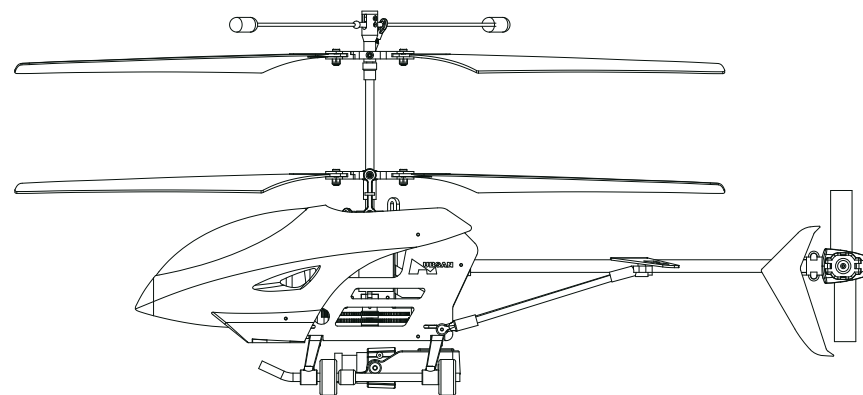


FPV HELICOPTER INSTRUCTION MANUAL



No.H202F

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>INTRODUCTION
>SAFETY NOTES
>SAFETY CHECK BEFORE FLYING
>TRANSMITTER SETUP
>INSTRUCTION FOR BATTERY RECHARGING
>FLYING TRAINING

1 INTRODUCTION

Thank you for buying HUBSAN products. The helicopter is designed as an easy to use, full featured RC helicopter model capable of all forms of rotary flight. Please read the manual carefully before assembling the model, and follow all precautions and recommendations within the manual. Be sure to retain the manual for future reference, routine maintenance, and tuning.

1.1 IMPORTANT NOTES

This RC helicopter is not a toy, it utilizes various high-tech products and technologies to provide superior performance.

Please read this manual carefully before operating this product. Improper use of this product can result in serious injury. Be aware of your personal safety, safety of others and your surrounding environment.

We recommend that you obtain the assistance of an experienced pilot before attempting to fly our product for the first time.

2 SAFETY NOTES

2.1 CAUTION

R/C helicopters have parts that move at high speed, thus posing a certain degree of danger. Pilots are responsible for any actions resulting in damage or injury from the improper operation of their R/C aircraft models.

Choose a wide open space without obstacles. Do not operate R/C aircraft near buildings, crowds of people, high voltage cables, or trees to ensure the safety of yourself, others and your model.

Operate this unit within your ability. Do not fly whilst tired, improper operation may cause in danger.

2.2 LiPo Battery Recharging

Your helicopter is powered by a Lithium-Polymer (LiPo) battery.

Never recharge your battery whilst it is inserted in your model. It can catch fire leading to the total destruction of the item.

Remember, your helicopter is designed for indoor operation, where low-speed precision-control is paramount. When flying in the great outdoors - even though you may think it's absolute flat calm - you will notice that your helicopter is susceptible to almost imperceptible air currents. This presents an interesting challenge for the experienced pilot, but could spell disaster if attempted too soon. So, take your time and practice the Flying Lessons described in this manual until you have acquired proficiency in the Advanced Maneuvers.

Make sure it really is a flat calm day outside. And remember that outdoor flight is a whole new learning experience.

Flying your radio-controlled helicopter outdoors really is great fun. Just remember its design limitations and be prepared to make the professional pilot's decision to cancel your plans and you helicopter will live to fly another day.

***There are Old pilots, and there are Bold pilots.....
But, there are no Old Bold pilots!***

5. Don't forget to be ready to catch the helicopter's loss of lift. As you servos are creating a battery power drain, you will need to increase the collective Throttle while maintaining the Rudder input Exiting the Turn maneuver

6. At the end of the turn, begin to SUMULTANEOUSLY ease off the cyclic Roll, collective Rudder and the additional Throttle inputs. You should practice until you can simultaneously use all of the joystick inputs in smooth, synchronized movements. This will take a lot of practice!

Throttle

+

Elevator

+

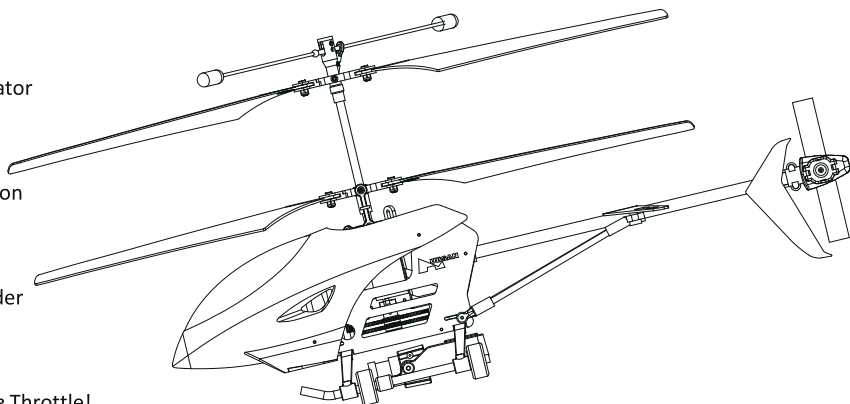
Aileron

+

Rudder

+

more Throttle!



These inputs will result in your model adopting a nose-down right-roll attitude. Note that the top rotor remains almost horizontal (as a result of the gyroscopic stabilizer arm), while the servos have pushed the swash plate to tilt the lower rotor right-and-forwards in the intended direction of travel.

Tip- if you become confused, releasing your helicopter's controls will bring it to a stop. It will not lose height, as the Throttle is on a ratchet.

The effect of simultaneous control inputs will, with practice, result in elegant slip-free turns which demonstrate the sophisticated controls of your 4 channel RC helicopter.

6.7 Flying Outdoors

The final challenge is to fly your helicopter outdoors under open skies!



SAFETY ADVISORY NOTICE

[Lithium-Polymer (LiPo) Batteries]



LiPo batteries differ from conventional batteries in that their chemical contents are encased in a relatively insubstantial foil packaging. This has the advantage of significantly reducing their weight, but does make them more susceptible to damage if roughly or inappropriately handled. As with all batteries, there is a risk of fire or explosion if safety practices are ignored:

- Charge and store LiPo batteries in a location where a battery fire or explosion (including smoke hazard) will not endanger life or property**
- Keep LiPo batteries away from children and animals
- Consider how you would deal with a LiPo battery fire/explosion as part of your normal home Fire Safety & Evacuation Planning
- Never charge a LiPo pack that has ballooned or swelled due to over-/under-charging or from a crash
- Never charge a LiPo battery pack that has been punctured or damaged in a crash (After a crash, inspect the battery pack for the sign of damage. Discard in accordance with your country's recycling laws.)
- Do not charge LiPo batteries near flammable materials or liquids
- Ensure that charging leads are connected correctly. Reverse polarity charging can lead to battery damage or a fire or explosion
- Never charge a LiPo battery in a moving vehicle
- Only charge your LiPo battery using the supplied "balanced" charger
- Have a suitable(electrical type) fire extinguisher near the charging area OR a large bucket of dry sand. Do not try to extinguish electrical (LiPo) battery fires with water
- Reduce risks from fire/explosion by storing and charging LiPo batteries inside a suitable container: a LiPo Sack or metal/ceramic container is advised
- Monitor recharging LiPo batteries for signs of overheating
- Never over charge a LiPo battery
- Never leave a LiPo battery unattended during recharging
- Protect your LiPo battery from accidental damage during storage and transportation. (Do not put battery packs in pockets or bags where they can short circuit or can come into contact with sharp or metallic objects.)
- If your LiPo battery is subjected to a shock (such as a helicopter crash) you should place it in a metal container and observe for signs of swelling or heating for at least 30 minutes
- Do not attempt to disassemble or modify or repair a LiPo battery

2.3 PREVENT MOISTURE

R/C models are composed of many precision electrical components. It is critical to keep the model and associated equipment away from condensation and other contaminants. Exposure to water or moisture may cause the model to malfunction resulting in loss of responsiveness, or a crash.

2.4 PROPER OPERATION

For the safety purpose, please only use hubsan's spare parts for replacement.

2.5 ALWAYS BE AWARE OF THE ROTATING BLADES

When in operation, the main and tail rotor blades will be spinning at high speed. The blades are capable of inflicting serious body injury and damage to the environment. Be cautious of your actions and careful to keep your body and loose clothing away from the blades. Never take your eyes off the model or leave it unattended while it is turned on. Once landed, immediately turn off the model and transmitter.

2.6 AVOID FLYING ALONE

Beginners should avoid flying alone whilst learning flight skills. It is advised that an experienced pilot be on hand for guidance.

It is recommended to practice with a computer-based flight simulator.

3 SAFETY CHECK BEFORE FLYING

CAREFULLY INSPECT BEFORE REAL FLIGHT

- Before operation, please check the batteries of the transmitter and receiver are charged enough for the flight.
- Before turning on the transmitter, please check that the throttle stick is in the minimum position.
- Check for any missing or loose screws and nuts. Carefully check main rotor blades and rotor holders. Broken or premature failure of parts will result in a dangerous situation.
- Check all the ball links to avoid excess play and replace as needed. Failure to do so will result in poor flight stability.
- Check the battery and power plug are securely fastened. Vibration and violent flight may cause the plug to loosen resulting in loss of control.
- When turning on the unit, please follow the power on/off procedure: for Power ON-please turn on the transmitter first, and then turn on the receiver. For Power OFF-please turn off the receiver first and then turn off the transmitter. Improper procedure may cause loss of control of the helicopter.

4. Notice that the cyclic joystick is spring-loaded, you must maintain a forwards pressure on the cyclic joystick otherwise it will return to its neutral position and your helicopter will stop moving.

Tip-if you become confused, releasing your helicopter's controls will bring it to stop. it will not lose height as the throttle is on a ratchet.

5. Stop you helicopter, turn it around (use rudder), and bring it back.

6. Choose a landing site. Fly your helicopter to a position that is precisely over your chosen landing site and set your helicopter down in a smooth and precise landing.

7. Repeat this flying lesson until you become S-M-O-O-T-H-L-Y proficient and precise.

3.5 Advanced Maneuvering

In this flying lesson you will combine cyclic joystick Pitch and Roll inputs with collective Rudder and Throttle inputs to give more precise control to your helicopter maneuvers.

You've probably already tried combining Rudder and forward Pitch inputs. This combination allows you to turn your helicopter, but it won't look right. The helicopter will remain upright. It's like watching a bicycle that's not leaning into the turn, because air has very little grip, your helicopter will actually skid through its turn.

The solution is to make the helicopter lean-"Roll"-so that rotors help to counteract the tendency to skid (or 'side slip').To do this, you must learn to synchronise your use of mixed Pitch and Roll on the cyclic joystick, with mixed Rudder and Throttle on the collective joystick

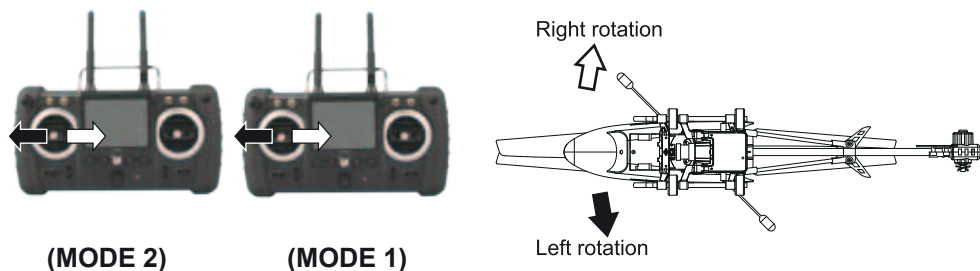
1. Begin a hover at shoulder height.
2. Push the cyclic stick Forwards to gather sufficient airspeed.
3. Begin your turn by pushing the cyclic joystick to the right (setting up the Roll) while maintaining forward pressure.
4. As your model begins to respond to the Roll, push the collective Rudder joystick to the right to initiate the turn.

6.4 Basic Maneuvering

In this Flying Lesson you will use the cyclic joystick and the Rudder to maneuver your helicopter.

1. Keeping a safe 1 to 2 meters from your model, S-M-O-O-T-H-L-Y advance the collective Throttle joystick until your helicopter reaches approximately shoulder height.

2. S-L-O-W-L-Y apply collective Rudder control to point the nose of your helicopter in the direction you wish to fly.



Rudder (Collective Torque Yaw) rotates your helicopter's fuselage Left/Right

3. Once you have turned your helicopter, place your right thumb over the tip of the cyclic joystick and S-L-O-W-L-Y press forwards.



Elevator (Cyclic Pitch) moves your helicopter Forwards/Backwards

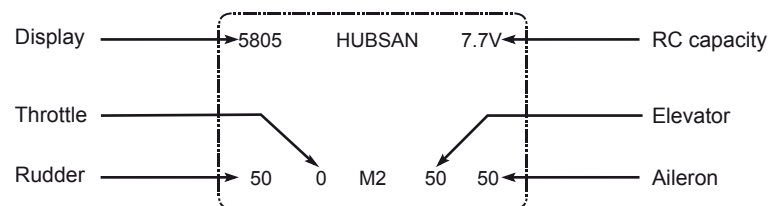
The lower rotor will tilt forward. The helicopter's nose will pitch down. Your helicopter will begin to move forward.

Tip- Be ready to slightly increase your Throttle power, as the helicopter is likely to lose a little height during maneuvering. Also remember that the swash plate on the helicopter links all of your cyclic controls; so don't be surprised if your helicopter moves slightly to the left/right as well as forwards. As you gain experience, you will stop thinking in terms of Left/Right or Forwards/Backwards and start to automatically synchronize cyclic joystick corrections, just like flying a full size helicopter.

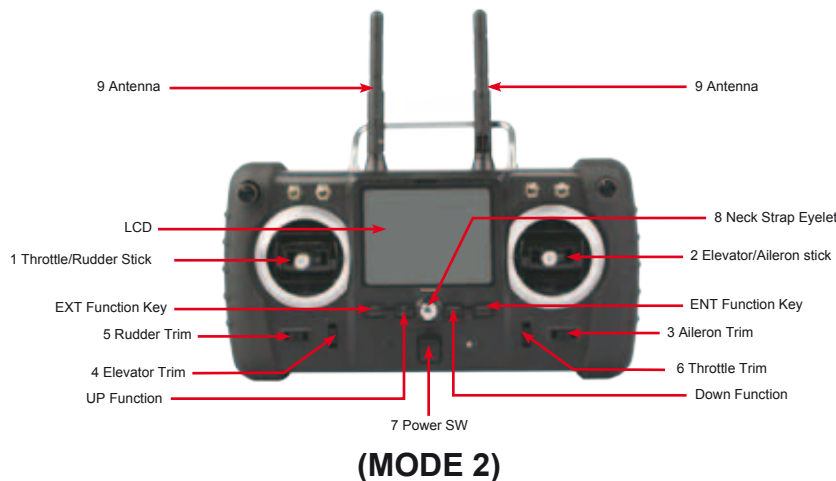
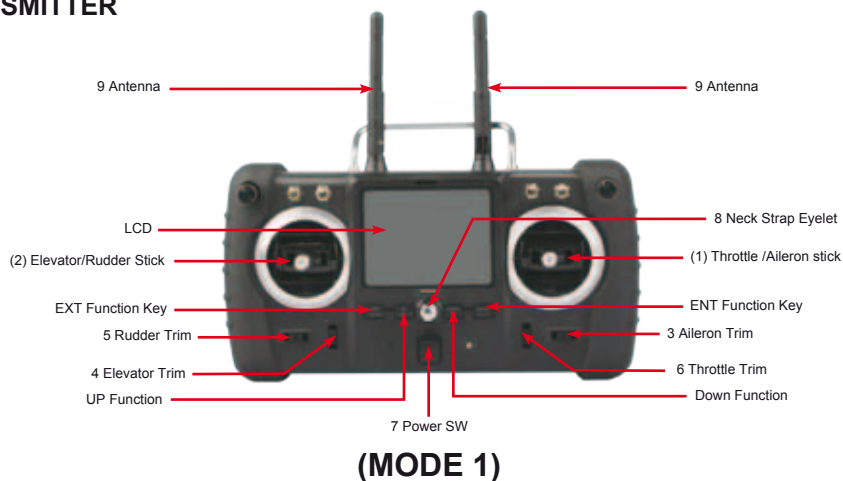
4 TRANSMITTER

4.1 Identification and functional keys

Main Menu



TRANSMITTER



Input Key Function

S/N	Identification	Function
1	Throttle/Rudder Stick	Forward and backward movement of the stick makes the helicopter ascend and descend respectively. Left and right movement of the stick will rotate the helicopter's fuselage left/right respectively.
2	Elevator/Aileron Stick	Forward and backward movement of the stick makes the helicopter move forward and backward respectively. Left and right movement of the stick makes the helicopter drift sideways left/right respectively.
(1)	Throttle /Aileron stick	Forward and backward movement of the stick makes the helicopter ascend and descend respectively. Left and right movement of the stick makes the helicopter drift sideways left/right respectively
(2)	Elevator/Rudder Stick	Forward and backward movement of the stick makes the helicopter move forward and backward respectively. Left and right movement of the stick will rotate the helicopter's fuselage left/right respectively.
3	Aileron Trim	Aileron trim subsidiary adjusts left and right drift.
4	Elevator Trim	Elevator trim subsidiary adjusts forward and backward movement.
5	Rudder Trim	Rudder trim subsidiary adjusts left and right rotation.
6	Throttle Trim	Throttle trim subsidiary adjusts ascent and descent.
7	Power SW	Pushing up switches on the power transmitter, pulling down switches it off.
8	Neck Strap Eyelet	For the attachment of a neck strap which eases the tension of your hands from holding the transmitter.
9	Antenna	Transmits wireless signal
10	CHG (Optional)	Can be used to charge the rechargeable battery pack (excluded) inside the transmitter (at charge current 50mA, Voltage ≤ 12V.) Notice: It is dangerous to charge a non-rechargeable battery pack via this charge port. It is dangerous to use the accompanied wall adapter as a DC power supply.
11	DSC (Optional)	Connects to the data cable of computer simulator.

6.3 Hovering and Cyclic Trim

Because your helicopter's rotors create a 'downdraft' any attempt to hover at too low an altitude (height) is more difficult than hovering a little higher. This difficulty is because the downdraft from your rotors is bounced back off the ground, resulting in turbulent air around the helicopter-this is referred to as 'Ground Effect'. For this reason, we recommend that you begin your hovering practices at about 1 meter off the ground.



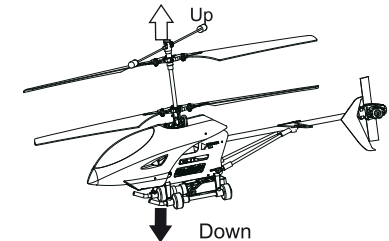
1. Keeping a safe 1 to 2 meters from your model, S-M-O-O-T-H-L-Y advance the collective Throttle joystick until your helicopter reaches approximately waist height.



(MODE 2)



(MODE 1)



Throttle (Collective Power) Increases/decreases the Flying Height of your helicopter

2.If the helicopter has a tendency to rapidly move in any direction, either:

- a.LAND IMMEDIATELY, by S-M-O-O-T-H-L-Y reducing the throttle power. Then adjust the trim sliders to compensate. Repeat the sequence from Step1, above.
- b.GENTLY apply cyclic joystick correction in the opposite direction to the helicopter's aberrant movement. Once you've established the amount of required control correction, land your helicopter. Adjust the trim sliders equivalent to the amount of the applied joystick compensation. Repeat this sequence, beginning at Step1, above.

3.GENTLY and S-L-O-W-L-Y push forward/pull back on the collective Throttle to maintain an even height without 'bouncing' the helicopter up and down.

Tip: for more sensitive control-and improved ability to mix Throttle and Rudder inputs-try placing your left thumb on the tip of the collective joystick.

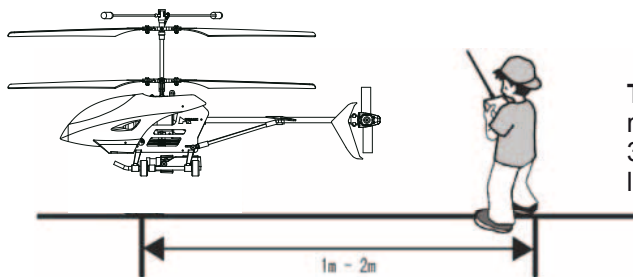
4.S-L-O-W-L-Y reduce the Throttle power and GENTLY land your helicopter.

5.Repeat the exercise, from Step 1 until you can confidently lift, hover and land your helicopter under full control.

Although the helicopter's trim has been factory set, you will need to fine tune the settings so that your helicopter can maintain a better balanced hover

IMPORTANT: KEEP YOUR CONTROL INPUTS VERY S-L-O-W & GENTLE

1. Set the collective Throttle joystick and trim slider to its lowest setting. All other trim sliders should be at their mid positions.
2. After completing the 'Power-On (Failsafe) Procedure', place your model on a smooth, flat surface which will allow it to slide and turn (a landing board is idea).



Tip: The helicopter will find the rudder central automatically in 3 seconds after the helicopter landing on the ground

3. Keeping a safe 1 to 2 metres away from your model, always ready to switch off the Throttle, S-L-O-W-L-Y advance the collective Throttle joystick until you can see that the model's landing skids are just trying to lift but are not yet hovering.
4. Observe how your helicopter behaves.
5. Most likely, your model will begin to Yaw (rotate) or Roll (topple to one side). It may even show signs of an inclination to Pitch (Rock forwards or backwards) onto its nose or tail.
6. Adjust the appropriate trim slider(s) to counteract any observed movement(s).
7. Once the trim sliders have balanced your helicopter, it is time to test the Rudder response. Move the collective joystick S-L-O-W-L-Y to the Left/Right and verify that your model is responding as shown in the 'Effects of Controls' illustration.
8. You will probably find you need to re-adjust the slider trim to get an equal response from Left/Right Rudder inputs.

If your helicopter's control response do not correspond to the behaviour described in 'Effects of Controls', check that your Servo Reverse switches are set correctly.

Note: we have not yet used the cyclic joystick controls (other than their trim sliders), as these will tilt the helicopter, which may cause the lower rotors to touch the ground. This would result in wear or damage.

4.2 Reversing channel setup

4.2.1.ELEV REVERSE SET UP

Hold down ENT key for 1 second to enter setting status, Press ENT key to enter reverse setting status, Press ENT key to choose reverse, and then hold EXT key for 2 seconds to confirm and exit.

5805	HUBSAN	7.7V
Set reverse	-	
→ Elevator	Normal	
Aileron	Reverse	
Throttle	Normal	
Rudder	Normal	
Set sensitive	X	
Plane type	Helicopter	
Expert mode	No	
Stick mode	Mode 2	

4.2.2. AILE REVERSE SET UP

Hold down ENT key for 1 second to enter setting status. Press ENT key to enter reverse setting status. Move arrow to Aileron by up/down key, Press ENT key to choose reverse and then hold EXT key for 2 seconds to confirm and exit.

5805	HUBSAN	7.7V
Set reverse	-	
Elevator	Normal	
→ Aileron	Reverse	
Throttle	Normal	
Rudder	Normal	
Set sensitive	X	
Plane type	Helicopter	
Expert mode	No	
Stick mode	Mode 2	

4.2.3. THRO REVERSE SET UP

Hold down ENT key for 1 second to enter setting status. Press ENT key to enter reverse setting status. Move arrow to Throttle by up/down key, Press ENT key to choose reverse and then hold EXT key for 2 seconds to confirm and exit.

5805	HUBSAN	7.7V
Set reverse	-	
Elevator	Normal	
Aileron	Reverse	
→ Throttle	Normal	
Rudder	Normal	
Set sensitive	X	
Plane type	Helicopter	
Expert mode	No	
Stick mode	Mode 2	

4.2.4. RUDDER REVERSE SET UP

Hold down ENT key for 1 second to enter setting status. Press ENT key to enter reverse setting status. Move arrow to Rudder by up/down key, Press ENT key to choose reverse and then hold EXT key for 2 seconds to confirm and exit.

5805	HUBSAN	7.7V
Set reverse	-	
Elevator	Normal	
Aileron	Reverse	
Throttle	Normal	
→ Rudder	Normal	
Set sensitive	X	
Plane type	Helicopter	
Expert mode	No	
Stick mode	Mode 2	

4.2.5. EXPERT MODE REVERSE SET UP

Hold down ENT key for 1 second to enter setting status. Press ENT key to enter reverse setting status. Move arrow to Exper mode by up/down key, Press ENT key to choose reverse and then hold EXT key for 2 seconds to confirm and exit.

5805	HUBSAN	7.7V
Set reverse	X	
Set sensitive	X	
Plane type	Helicopter	
→ Expert mode	Yes	
Stick mode	Mode 2	

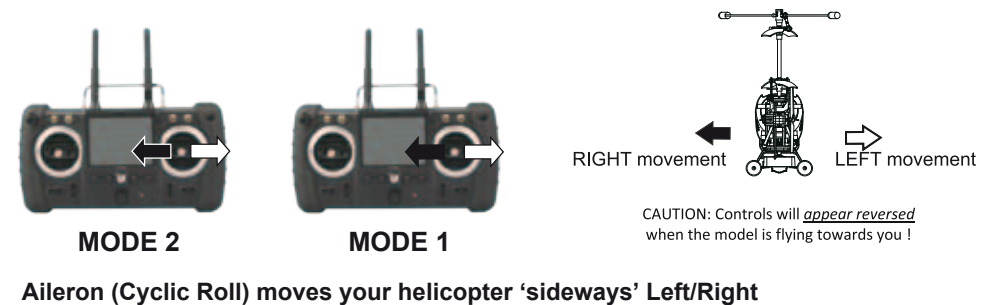
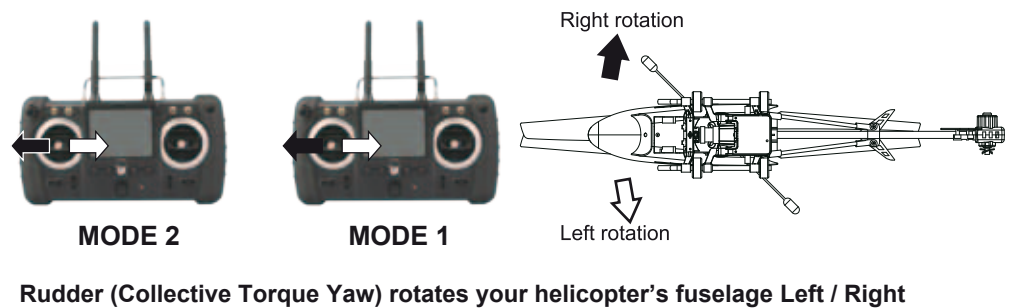
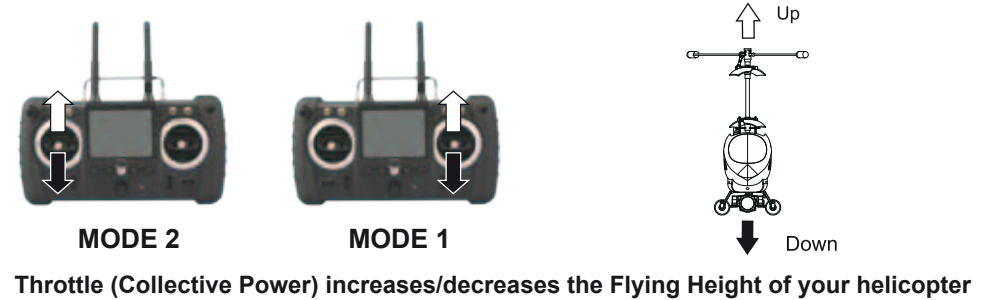
4.2.6 Plane/Helicopter MODE REVERSE SET UP

Hold down ENT key for 1 second to enter setting status. Press ENT key to enter reverse setting status. Move arrow to Plane type or Helicopter type by up/down key, Press ENT key to choose reverse and then hold EXT key for 2 seconds to confirm and exit.

5805	HUBSAN	7.7V
Set reverse	X	
Set sensitive	X	
→ Plane type	Helicopter	
Expert mode	Yes	
Stick mode	Mode 2	

6.2 Effect of Control

CAUTION: To avoid loss of control: ALWAYS move the controls S-L-O-W-L-Y! Be aware that control inputs will reduce available lift (see 'Helicopter Principles of Flight'). Be ready to use a little extra Throttle to maintain height during maneuvers.



CAUTION: Controls will *appear reversed* when the model is flying towards you !

5.4 Fitting the LiPo battery

The supplied LiPo battery is mounted inside a cradle on the underside of your helicopter's fuselage.



The LiPo battery should be mounted with its connecting cables facing towards the rear of the helicopter

DO NOT connect the cables at this time

6. Flight Training

Your RC helicopter is an easy-to-fly model built, you don't become an expert pilot without taking time to learn the basics. As the saying goes:

*There are Old pilots, and there are Bold pilots...
...But, there are no Old Bold pilots!*

In other words, if you don't want your first few flights to end in a pile of mangled wreckage-requiring expensive repairs to your new model – take the time to follow this brief Flight Training Program. After all, learning to fly your helicopter is all part of the enjoyment!

6.1 Power-On (Failsafe) Procedure

Your RC helicopter's 4-in-1 Gyro Receiver is fitted with a Power-On failsafe. This is designed to ensure that the helicopter's motor will not start unless it detects a suitable radio-control signal when the LiPo battery is connected. The correct Start-Up sequence is as follows:

4.3 SENSITIVITY SET UP

4.3.1 RUDDER SENSITIVITY SET UP- NOR MODE

Hold down ENT key for 1 second to enter setting status. Enter set sensitive status by up/down key, Press RUDDER TRIM KEY to idea sensitivity and then hold EXT key for 2 seconds to confirm and exit.

5805	HUBSAN	7.7V
Set reverse	X	
Set sensitive	-	
Elevator	40	
Aileron	50	
Rudder	50	
Plane type	Helicopter	
Expert mode	No	
Stick mode	Mode 2	

4.3.2. ELEV SENSIVITY SET UP- NOR MODE

Hold down ENT key for 1 second to enter setting status. Enter set sensitive status by up/down key, Press ELEVATOR TRIM KEY to idea sensitivity and then hold EXT key for 2 seconds to confirm and exit.

5805	HUBSAN	7.7V
Set reverse	X	
Set sensitive	-	
Elevator	40	
Aileron	50	
Rudder	50	
Plane type	Helicopter	
Expert mode	No	
Stick mode	Mode 2	

4.3.3 AILE SENSIVITY SET UP- NOR MODE

Hold down ENT key for 1 second to enter setting status. Enter set sensitive status by up/down key, Press AILERON TRIM KEY to idea sensitivity and then hold EXT key for 2 seconds to confirm and exit.

5805	HUBSAN	7.7V
Set reverse	X	
Set sensitive	-	
Elevator	40	
Aileron	50	
Rudder	50	
Plane type	Helicopter	
Expert mode	No	
Stick mode	Mode 2	

4.4 FPV MODULE

4.4.1. Your FPV helicopter equipped with a video camera, mounted under the bottom of helicopter, you can push the camera upward or downward to adjust the angle of aerial photography, please see the picture shows



4.4.2 Keep the FPV 5.8Ghz antenna straight downward as possible as you can to ensure the live video more clear and lower the interference from others, please see the picture shows(4.4.2).



4.4.2



4.4.3

4.4.3. Live video distance is around 50-100 meters, Please keep your transmitter antenna point to the helicopter as possible as you can so that you can have more clear and continuing live video(4.4.3).

4.3 Battery Mounting

Notice:

- >Do not mix old and new batteries
- >Do not mix different types of batteries
- >Do not charge non-rechargeable battery.



Open the cover



Take out the holder



According to the correct polarities, install 8 x AA battery



Insert the plug into the power jack



Return the holder back to the compartment

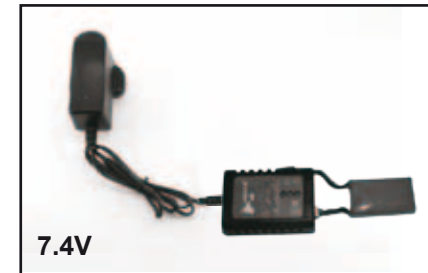


Fasten the screw

5 Li-Po Battery Charging

5.1 The helicopter is equipped with a LiPo battery:

7.4V 2 Cell 650mAh x 1 unit



7.4V

5.2 Connect battery to balance charger and wall charger, The two led lights is red whilst charging and turns green when charging is finished.

5.3. Please refer to 2.2. Safety Advisory Notice

Always partially charge your LiPo battery before storage. LiPo batteries retain a charge over a reasonable period; It is not normally necessary to recharge stored LiPo batteries unless stored for periods longer than 3-6 months.

If your LiPo battery has been over-discharged, it will not be possible to recharge it again.



LiPo Battery Disposal & Re-Cycling



Lithium-Polymer (LiPo) batteries must not be placed in with household refuse. Please contact your Local Authority (Council) or the supplier of your model for local regulations and the location of your nearest LiPo battery recycling centre.

TEMPORARY STORAGE of DAMAGED LiPo BATTERIES:

Bury the LiPo battery in a bucket of dry sand or (if discharged) the battery may be neutralized by immersion in a salt water bath. If in doubt: always seek expert advice!

FCC warning statement:

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

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

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.