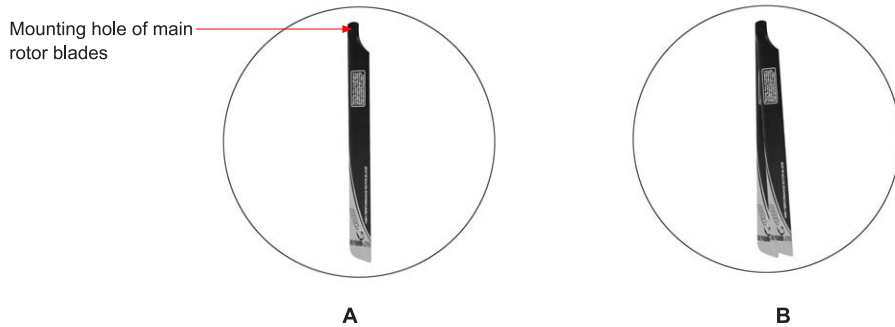
Steps of flight



10

Steps of flight

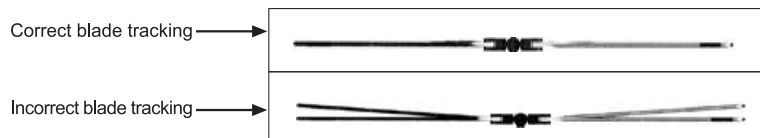
- (2) Longitudinal inspection of gravity center. Shown as below, take the mounting hole of main rotor blades as the fulcrum to vertically hang in the air. If the main rotor blades are almost superposed, it means normal (shown as Fig. A); otherwise abnormal.



10.3.3 Tracking inspection

Note: for the sake of safety, please keep the main rotor blades of helicopter at least 3 meters away from the pilot when he is inspecting the tracking problem.

Slowly push up the throttle stick of the transmitter and ensure both the line of sight of the pilot and the main rotor blades are in the same horizontal level. when the main rotor blades are spinning, please observe whether or not the levels are superposed in the same level. superposition is correct, otherwise there exists tracking problem and adjustment is required

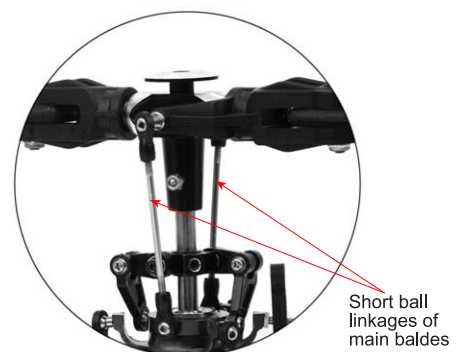


10.3.4 Adjustment of blade tracking

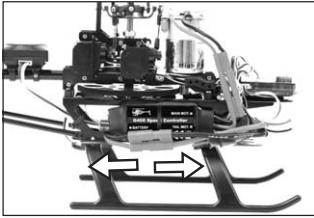
Below are the main course for incorrect blade tracking:

- (1) The weights of blades are unequal.
- (2) The gravity center distribution of blades is unequal.
- (3) The lengths of ball linkages of two blades are set improperly.
- (4) When blades are too loose, blades shake due to gap, or main blade connectors distort.

When there exists tracking blades, please shorten the length of the ball linkage located in the higher blade, or prolong the length of the ball linkage located in the lower blade



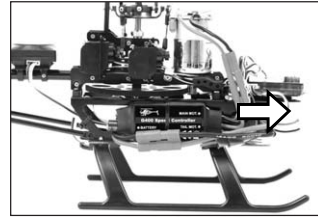
If the main blades are normal at low speed but abnormal at high speed, or normal at high speed but abnormal at low speed, please check whether or not the main blade connectors are loose or distorted. If the main blade connectors are loose, please tighten their screws; if the main blade connectors distort, please change new one. The bad blade tracking can be removed just by repeatedly exact adjustments.



Step 1: disconnect the power cable of helicopter.



Step 2: turn off the transmitter.



Step 3: take off the battery.



11

Flight over

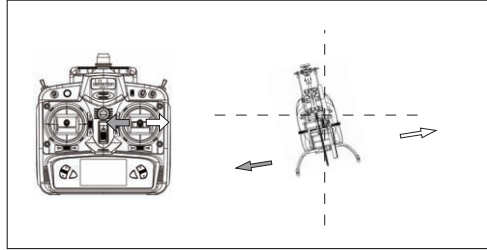


12

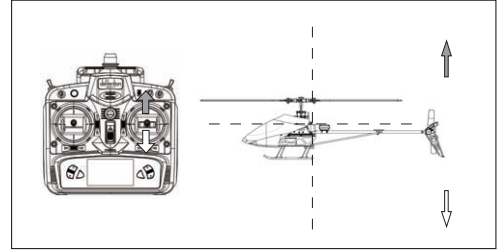
Manual flight control

12.1 Manual normal flight control

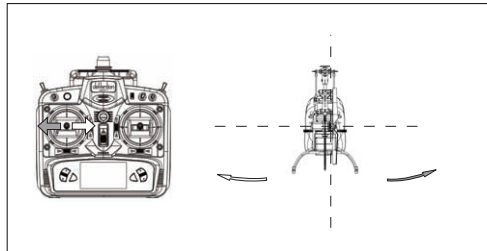
Mode 1 (throttle stick at right hand)



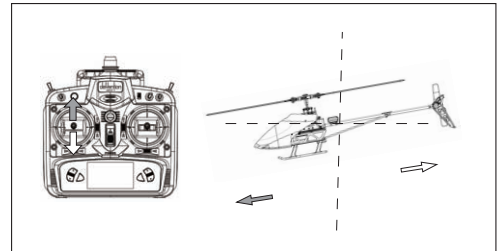
1. When moving the aileron stick left or right, the helicopter accordingly flies left or right.



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

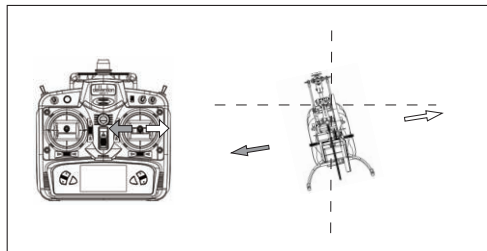


3. When moving the rudder stick left or right, the head of helicopter accordingly rotates to the left or right.

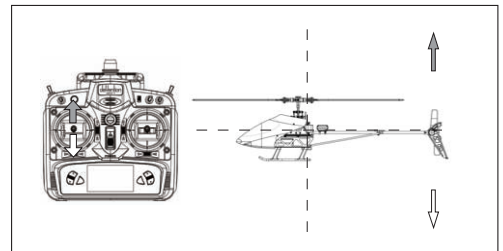


4. When moving the elevator stick up or down, the helicopter accordingly flies forward or backward.

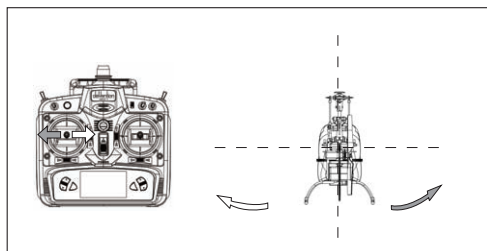
Mode 2 (throttle stick at left hand)



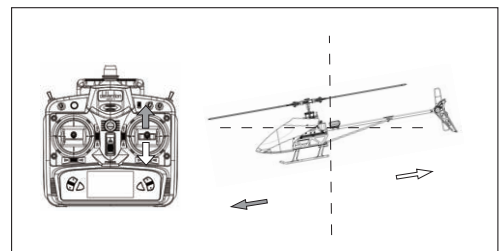
1. When moving the aileron stick left or right, the helicopter accordingly flies left or right.



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.

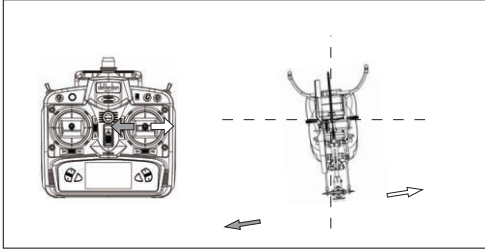


4. When moving elevator stick up or down, the helicopter accordingly flies forward or backward.

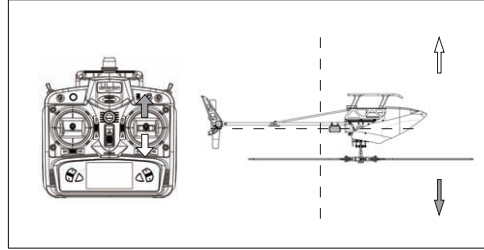
GPS

12.2 Manual stunt flight control

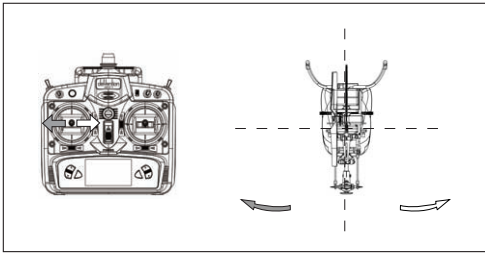
Mode 1 (throttle stick at right hand)



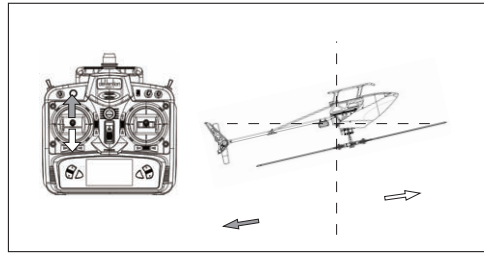
1. When moving the aileron stick left or right, simultaneously your helicopter flies left or right, respectively. Orientation is normal.



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

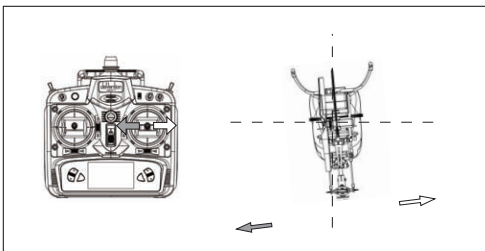


3. When moving the rudder stick left or right, your helicopter simultaneously flies right or left, respectively. Orientation is inverted.

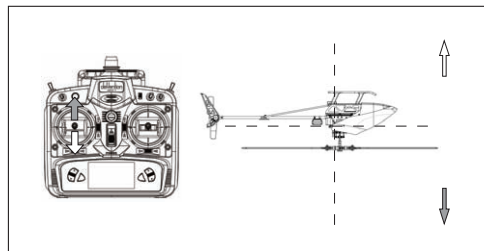


4. When moving the elevator stick up or down, your helicopter simultaneously flies backward or forward, respectively. Orientation is inverted.

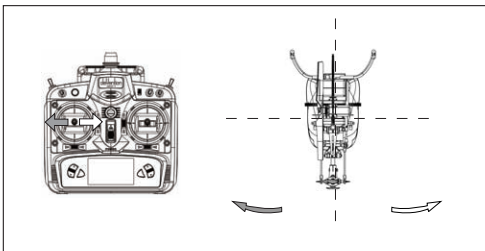
Mode 2 (throttle stick at left hand)



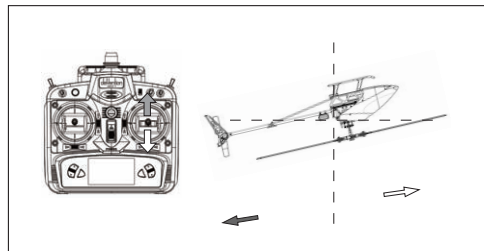
1. When moving the aileron stick left or right, your helicopter simultaneously flies left or right, respectively. Orientation is normal.



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.

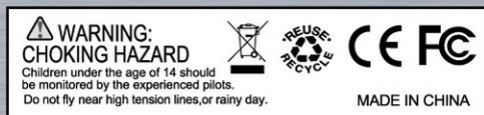


4. When moving elevator stick up or down, your helicopter simultaneously flies backward or forward, respectively. Orientation is inverted.



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Manual flight control



The specifications of the R/C aircraft may
be altered without notice.



Add.: Taishi Industrial Park, Dongchong Town
Panyu District, 511475 Guangzhou

Tel.: (8620) 8491 5115 8491 5116

Fax.: (8620) 8491 5117

Web: www.walkera.com

Email: heli@walkera.com
info@walkera.com