

T380 Quad-copter Manual version

V2.0

(25Aug, 2011)

● **Safety Precautions:**

1. Please read this manual before building and flying the aircraft.
2. The product is remote control model, people without independent ability; please do not operate it to avoid any adverse consequences.
3. Take necessary measures to prevent being hit by the rotating blades or motors and avoid personal injury.
4. If you have never built a quad-copter before, we advise you to seek help and guidance from someone who has.

● **Disclaimer:**

1. Do not use this product for illegal reasons or purposes.
2. Our company and our dealers bare no responsibility on how this product is utilized.
3. This model contains a large number of sophisticated components and electronics, which may fail overtime. Our company and our dealers assume no responsibility to any losses, be it direct and indirect as a consequence to this failure.

Agreement

Upon purchasing this product, you automatically accept to the above agreements.

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Foreword

Before utilizing T380 quad-copter, please read this instruction carefully. It will help you to understand and know how to use it with less time. If there still have some points can't be realized during this reading, please contact us, you will get optimal answer and help here. In order to provide optimal service for you, please purchase this product via legal channel. People utilize our product in illegal action or any other unclear places, including get this product via illegal channel, cannot share our relative service support.

To any illegal behavior which people copy our products and distributing, marketing, circulating, our company will claim for their legal liability.

Base on the continuous improvement and enhancement of product manufacturing techniques and producing workmanship, we maintain our rights on changing instruction and product parts, parameter index at any time; therefore we will not inform our customer. You may know the latest product development by visiting our website, welcome to send us any feedback of your feeling, opinions and suggestions at any time.

I Brief introduction

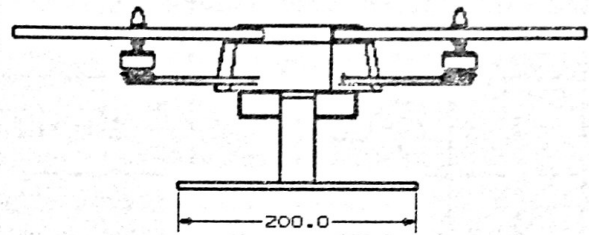
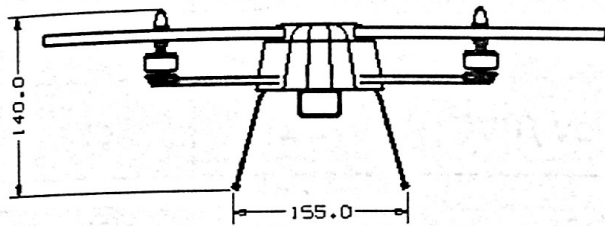
1. Function and features

T380 quad-copter is a mid-level aircraft designed mainly for FPV players.

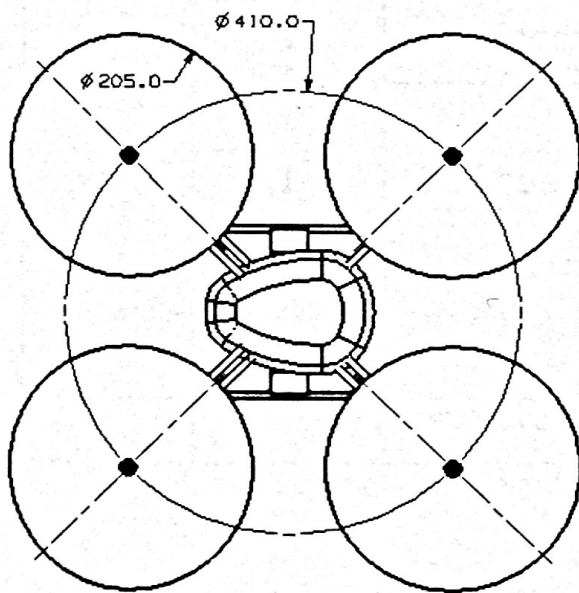
- 1) High efficiency: 8inch slow fly propellers and Disc brushless motors, the optimal efficiency is able to reach 9g/W.
- 2) Stability: utilizes a high-performance MEMS sensor for 6DOF stabilization with low drift, shock resistance ability.
- 3) Simple: a minimum 4remote control proportion channels are required to fly, Property core system, it is compatible to all RC equipments.
- 4) Easy to operate: Can be installed in a few minutes.
- 5) The T380 can take off and land vertically, altitude hold, hover, fly left and right, etc.

Left space in the front of the aircraft for camera installation

2. Aircraft dimensions

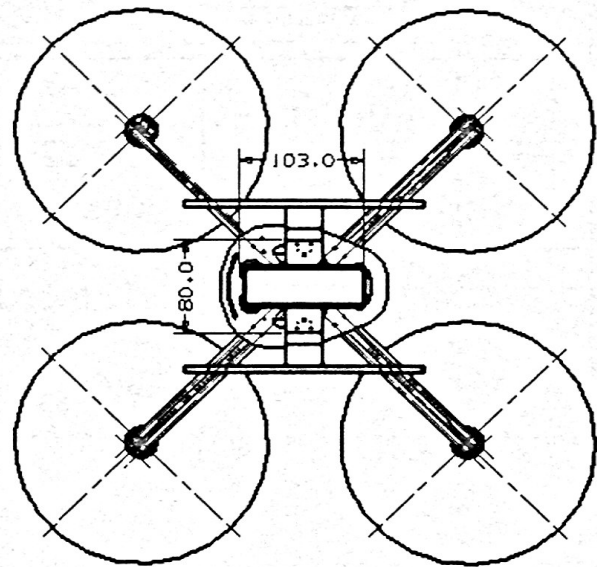


Aircraft dimension



Rotating diameter

(mm)



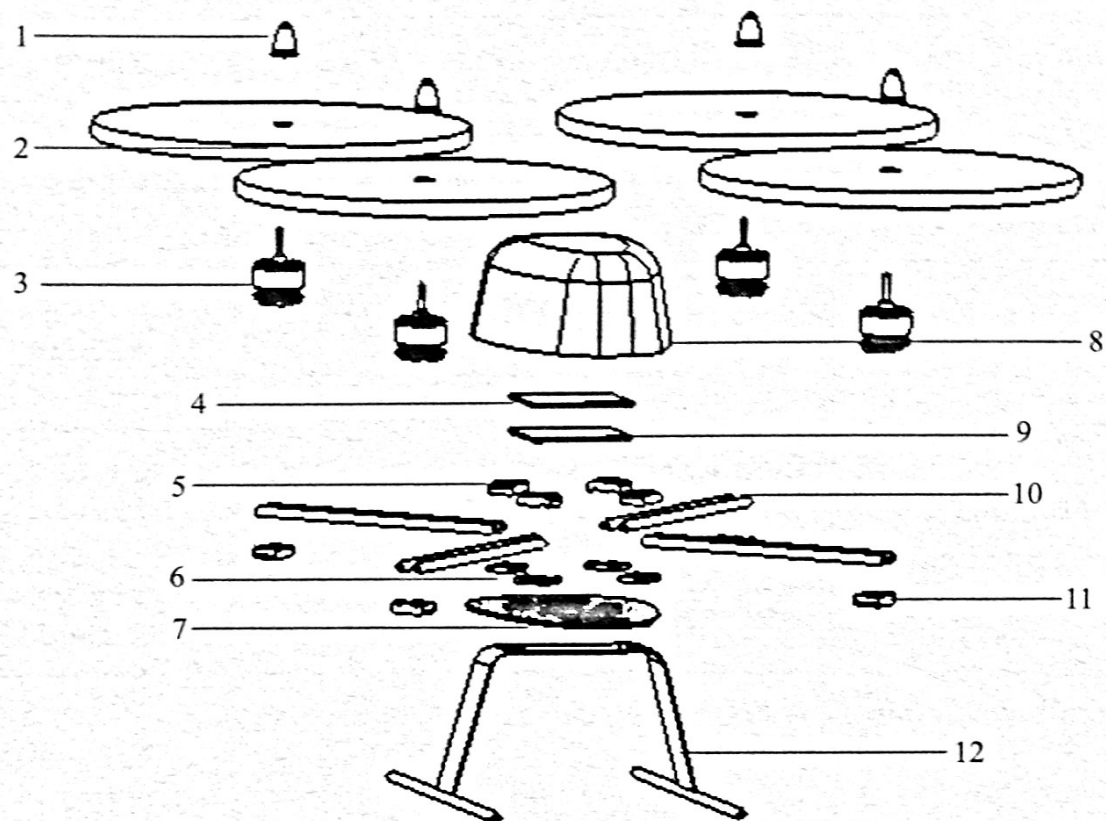
battery placement (1P/2P)

3. Configuration and specifications

No	Names	Specification	Quantity	Unit
1	Cover	aluminum alloy /PVC	1	Set
2	Arm beam	Glass fiber	8	Pcs
3	Landing gear	Aluminum alloy/glass fiber/rubber	1	Set
4	Motor	C2208 KV900 Out-runner brushless motor	4	Pcs
5	Propellers	8045 Plastic composites	2	Pair
6	Brushless ESC	2-3S 12A high speed ESC	1	Pcs
7	FC system	Inertial attitude self-stabilization system	1	Set

4. Technical parameters

Aircraft size	410x410x140	mm
Maximum expandable size	615x615x140	mm
Motor to motor	Diagonal distance between two motor centers	410mm
Propellers	frontal and versa professional props 8045	8inch
Battery	LiPo 3S 2200mAh 20C	standard1P
Aircraft weight(kit only)	Without battery, receiver, applicable payload	430gram
Take-off weight	3S 2200mAh 1P battery, receiver	610gram
Recommended payload	Camera and mount	≤380gram
Maximum payload	Use standard 1P battery	≤380gram
Maximum takeoff weight	Use standard 1P battery	1300gram
Flight distance	Visual area	-
Flight time	3S 2200mAh 1Pbattery, receiver	18~25mins
Wind resistance	≤4	Class

II. Components' names**1. Major body components (Aircraft exploded view)**

No.	Components Name	Quantity
1	Propeller clip	4
2	Propeller	4
3	Brushless Motor	4
4	FC	1
5	Locking block (arm beam1)	4
6	Locking block (arm beam2)	4
7	Bottom cover	1
8	Cover	1
9	ESC	1
10	Arm beam	1
11	Motor locking block	4
12	Landing gear	1

T380 Quad-copter

2. Electronics

- 1) 12A Maximum output load, 4 brushless motors.
- 2) Motor and ESC overload and burn-out protection: once overloading is detected, motors will be turned off gradually.
- 3) FC with six high-performance micro MEMS transducer to achieve the stable, reliable and drift-free stabilization.

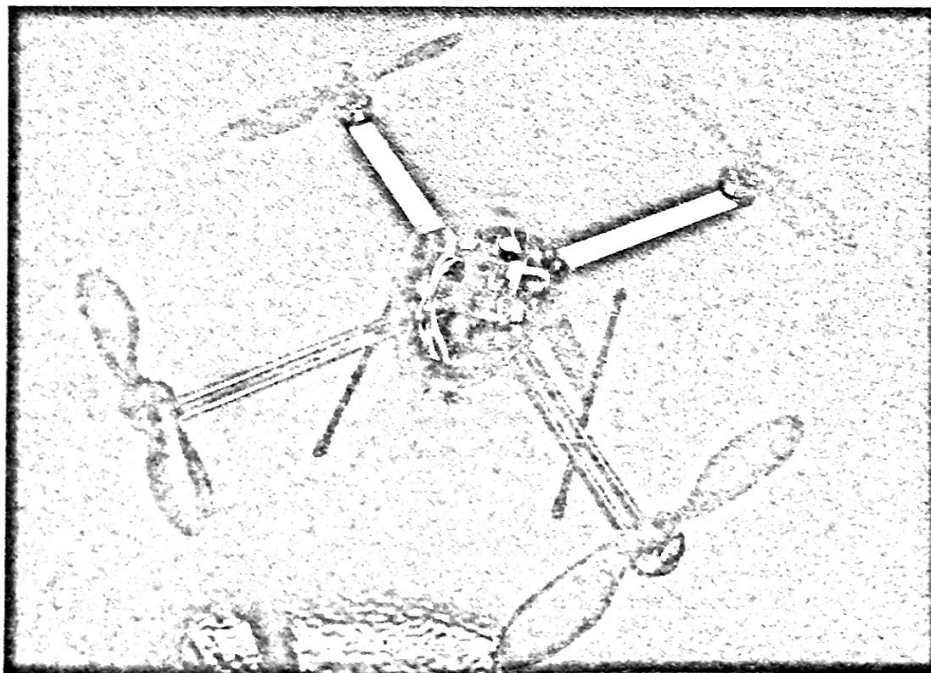
3. Software system

1. The fuzzy logic algorithm, the aircraft stabilization is proprietary and intellectually protected worldwide.
2. The T380 system has been fully field tested and intuitively easy to fly.

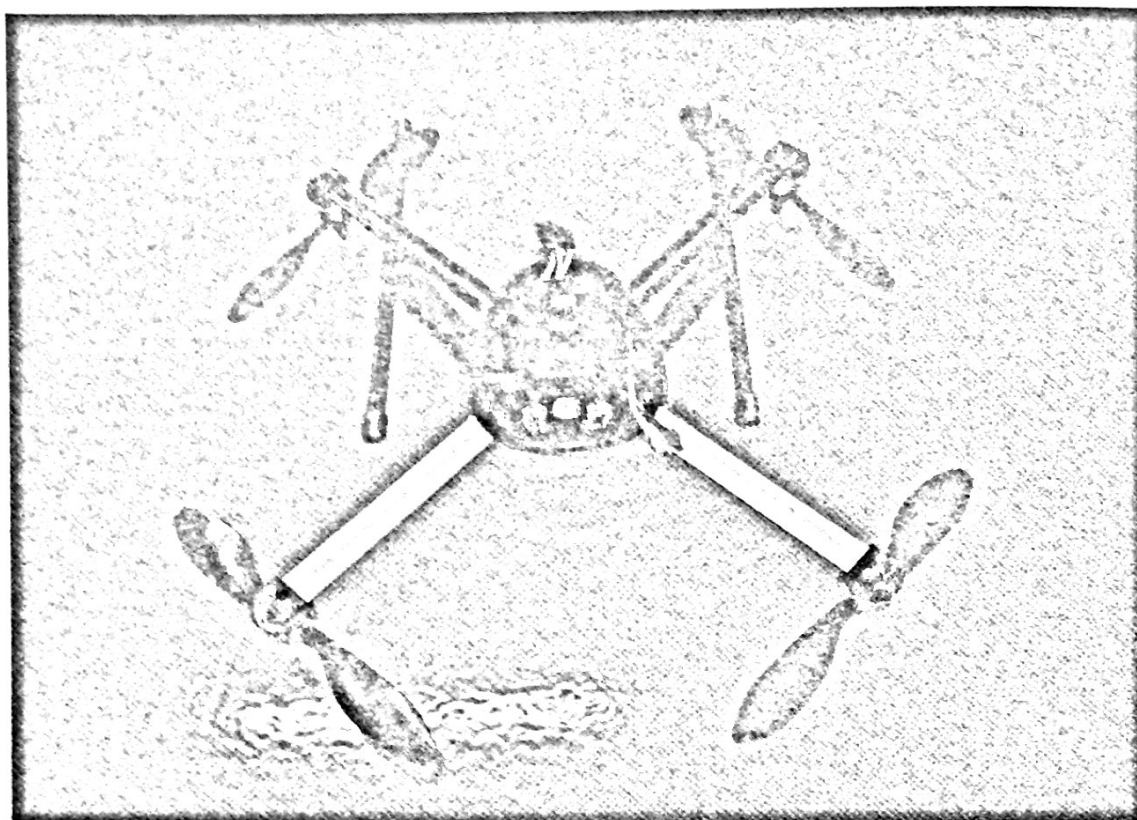
III. Assembly

1. Main body

- 1) In order to ensure the optimal configuration, T380 aircraft has been mounted and passed flight test before the delivery.



Aircraft (with main parts)



Bottom view

- 2) Users only need to install propellers, landing gear and RC receiver.

Locate LG at the bottom of the airframe tightly by M3 bolt, screw nuts down till LG is installed at right place snugly. (In case of break plastic chassis, please do not screw it too tight.)

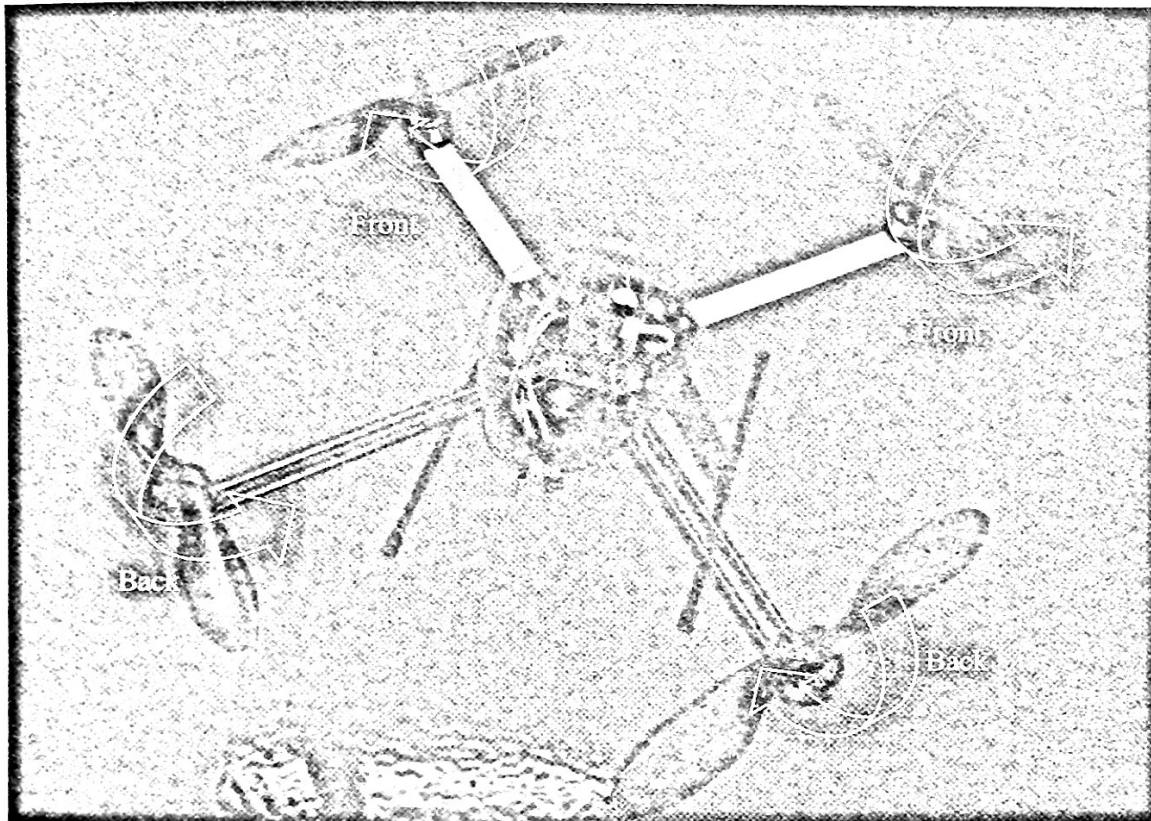
- 3) Install T type slot of battery at the bottom of the fuselage, notice that you need a same-designed, female T type plug, (a standard Deans Ultra connector)
- 4) Hold 3S1p battery, install Velcro we offered on the cross beam of the LG.

2. Propeller mounting

- 1) There are four 8 inch high efficiency slow fly propellers.

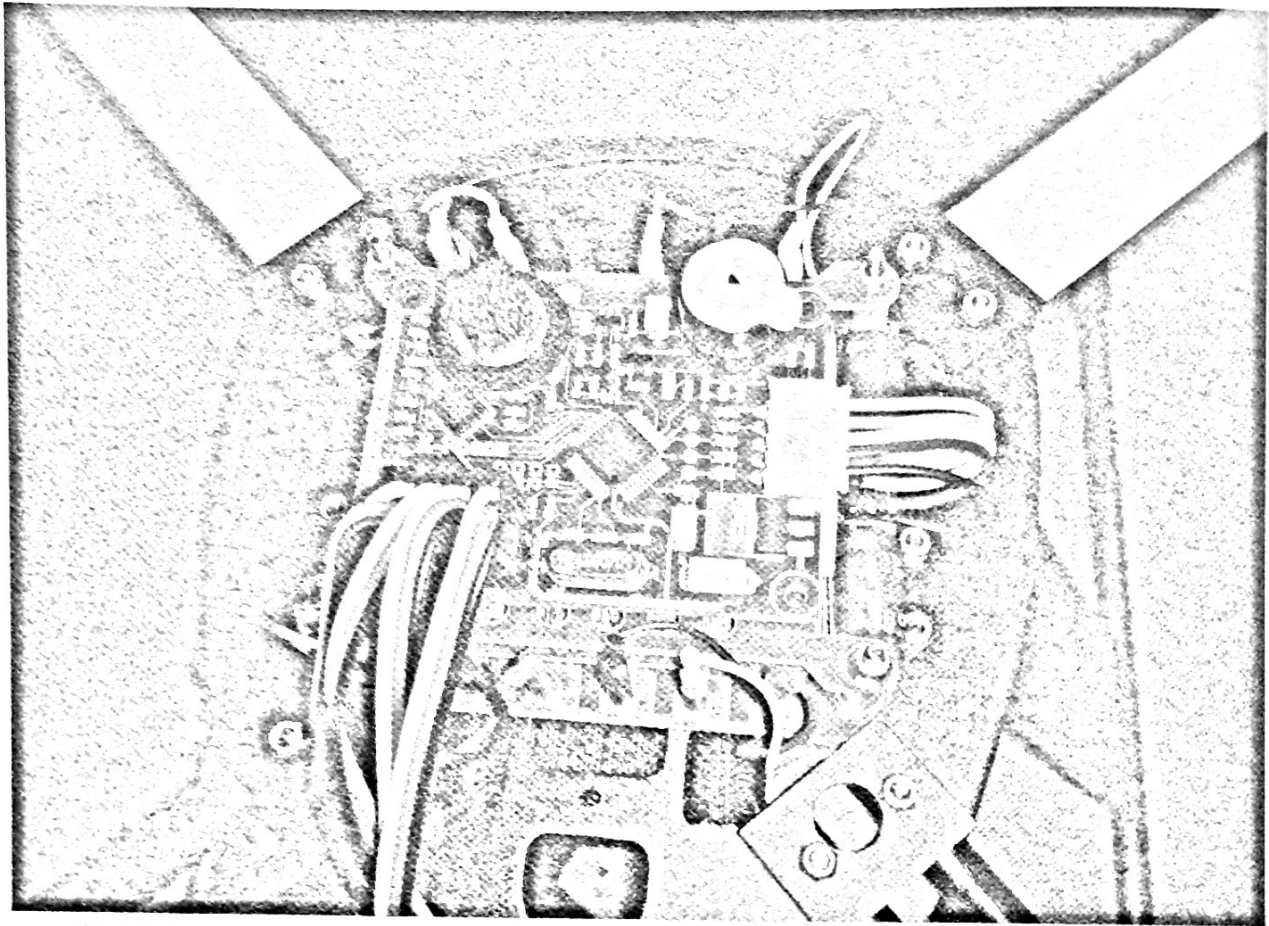
T380 Quad-copter

- 2) Install propellers on motor shaft directly, and screw down propeller clips.
- 3) Keys: Use Loctite or other thread locker when installing the Aluminum Blade Holder. This is to prevent it coming off during flight.
- 4) Propeller rotation (pay attention to the "front" direction)



3. Remote control receiver device.

- 1) A minimum 4 channel Receiver is required to fly this system.
- 2) T380has been tested to work with major brands of RC Radios, including Spectrum(DX), JR(DSX7,9XII),Sanwa (RD8000), Futaba(6EX,10C,FF9), Hi-TEC(Eclipse7), GWS, WFLY(FT06-C),ESKY, etc.
- 3) Plug in the corresponding channels as shown below to your RC Receiver.



T380 Input	Corresponding Receiver Channel	Example: Futaba Receiver	Example: JR Receiver
CH 1	Aileron Input	Channel 1	Channel 2
CH 2	Elevator Input	Channel 2	Channel 3
CH 3	Throttle Input	Channel 3	Channel 1
CH 4	Rudder Input	Channel 4	Channel 4
CH 6	Camera Angle Control Input (Optional)	Channel 5	Channel 5

4. Radio settings

- 1) Set your transmitter on fixed wing mode.
- 2) Set the end points of Channel 1, 2, 3 and 4 to between 0-100%.

- 3) Remove or disable any mixing between channels.
 - 4) Set a straight line curve for Throttle channel. You may fine tune this curve later.
5. Powering up for the first time.
- 1) Turn on your Radio transmitter, move the Throttle stick to the lowest position (zero throttle).
 - 2) Place the aircraft on level ground, install your LiPo battery and power up.
You will hear some beeps indicating power is on.
 - 3) Do not move the aircraft until the initialization process is completed (indicated by 3 beep-beep-beep tones).

Initialization Beep Tones:

No.	Beep	Indication
1	First Beep Tones after 2 seconds	Indicate battery is connected.
2	Second Beep Tones after Power Switch is turned on.	RC signal is detected and the lowest throttle position is identified.
3	Final Beep Sound after 6 seconds: "Beep Beep Beep"	Flight Control System is initialized and aircraft is ready to fly.
4	Beep before flight (after throttle stick is pushed up).	The aircraft confirms throttle stick has been moved and propeller will now start to rotate.

IV. First flight

1. WARNING: PLEASE READ BEFORE YOUR FIRST TEST FLIGHT.

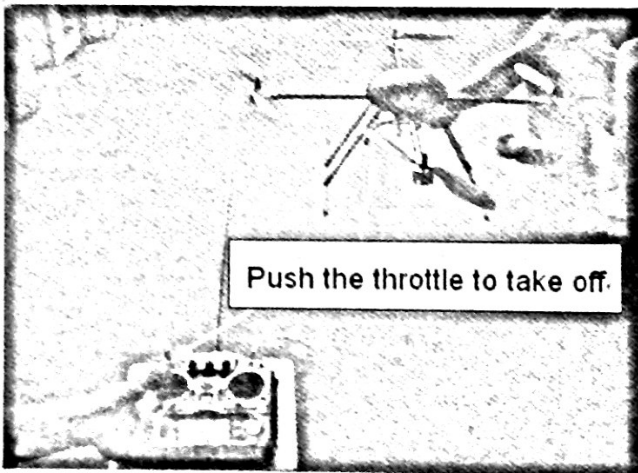
- 1) Default factory setting for the T380 "Cross Mode" configuration.
- 2) Two of the Motor Arms are colored yellow as a marker to indicate the front side.
- 3) To ensure your safety, the following flight tests must be done carefully with small controlling increments.

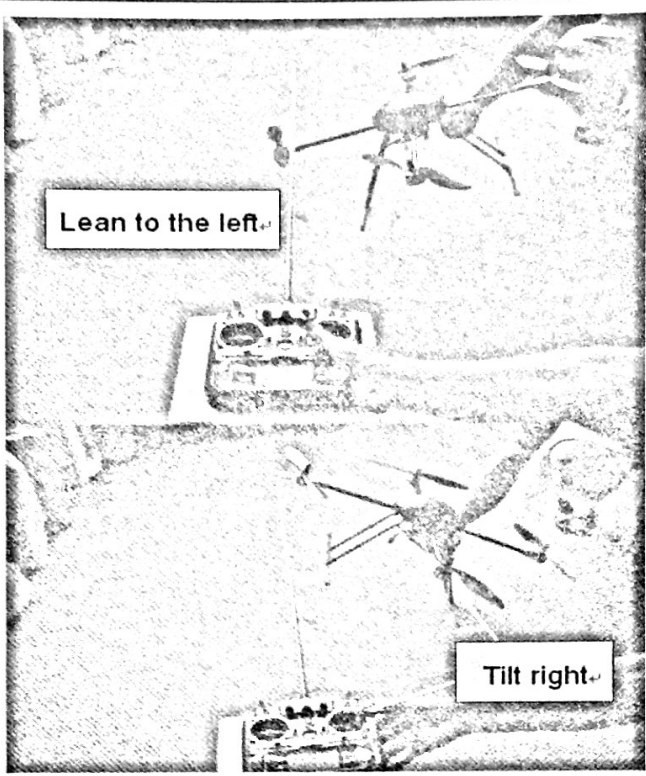
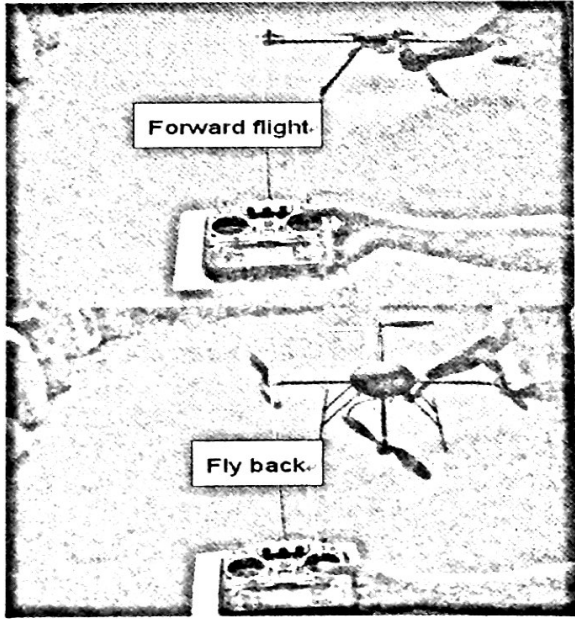
2. Control direction

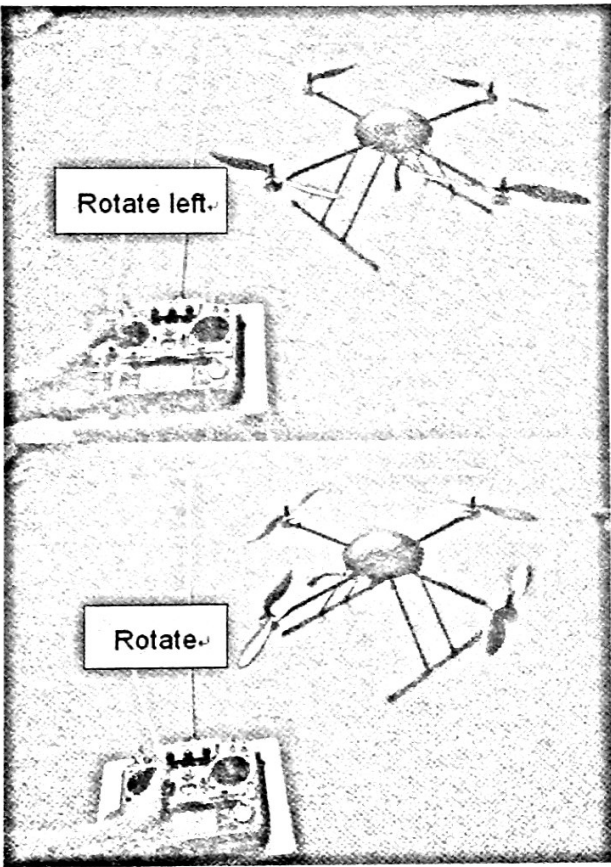
To check your RC Transmitter control settings, carefully test as instructed below.

If the movement is incorrect, reverse the channel accordingly.

Safety note: this can be successfully done without the propeller installed.

No.	Control Input	Aircraft Reaction
11	Increase Throttle Gently (do not lift off!)	Motor revs up and down as per throttle input: 
22	Manually checking control direction.	<ol style="list-style-type: none">1. Carefully hold the aircraft by hand.2. Gently increase throttle until the motors just begin to rotate.

33	Roll left / Right	 <ol style="list-style-type: none"> 1. Move the Aileron stick to the left; you should observe the right motor speed up while the left motor slows down. 2. Observe the opposite when rolled to the right
44	Forward / Back	<ol style="list-style-type: none"> 1. Move the Elevator stick to the front. 1) You should observe the back motor speed up while the front motor slows down.  <ol style="list-style-type: none"> 2) Observe the opposite when Elevator stick is moved to the back.

5	Rudder left / right (direction of rotation)	 <p>The top photograph shows a quadcopter being rotated to the left, with a label 'Rotate left.' pointing to the rudder stick on the transmitter. The bottom photograph shows the quadcopter being rotated to the right, with a label 'Rotate.' pointing to the rudder stick.</p> <ol style="list-style-type: none">1. It is easier to check correct rotation if the aircraft is allowed to lift off slightly (do not hold the aircraft in your hand if you do this!).2. If you move the rudder stick to the left, the aircraft should rotate to the left, and vice versa.
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3. Lift off and hover

- 1) After you have tested and confirm all 4 channels in your RC radio are set up correctly, it's time for your first flight.
- 2) As before, place the ARF on the flat ground, turn on the power and go through the initialization process. Do not move any control sticks or the aircraft during this process.
- 3) Gently move your throttle to start all motors. Push the throttle stick higher until the aircraft begins to lift off and fly.
- 4) If the ARF looks stable, allow it to hover, maintain altitude before gently bringing the throttle stick down for a soft landing.

- 5) Continue to test hover the aircraft, flying low and slow until you get used to its characteristics before going into higher altitude and forward flight.

4. Built in safety features

1) Loss of RC signal

- a. In case of RC signal is not detected during flight, the aircraft will automatically enter the security protection mode (SPM).
- b. In SPM, the aircraft will emit a long "b-e-e-e-e-p" tone intermittently.
- c. The aircraft will not fly until a RC signal is received by the controller.

2) Start-up throttle protection

- a. During power up, if your radio throttle stick is not in the lowest position (zero throttle), the SPM will be activated.
- b. In this state, the aircraft will not respond to any command until the throttle stick is placed in the lowest position.

3) In-flight Protection during RC signal lost

- a. If RC signals is lost or interrupted while in flight, the aircraft will immediately self land.
- a. And intermittent beep tone would also be emitted.
- b. When RC signal is regained, this protection will be deactivated and the aircraft can continue flying.

4) Low battery protection

- a. Upon detecting low battery, the aircraft will beep intermittently while still flying.
- b. Please land as soon as possible and replace a battery.
- c. If this warning is ignored, the aircraft will slowly power down and self-land.
You still have flight control during this time, but not throttle control.
- d. Default is 3.2 volts per LiPo cell.

5) Beeping tones summary

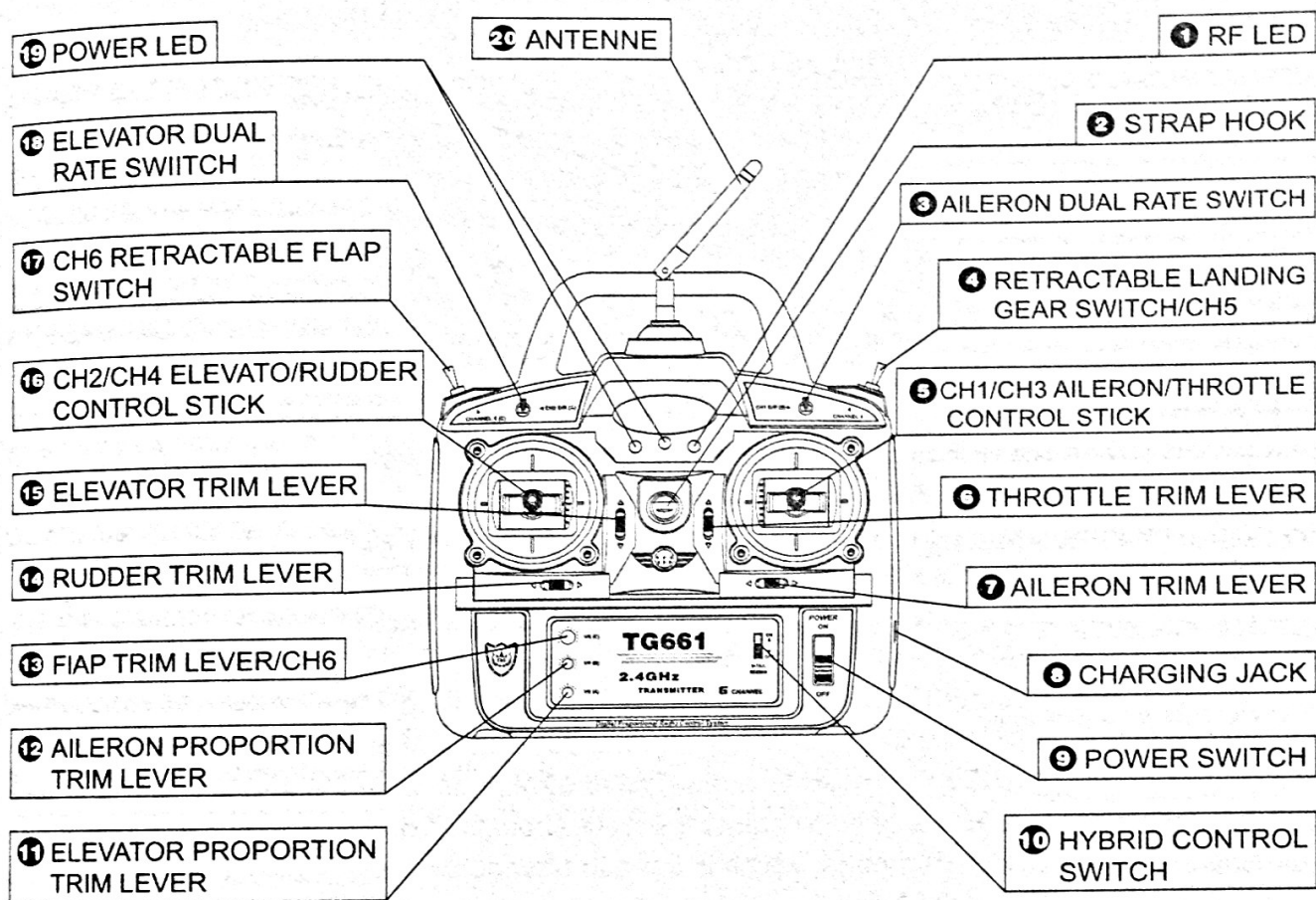
No.	Alarm sound	Indicator for:	Action Required
1	Beeping sound during flight. Motor power down.	Low battery	Replace battery
2	Intermittent long beeps	No RC signal detected or throttle stick is not zero at start up.	Check your radio transmitter
3	Quick Beeps during flight	Low battery or the RC signal was lost	Check battery voltage and RC connection.
4	Quick Beeps and flight control is not allowed	Low battery or the RC signal was lost	Check the batteries and RC Connection

V. Feedback

We would like to hear from you to improve both the product and our services.

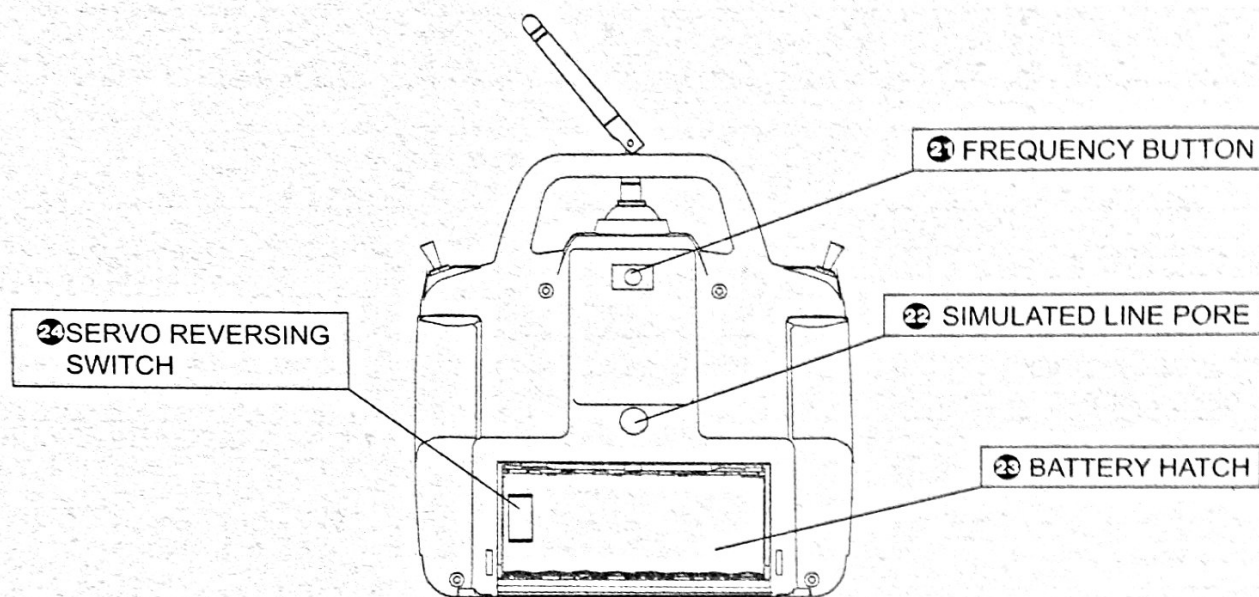
Please do not hesitate to contact us via email:

1. FUNCTION OF THE TRANSMITTER



(DIAGRAM MODE1 RIGHT THROTTLE CONTROL STICK)

- 1 RF LED:** If RF LED is blue after turning on, it indicates the RF module is working normally. If RF LED isn't light, there is something wrong with the RF module, so you couldn't control the receiver properly and the airplane model couldn't take off.



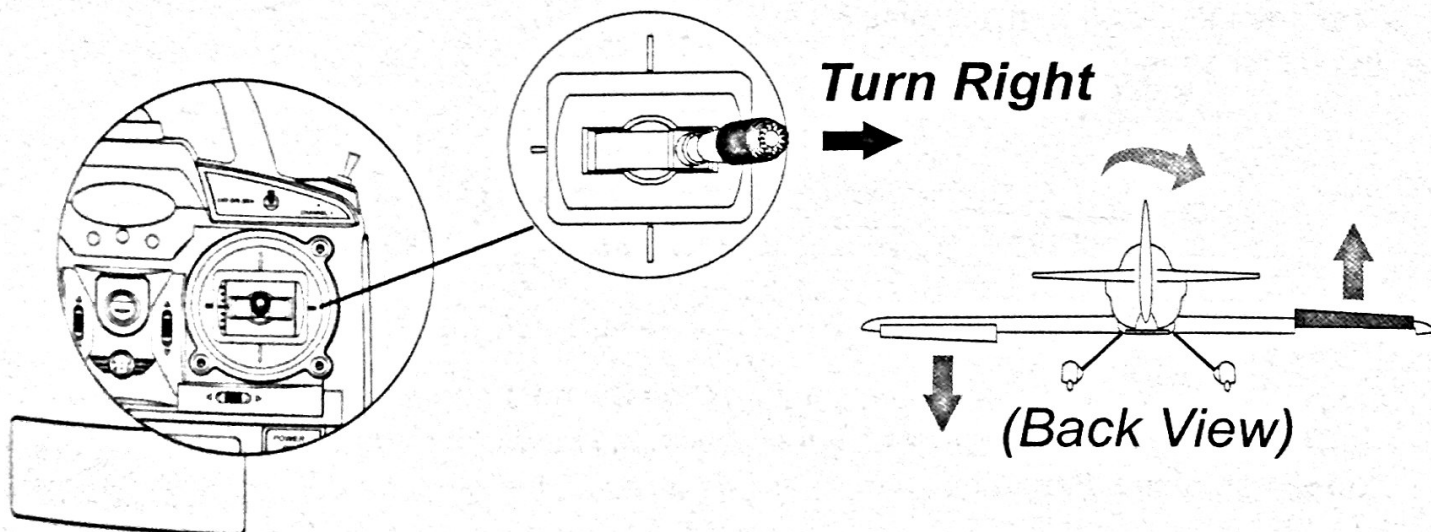
- ② **STRAP HOOK:** Be used to connect the strap ring.
- ③ **AILERON DUAL RATE SWITCH:** Use this switch to "shift" between two aileron(CH1) control throw settings. The throws are greater ("big rate") and the largest travel is 100% when the switch is "UP". The throws are less ("small rate") and the largest travel is 20%~80% when the switch is "DOWN".
- ④ **RETRACTABLE LANDING GEAR SWITCH/CH5:** Push the button forward, the landing gear will send out. Push the button backward, the landing gear will take back. *(Please read page 7)*
- ⑤ **CH1/CH3 AILERON/THROTTLE CONTROL STICK:** This control stick can operate the servos connected to channel 1(aileron) and channel 3(throttle) of the transmitter. *(Please read page 4~5)*
- ⑥ **THROTTLE TRIM LEVER:** It's used to adjust the neutral position of the throttle(CH3) channel.
- ⑦ **AILERON TRIM LEVER:** It's used to adjust the neutral position of the aileron(CH1). (CH1~CH4 electric trimmer contains 30 grades, which is used to change the neutral position of response of each servo, you will hear the "beeping" sound when you change the trim stick, it will pause in the middle. If exceeding the trim scope there will be continuous "beeping" sound.) *(Please read page 9)*
- ⑧ **CHARGING JACK:** When using the rechargeable Ni-Mh battery or Ni-CH battery, please charge for the Ni-Mh(Ni-CH) battery when the red light begins flashing. This interface can't link DC directly. (This product is not contain charger, please buy the charger by yourself). *(Please read page 11~12)*
- ⑨ **POWER SWITCH:** Used to turn on and turn off the electric power of Transmitter. (Up is ON, Down is OFF.)
- ⑩ **HYBRID CONTROL SWITCH:** Used to turn on and turn off aileron/hybrid control of aileron and elevator. (Up is ON, Down is OFF.)
- ⑪ **ELEVATOR PROPORTION TRIM LEVER:** It's used to adjust the the travel of process servo when the elevator(CH2) is "down" and the throws are less("low rate"). The adjustment is 80%~20% of the longest travel process.
- ⑫ **AILERON PROPORTION TRIM LEVER:** It's used to adjust the travel process of servo when the aileron(CH1) is "down" and the throws are less("low rate"). The adjustment is 80%~20% of the longest travel process.
- ⑬ **FIAP TRIM LEVER/CH6:** It's used to adjust the angle of the flaps.
- ⑭ **RUDDER TRIM LEVER:** It's used to adjust the center position of the rudder(CH4).
- ⑮ **ELEVATOR TRIM LEVER:** It's used to adjust the neutral position of the elevator(CH2).
- ⑯ **CH2/CH4 ELEVATO/RUDDER CONTROL STICK:** This control stick can operate the servos connected to channel 2("elevator") and Channel 4 rudder of the Receiver. *(Please read page 6~7)*
- ⑰ **CH6 RETRACTABLE FLAP SWITCH:** Push this button backward, the flaps will sent out. Push the button inward, when the flaps is sent out, rotating VR(C) ⑬ can adjust the angle of the flaps.

- ⑬ **ELEVATOR DUAL RATE SWITCH:** Use this switch to "shift" between two elevator(CH2) control throw settings. The throws are greater ("big rate") and the largest travel is 100% when the switch is "UP". The throws are less ("small rate") and the largest travel is 20%~80% when the switch is "DOWN".
- ⑭ **POWER LED:** If the red and green LED light are light after turning on, the power of battery is normal. When the power is lower than 9V, the green light begins flashing and send out an intermissional "beeping" sound to remind you the power is not enough. So you have to land the airplane and change the battery of Transmitter or recharge it. When the power is lower than 8V, the green light off and the red light begins to flash, it will send out continuous "beeping" sound to alarm until the transmitter closed. When you hear the alarm, there is still about 4 minutes to land your airplane model before runing out of control. When fly the airplane, you should avoid the voltage of the transmitter lowered to the alarm level.
- ⑮ **ANTENNA:** Radiates radio control signals. Suggest adjusting the antenna upward or downward to get the best enhanced radiation effect.
- ⑯ **FREQUENCY BUTTON:** It's used to adjust the frequency of the receiver. *(Please read page 10~11)*
- ⑰ **SIMULATED LINE / TRAINER LINE PORE:** used to connect flight model simulator (FMS) or trainer line. *(Please read page 13)*
- ⑱ **BATTERY HATCH:** After opening the battery hatch, you can install the batteries. Be sure to use 8 alkaline batteries or 8 Ni-Mh (Ni-Mh) batteries. *(Please read page 11~12)*
- ⑲ **SERVO REVERSING SWITCH:** Use this switch to change the direction of response of each servo. Each channel has correspondent reversing switch. when you push the switch of correspondent reversing switch, the correspondent servo will rotate toward opposite direction. After using the reversing function, check all the controls on the model to be certain they are operating in the correct direction and that you did not inadvertently reverse a servo other than the one intended. Reversing the wrong servo (or not checking the response of the controls before each flight) may be the most common cause of a crash!

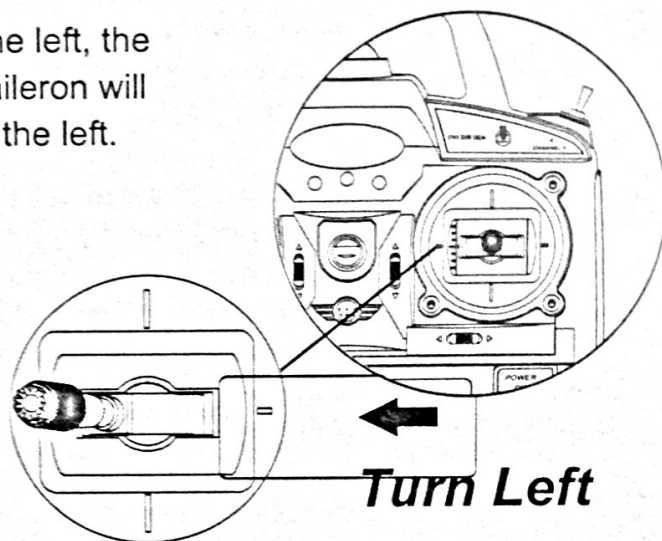
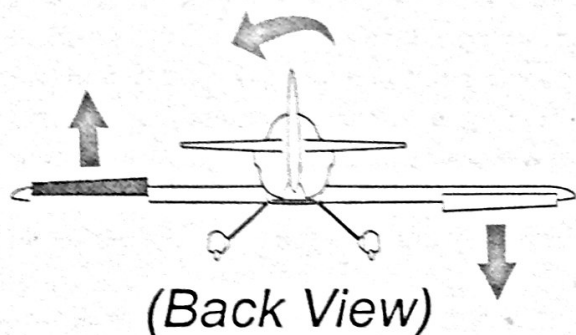
2. Function of the output channel of Transmitter

Aileron-CH1

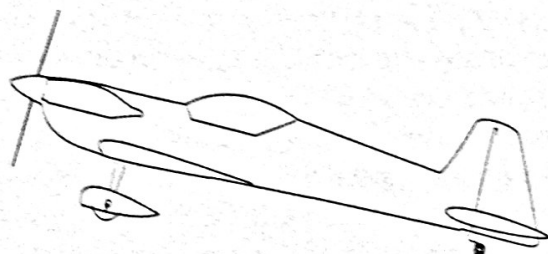
when the right control stick ⑤ is moved to the right, the right aileron will turn upward, and the left aileron will turn downward, and then the airplane moves to the right.



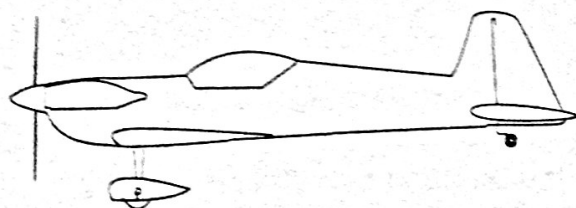
When the right control stick ⑤ is moved to the left, the right aileron will turn downward, and the left aileron will turn upward, and then the airplane moves to the left.



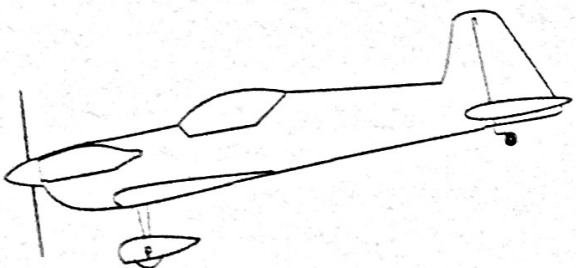
Throttle-CH3



Push the throttle stick forward,
the motor speed increase

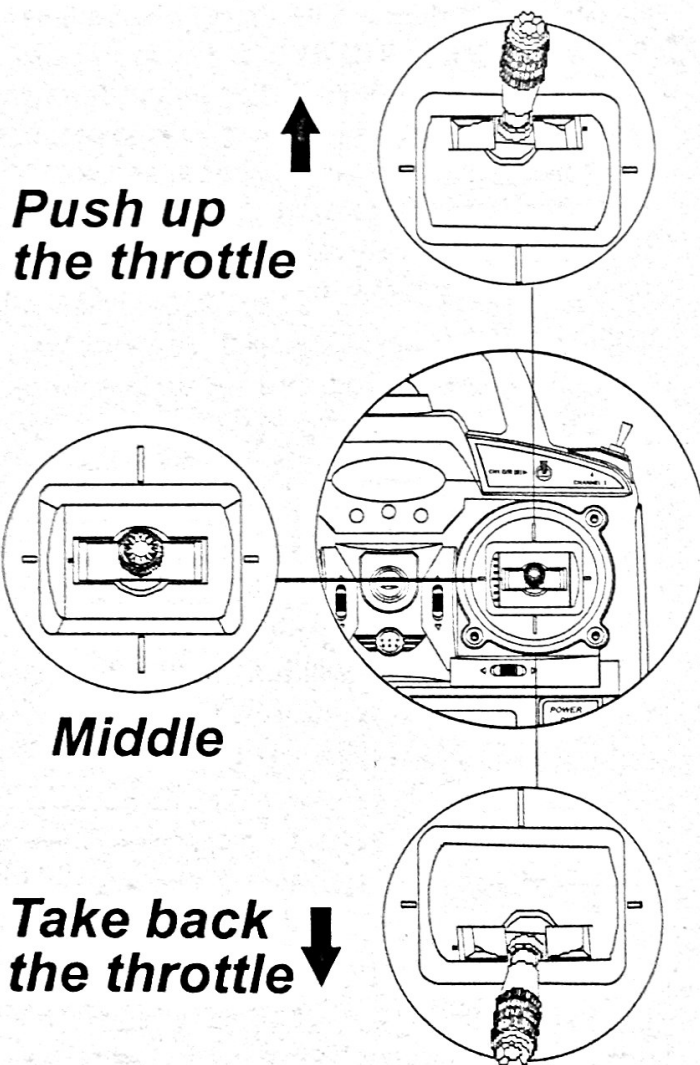


Push the throttle stick in the middle,
the motor speed in middle speed



Push the throttle stick backward,
the motor speed decrease.

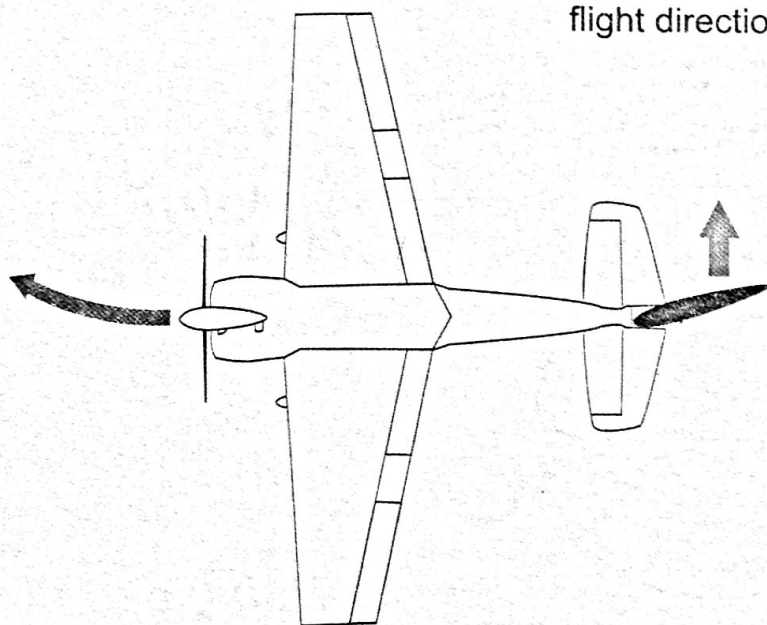
When the right control stick ⑤ is pushed up, the power of electric motor increase. As a result, the airplane lifts up.



When the right control stick ⑤ is pushed back, the power of electric motor increase. As a result, the airplane descends.

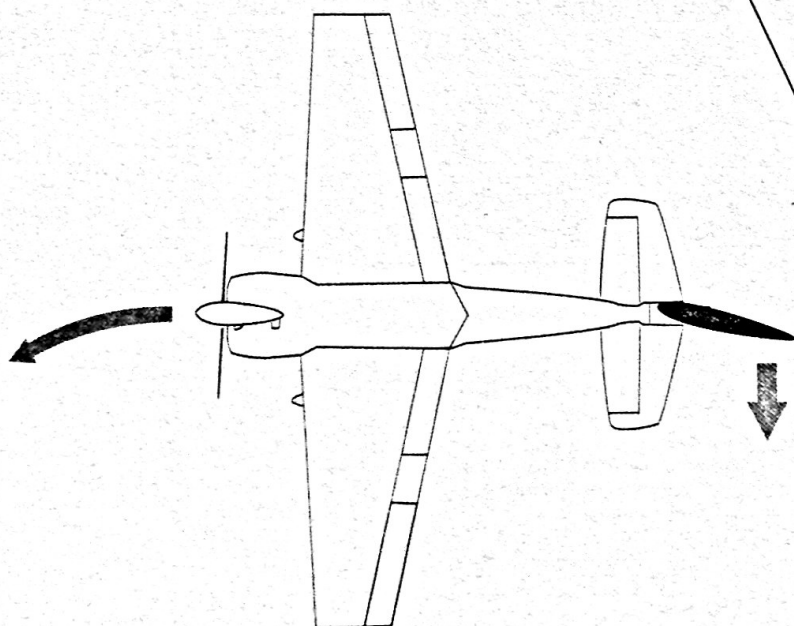
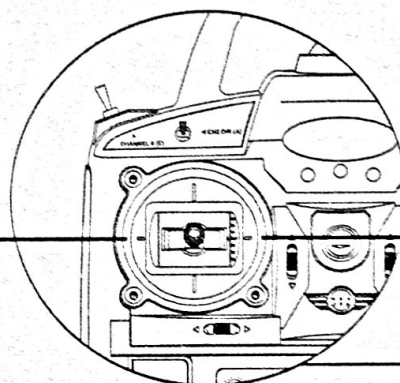
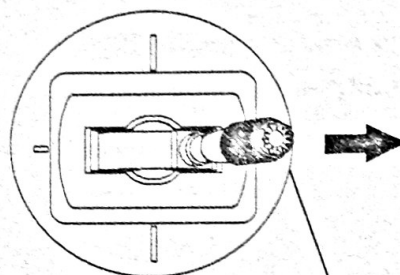
Rudder-CH4

When the left control stick 16 is moved to the right, the nose of the airplane slant to the right, and the flight direction of the airplane turns to the right.



Move the rudder stick to the right, airplane turns right.

Turn right



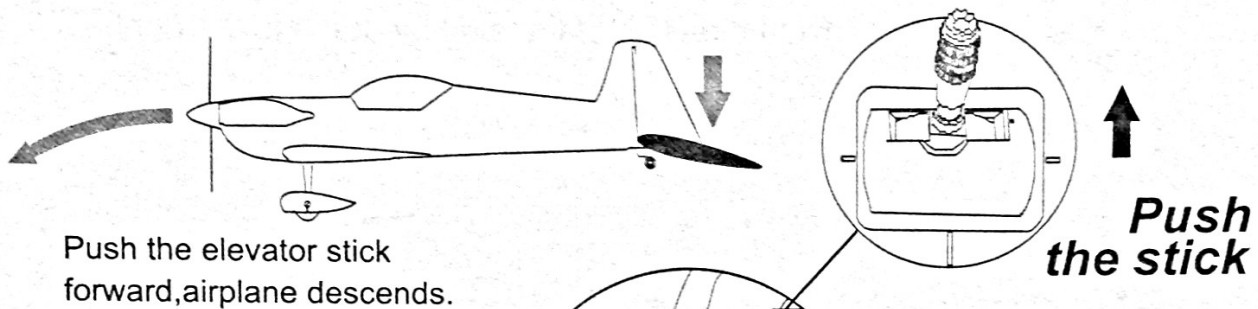
Move the rudder stick to the left, airplane turns left.

Turn Left

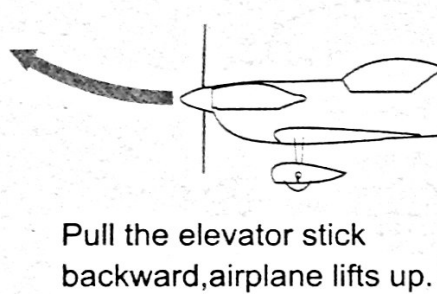
When the left control stick 16 is moved to the left, the nose of the airplane slant to the left, and the flight direction of the airplane turns to the left.

Elevator-CH2

When the elevator stick 16 is pushed forward, the nose of the airplane will tilt downward.



Push the elevator stick forward, airplane descends.



Pull the elevator stick backward, airplane lifts up.

When the elevator stick 16 is pulled backward, the nose of the airplane will tilt upward.

Pull the stick

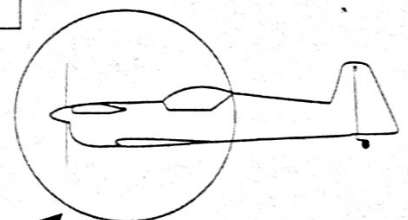
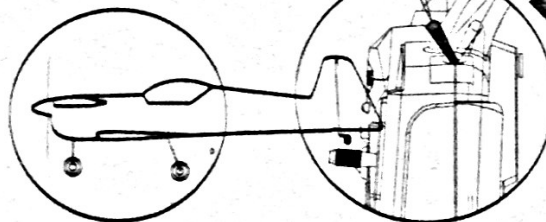
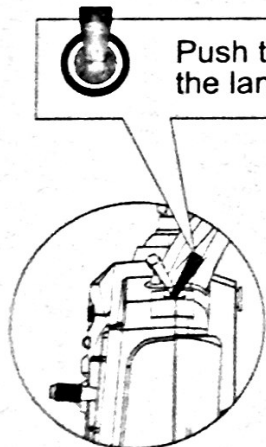
Retractable landing gear switch-CH5



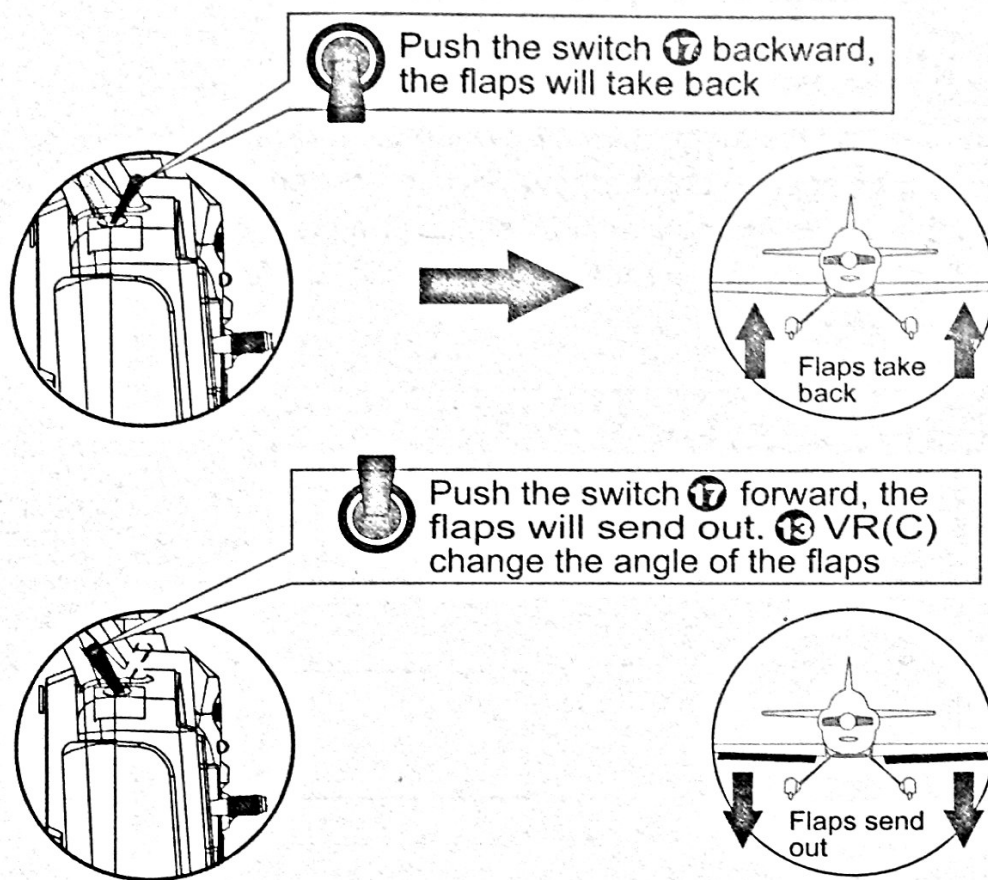
Push the switch 4 backward, the landing gear will take back



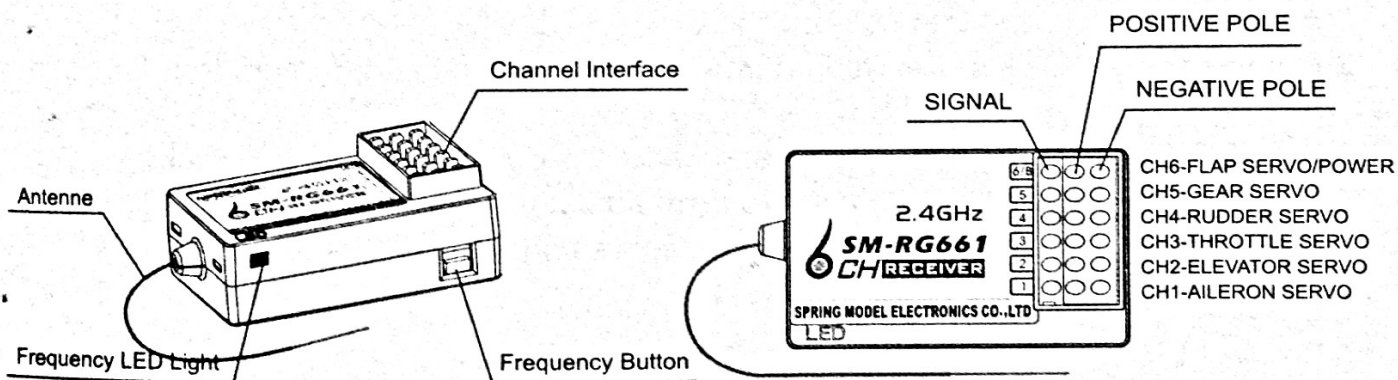
Push the switch 4 forward, the landing gear will send out



Retractable flaps switch-CH6



3.RECEIVER/ANTENNA INSTALLATION



Antenna Installation

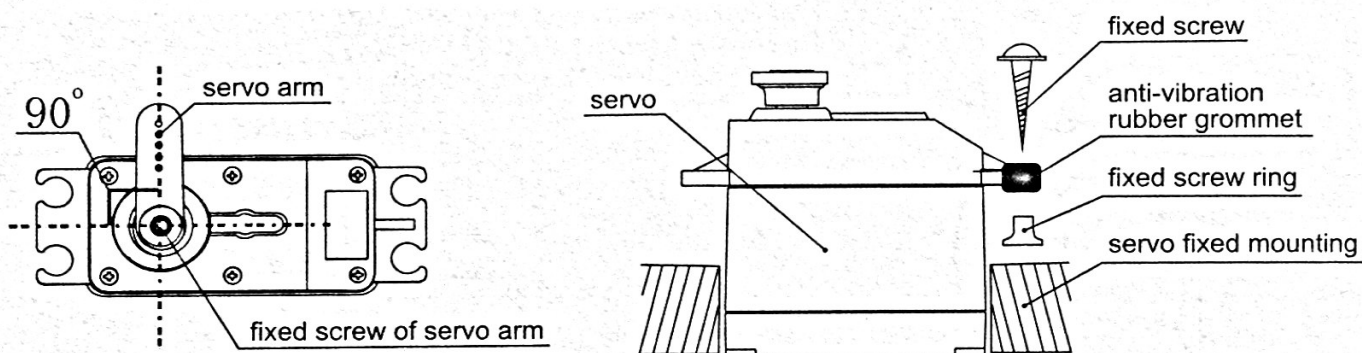
The receiver antenna could be installed inside or outside of the model. When the antenna is installed inside of the fuselage, please notice that the inside of the fuselage may be interfered by metal, carbon fiber or electric wires. So the antenna must be kept away from servos, switch, batteries and motor, and never bind together. If you want to install the antenna outside of the fuselage, please use rubber grommet

or silicon tube to protect from cutting or breaking the internal antenna connections. (Notice: The antenna must be kept away from conductive materials, such as metal, carbon fiber and so on.)

Receiver Installation

The receiver contains precise electronic components. To protect the receiver, please wrap it with foam rubber, sponge or other anti-vibration material. If wrapped improperly or the package suffered from strong vibration, shock or moisture, intermittent operation, a failure may result. Please wrap the receiver in a plastic bag for waterproof.

4.SERVO INSTALLATION



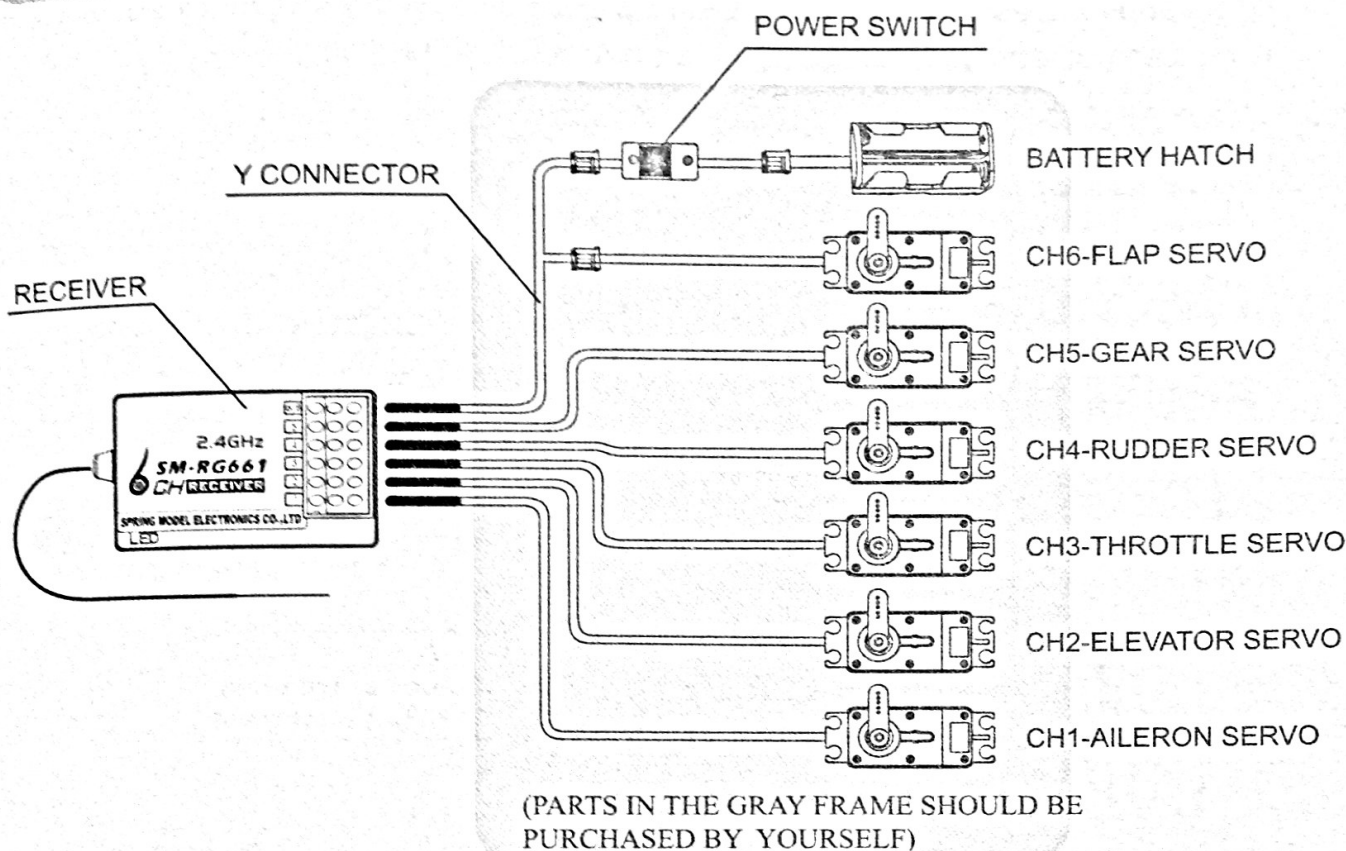
How To Set The Neutral Position Of Servo

1. Turn on the electric power of transmitter and receiver. Move the control stick and make sure that the rotate direction of servo is right. (If the direction is wrong, please use the reversing servo to set function.)
2. Put the control stick in the middle position, and adjust all trimmers to the middle position.
3. Install the servo arm on the servo, and keep it verticality with the pull stick.
4. Connect the pull stick with the servo arm, adjust the length of the pull stick and be sure that the face of servo is in the middle position.

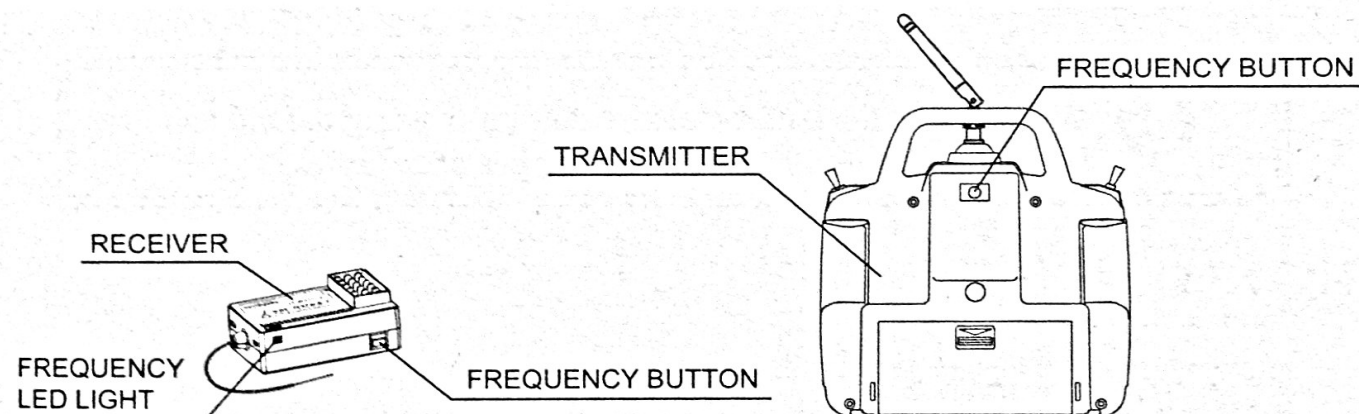
How To Set The Trim Lever

1. After the servo arms, pushrods and servo plate being installed correctly and centered, trim button will be used to adjust the balance of flight. As long as adjust the corresponding trim button according to the direction of flight the pitch of horizontal side deflective side, then the model will fly in straight line or in horizontal line.
2. If it is far away from the center, you can record the position of angle of servo, then take the servo arm off, place the servo arm and trim lever in the middle position. Adjust the length of pushrod to keep the angle of servo in the record position, you could center the trim lever of transmitter.

5.CONNECTION OF RECEIVER AND SERVO



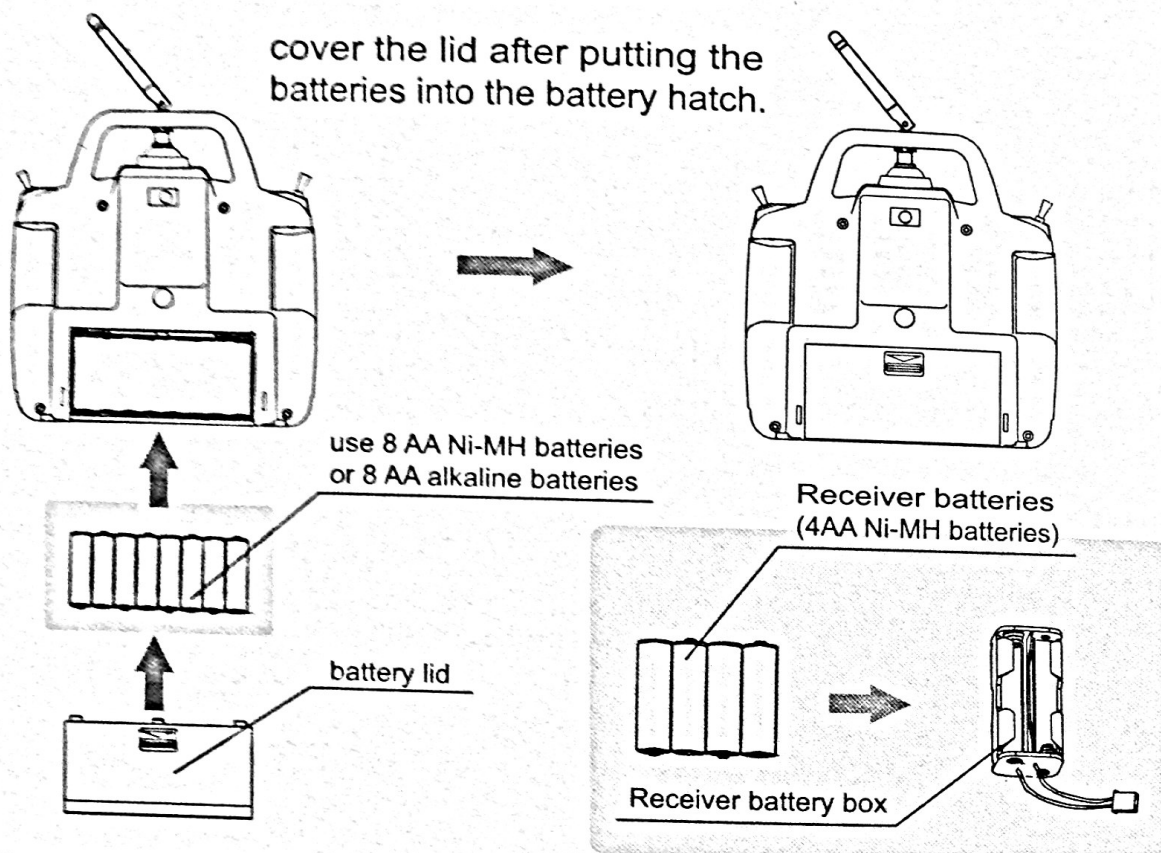
6.METHODS OF FREQUENCY ADJUSTMENT



1. Under the condition of closing of transmitter and receiver's power, Press and hold on the frequency button of transmitter as well as turn on the power switch, the blue light is on. (Loosen the button after the light is on)
2. Then, Press the frequency button of receiver and holding in the same time, turn on the power of Receiver (the red LED light won't on). it will finish the frequency adjustment in 3 seconds. the red LED light means the frequency adjustment failed, please turn off the power of the receiver and re-operate the 2nd step. (Note: this button is mini-button, please keep sure the button be pressed down, or else the frequency adjustment can not be finished successfully.)

3. Turn off the power of Transmitter and Receiver.
4. Restart the power of Transmitter and Receiver, a few moments later, the blue LED light keeps on, as well as the red LED light, it indicates the frequency adjustment is successful, and you can go into the normal R/C operation.

7. BATTERY INSTALLATION



When install the battery, please don't mix using the old and new batteries, also don't mix different types of batteries.

8. NOTICE

Charging the battery of transmitter

