

Bugs Series Brushless Drone with GPS

User Manual













GPS Positioning

One key return

Two direction 2.4GHZ



Brushless motor



Independent ESC (automatic lock protection, high temperature lock protection)



1080P Camera



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Important Statement And Safety Guidelines

Thank you for purchasing MJX product. Please read this manual carefully before use and retain it for future reference

Important Statement

- This aircraft is not a toy, but hobby grade model. It should be assembled and operated properly. Pilot
 must operate this hobby model in safe way. Improper operation may cuase injury or property damage.
- This aircraft is applicable for pilots aged 14+ who are with skilled flying experience.
- Users are in full charge of proper operating this aircraft. Manufacturer and dealers disclaim any
 responsibity for damages caused by misuse.
- Keep the small accessories away from kids to avoid accident.

Flight Safety Guidelines

Hobby grade radio control aircraft is somewhat considered to be the highest danger potential article. Users should firmly uphold the principle of "safety comes first". Never fly the aircraft near airports, above crowds or in zones storing dangerous goods and understand the responsibility of the accident may cause by improper operations.

· Stay away from obstacles, crowds, power lines, trees or waters

Always choose a wide open area for every flight, well away from people and property. Never fly directly over people or animals. Please don't fly in such bad weather conditions as high temperature, snow, strong wind(≥level 5), rain or fog. Maintain a 7ft (2m) distance from the aircraft when taking off and landing.

Keep the aircraft in dry environment

The aircraft is composed by sophisticated electronic components and mechanical parts. To avoid damages on the mechanical and electronic components, please keep the aircraft in dry environment and use clean cloth to wipe the surface and keep it clean.

· Practice flying together with skillful pilot

Beginners are suggested to practice flying together with skillful pilot's guidance. Do not fly alone.

. Bear proper operation and safe flight guidelines in mind

Please take a careful look at the manuals before flights for important information of product functions and operation tips, and learn how to use the accessory, safe flight always comes first. Stay informed of and abide strictly by relevant local laws and regulations. Keep away from any non-flight zones and respect other people's privacy.

Safe flying

Please make sure you are in good shape mentally before every flight. Fly the aircraft as per your flying experience. Never fly under influence of alcohol or drugs. Keep the remote controller at least 20 cm away from your body when flying the aircraft.

Keep distance from a flying aircraft

Never use your hands to touch a flying aircraft under any circumstance. Don't approach and touch a landed aircraft before its propellers are completely locked.

Keep away from heat source

The aircraft is made of metal, fiber, plastic, electronic component and other material. Please keep it away from the heat source to avoid deformation or even damage caused by sun exposure and high temperature.

• Environmental protection requirements

To protect our blue planet, so please recycle the aircraft as per local laws and regulations.

Product Profile

Product Configuration

Product/spare parts included in the box

Aircraft X1 Remote controller X1 Battery X1 Charger X1

Propeller changing tool X1 Caed reader X1 TF memory card X1 Screwdriver X1

Extra Propellers A/B X2

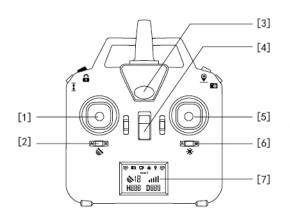
Technical parameter of the aircraft

Diagonal: 310mm Overall height: 75mm Aircraft weight(included battery): about 440g

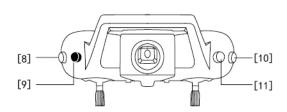
Brushless motor: 1806 KV1800 Battery: 7.4V1800 mAh Li-polymer Charging Time:about 5 hours

Maximum flying time: about 16.5 minutes

Major Parts Of The Remote Controller

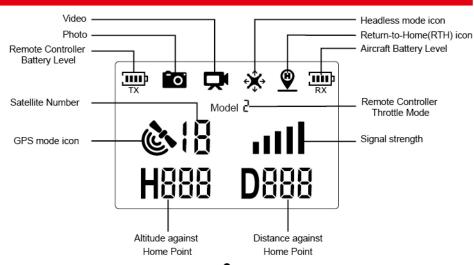


- [1] Left stick
- [2] Gesture/ GPS mode Switch
- [3] Power indicator
- [4] Power switch
- [5] Right stick
- [6] Headless mode Switch
- [7] LCD Display



- [8] Return-to-Home(RTH)/One key landing
- [9] Unlock
- [10] Photo/Video
- [11] Enter/Exit Return-to-Home

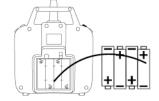
LCD Screen



How To Install The Battery Of Remote Controller

Unscrew counter clockwise to open the battery compartment cover, install 4x AA batteries into the battery compartment according to the given polarity, screw clockwise to close the battery compartment.





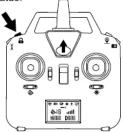




- Insert batteries with correct polarity.
- Non rechargeable batteries are not to be charged; the transmitter need 4 X AA batteries for work.
- •Do not mix old and new batteries.
- •Do not mix alkaline, standard(carbon-zinc), or rechargeable(nickel-cadmium) batteries.
- •Rechargeable batteries are to be removed from the toy before being charged;
- •Rechargeable batteries are only to be charged under adult supervision;
- Exhausted batteries are to be removed from the toy;
- The supply terminals are not to be short-circuited.

Remote Controller Signal Connection

Press the red button on top of the remote controller and turn on the power of the remote controller. The remote controller will send out 2 beep sounds, and the indicator lights keep flashing, the remote controller is under signal connection status.





Attention: When the remote controller is under signal connection status, please keep your hands away from the remote controller. If any operation is done, the remote controller will exit signal connection that will result in signal connection failure.

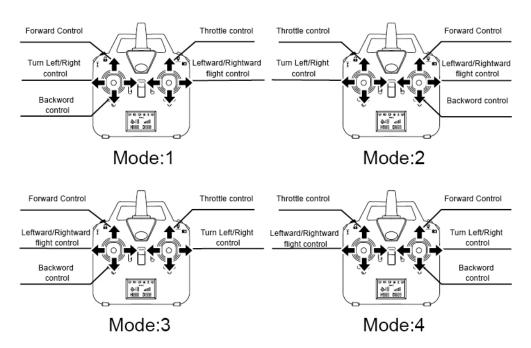
Throttle Mode Switch

Left hand throttle and right hand throttle are available for option at the remote controller. User can choose different control stick mode as per operation habit. There are 4 stick modes that could be found as below:



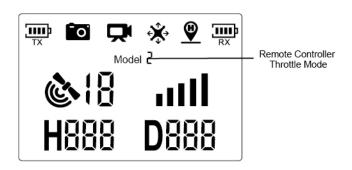
Attention: To change the stick mode of the remote controller, please make sure that your aircraft is under signal connection status(the indicator light keep flashing). If not, the stick mode could not be changed.

Stick Mode



How To Change Throttle Mode

When the remote controller is under signal connection status, long-press the RTH button for 3 seconds to choose the throttle control mode. The throttle control mode will change according to each press. The mode number is shown on the LCD screen. The throttle control mode is set by mode 2 by default.



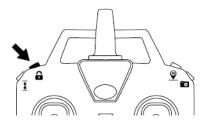
Control Stick Calibration

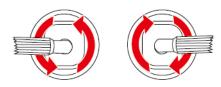
Warm tips:

Control sticks calibration has been completed by default. It is not necessary to calibrate the control stick unless pilot has felt unnormal stick travel.

How to calibrate the control sticks

Keep pressing the red button on top of the controller and slide the power switch to the ON position. Push down the calibration button and hold on for 3 seconds. The remote controller will send out 3 beep sounds; the indicator light of the remote controller turns from flashing quickly to slowly. Maximum rotate both of the left and right control stick to any direction for 2 circles. Then, again, push down the calibration button and hold on for 3 seconds. The remote controller will send out3 beep sounds; the indicator light of the remote controller turns from flashing slowly to quickly, which means that control sticks calibration is completed.





(rotate for 2 circles at the same time)

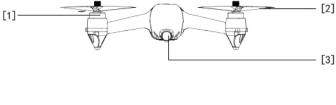


Attention: Please do not power on your aircraft when calibrate the control stick for the remote controller.

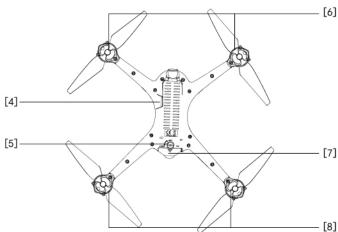
Remote Controller Status Indicator

NO.	Remote Controller Status	Operation
1	Indicator lights flash quickly.	The remote controller is under signal connection status.
2	Indicator lights flash slowly with steady beep beep sound and the battery legend " ()" on LCD display flashing.	The remote controller is in low voltage status.
3	Battery legend " on LCD display is as shown, with steady beepbeepbeep sound.	Battery is running out " ; the aircraft will return when the altitude is over 100m or the distance is over 300m.
4	Battery legend " "" on LCD display is as shown, with steady long beep sound.	Battery is low " xx the aircraft will return when the altitude is over 15m or the distance is over 15m, or land immediately.
5	Signal legend on LCD display is less than two grids or no displaying, with steady beep beep sound.	1.The distance between aircraft and remote controller is so long that the signal is weak. 2.The battery is removed nearly after the aircraft connects to the remote controller.

Major Parts Of the Aircraft



- [1] Brushless motor
- [2] Propeller
- [3] Camera



- [4] TF Card Slot
- [5] Knob
- [6] Front indicator light
- [7] Battery
- [8] Rear indicator light

How To Charge The Battery Of Aircraft

To cater different demands from end users, 3 charging devices are designed and optional for charging.

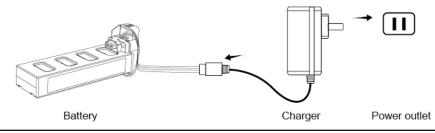
Charging device A: 1 X adaptor only;

Charging device B: 1 X USB cable and 1X balance charging controller; Charging device C: 1 X adaptor and 1 X balance charging controller.

Product will be packed with any of the 3 charging device. User should check the package to confirm which charging device is included before reading charging method.

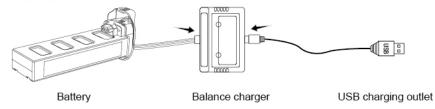
How to charge the battery with charging device A:

- 1. Insert the charger plug to the power outlet, the charger indicator turns green;
- Connect the triple-lines plug of the battery with the charger power line to charge the battery;
- The charger indicator keeps solid red when charging is proceeding and turns green once the battery is full-charged. Full Charging takes about 5 hours.



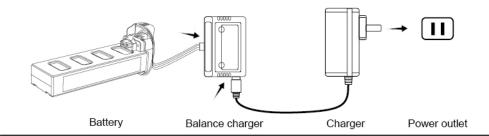
How to charge the battery with charging device B:

- 1.Connect the balance charger to any USB interface (5V adapter or any device with USB interface) by the USB cable. At this moment, the red light is solid on and the green light is off;
- Insert the triplex-wire plug of the battery into the triplex-wire socket of the balance charging controller and charging is proceeding;
- 3.The green light keeps flashing slowly and the red light keeps solid on when battery is being charged; when charging is finished, both of the green light and red light keep solid on. Once there is any malfunction, the red light will be solid on and green light will keepflashing rapidly. Full Charging takes about 5 hours.



How to charge the battery with charging device C:

- Connect the charger plug with power outlet; plug the charger wire into the socket located at the right side of the balance charging controller. At this moment, red light and green light are both solid on;
- Insert the triplex-wire plug of the battery into the triplex-wire socket of the balance charging controller and charging is proceeding;
- Green light is off and red light is on when the battery is being charged. Green light and red light will be both on once battery is full charged. Full Charging takes about 5 hours.





Attention: It is recommended to use the 5V 1-2A adapter for charging if charging by device B.



- Need adult supervision when this model is being played by children.
- •Only batteries of the same or equivalent type as recommended are to be used.
- Insert batteries with correct polarity.
- Non rechargeable batteries are not to be charged; the transmitter need 4 X AA batteries for work
- Do not mix old and new batteries.
- Do not mix alkaline, standard(carbon-zinc), or rechargeable(nickel-cadmium) batteries.
- Rechargeable batteries are to be removed from the toy before being charged.
- Rechargeable batteries are only to be charged under adult supervision.
- Exhausted batteries are to be removed from the toy.
- The supply terminals are not to be short-circuited.
- •The charing line to be used with the product should be regularly examined for potential hazard, such as damage to the cable or cord, plug, enclosure of other parts and that in the event of such damage, the product must not be used until that damage had been properly removed.

Product Assemble

Propellers installation/removal

How to install propeller A:

Put the propeller with marking 'A' into the clockwise rotating motor shaft (the side marked A should be upwards.) Then, put soft pad into the center bore of the propeller. Last, choose the propeller screw with dot and put it onto the motor shaft; tighten the screws by counter-clockwise.

How to install propeller B:

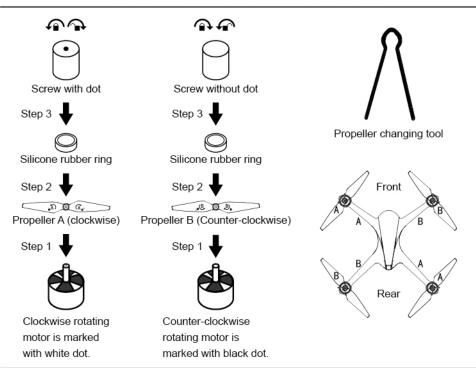
Put the propeller with marking 'B' into the clockwise rotating motor shaft (the side marked B should be upwards.) Then, put soft pad into the center bore of the propeller. Last, choose the propeller screw with dot and put it onto the motor shaft; tighten the screw by clockwise.

How to remove the propeller

Hold the aircraft brushless motor and unscrew the screw without dot by counter-clockwise (screw with dot should be rotated by clockwise) to take apart the propeller.



Attention: Please install all fittings step by step as below plctures. Keep in mind that the propellers are distinguished by A & B mark and propellers screws are distinguished by dot mark.please pay attention to your rotation direction.





- Please make sure that the clockwise and the counter clockwise propellers are installed
 on the correct motors, because the aircraft will not fly normally for wrong propellers
 installation.
- . Be careful when installing the propellers, as they are a little sharp.
- · Please use MJX propellers for this aircraft.
- · Extra propellers can be ordered additionally.

Battery installation

Slide the battery into the battery compartment at the rear of the aircraft by pushing with appropriate force. Make sure that you hear a click sound indicating the battery is firmly installed. At the moment, turn clockwise of the lock located at the bottom 90 degree to the "LOCK" position to double confirm that the







Attention: The battery should be installed firmly, failure to do so may affect the flight saftely of your aircraft. The aircraft may crash due to power-cut during the flight.

How to remove the battery

Turn counterclockwise of the lock located at the bottom 90 degree to the "UNLOCK" position; then, put your thumb and index finger on the designated position and press with appropriate force and pull backward. The battery will be removed. To avoid slipping, please keep your finger and your aircraft dry and clean

Aircraft Status Indicator

NO.	Indicator Status	Meanings
1	Front and rear lights flash light green rapidly	Aircraft 2.4GHz disconnected
2	Front and rear lights flash red, light green and green alternatively	Aircraft is in initialization detection status
3	Front light glows solid red, rear light glows solid light green	No GPS signal, aircraft is in gesture mode
4	Front light glows solid red, rear light glows solid green	Good GPS signal, aircraft is preparing for GPS mode
5	Front and rear lights flash green rapidly	Aircraft is in gyroscope calibration status
6	The light green indicator lights on the front and rear flashalternately	Aircraft is in Compass Horizontal Calibration
7	Front and rear lights flash green alternatively	Aircraft is in Compass Vertical Calibration
8	Front light glows solid red, rear light flashes red slowly	Aircraft is nearly low voltage, 1/4 battery level left.
9	Front light glows solid red, rear light flashes red rapidly	Aircraft is in low voltage, only 1/6 voltage left.
10	Front and rear lights flash once, stop for 1.5 second	Something wrong in gyroscope
11	Front and rear lights flash twice, stop for 1.5 second	Something wrong in barometer
12	Front and rear lights flash three times, stop for 1.5 second	Something wrong in compass
13	Front and rear lights flash fourth times, stop for 1.5 second	Something wrong in the GPS module

Link Your Aircraft To The Remote Controller

When the remote controller is in signal connection status, power on your aircraft. After a beep sound, signal icon util is shown on the LCD screen. It means that the aircraft has successfully linked to the remote controller.



- Signal connection is done once for all if the remote control is not linked to other aircraft.
- Set the connection one by one to avoid signal connection error.

Gyroscope Calibration

Set the aircraft on horizontal surface; push down both of the control sticks to the lower left corner (indicated as below photo). Once the front and rear lights are both green and flashing rapidly, it means that gyroscope is under calibration status. When the lights turn solid, calibration is succeeded.





- The gyroscope calibration has been done by factory default. Gyroscope calibration is no need to be performed unless the aircraft can not exit the aircraft initialization detection procedure while the aircraft initialization detection is finished.
- Please make sure to set the aircraft on horizontal surface when performing calibration, failure to do this will effect the flight.

Aircraft Initialization Detection

After signal connection, the aircraft enters into initialization detection procedure, with front and rear lights flashing red, light green and green alternatively. Make sure that the aircraft is set on a flat and still surface for the initialization detection. The Aircraft initialization detection takes about 8 seconds. Once front lights and the rear light glow light green and flash alternatively, initialization detection is done; the aircraft enters into compass calibration.



Attention: Make sure that the aircraft is set on a flat and still surface for the initialization detection. The Aircraft initialization detection takes about 8 seconds. Once front lights and the rear light glow light green and flash alternatively, initialization detection is done; the aircraft enters into compass calibration.

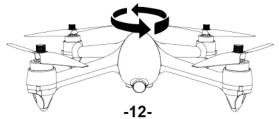
Aircraft Compass Calibration

- Aircraft compass calibration should be done for every flight. That is to say, if changing new battery or the battery is reinstalled, compass calibration should be done again.
- Compass calibration should be performed after successful aircraft initialization detection.

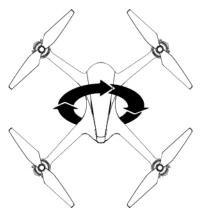
Two steps of compass calibration:

Step 1 Horizontal calibration

When the aircraft's front and rear lights flash light green alternatively, hold the aircraft upright and rotate it 360 degrees along the centeral axis for about 3 circles. The aircraft front and rear light will change from flashing light green alternatively to flashing green alternatively when complete.



Hold the aircraft with its camera facing down, and rotate it 360 degrees along its central axis for about 3 circles until the front light and rear light of the aircraft change from flashing to solid on. The compass calibration is successful.





Attention: To fly at GPS mode, please choose a open and wide space for the flight, and make sure that the satalite nubmer is more than 7.



- Please do not calibrate the compass in strong magnetic area, such as magnetic field, parking place or construction areas with underground reinforcement.
- Please do not carry magnetic materials with you (such as keys, cell phones, etc) when calibrate compass.
- Please keep away from big metal when calibrate compass.

How To Lock And Unlock The Aircraft

Unlock the aircraft:

There are 2 ways to unlock the aircraft that you can find it below:

- Short-press the red button(indicated as photo 1). The motors rotate and the aircraft is unlocked.
- Push the left stick to lower right corner and the right stick to the lower left corner at the same time (indicated as photo 2) to unlock the aircraft.

Lock the aircraft:

There are 2 ways to lock the aircraft that you can find it below:

- Pull down the throttle stick to the bottom position, long-press the red button (indicated as photo 1) for 3 seconds, the motor will stop immediately. The aircraft is locked.
- After the aircraft lands on the ground, pull down the throttle stick to the bottom position and keep for 3 seconds, the motor will stop immediately. The aircraft is locked.

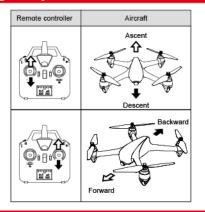


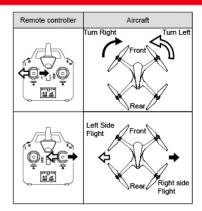
Photo 1



Photo 2

Flight operation



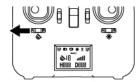


One-Key Takeoff/Landing

- After aircraft unlocked, short-press the button(indicated as below), the aircraft will automatically takeoff and hover at 1.5m altitude.
- When the aircraft is flying, short-press the button(indicated as below), the aircraft will automatically land on the ground.

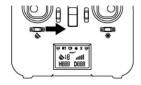
Flight Mode

Gesture Mode



Slide the button to position A, the aircraft is in gesture mode that GPS is not used for positioning, and the aircraft only uses its barometer to maintain altitude. The aircraft can not fly with precise positioning and hovering. Gesture mode requests pilot with good skill.

GPS Mode



In GPS mode, aircraft can precisely positon and hover by using the GPS module.

Headless Mode

In headless mode, before the aircraft takes off, you're required to position the aircraft in such a way that its front is your front. Then, when you take off the aircraft with the aircraft pointing in the front, you can give up worrying about orientation altogether.



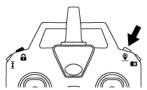
Return-To-Home(RTH)

The Return-to-Home(RTH) procedure brings the aircraft back to the last recorded Home Point. There are 3 types of RTH procedures: smart RTH, failsafe RTH and low battery RTH. The following sections describe them in detail.

	GPS	Description
Home Point	r s	The Home Point is the location at which the aircraft takes off. A strong GPS Signal must be presented for the aircraft to record the Home Point.

Smart RTH:

If the GPS signal is available(more than 7 satellites is presented) and the home point is recorded previously, press this button, the aircraft will fly back to the home point. During the smart RTH, you can use the remote controller to guide the aircraft around obstables. You can press the RTH button again to exit RTH procedure and regain the control of the aircraft.



Failsafe Return

If the GPS signal is available(more than 7 satellites is presented)) and the home point is recorded previously. Failsafe RTH will be triggered if the remote controller signal is lost for more than 6 seconds, the fly control system will control the aircraft automatically and the aircraft will fly back to the last recorded Home Point. You can regain control of the aircraft by press the RTH button if the remote controller signal is recovered.



- During the Failsafe Return procedure, the aircraft can not avoid obstacles.
- The aircraft cannot Return-to-Home if the GPS signal is weak(satellites number is less than 7).
- If there is no GPS signal and remote controller signal lost for more than 6 seconds, the aircraft will not Return-to-Home but descend slowly until land to the ground and lock the aircraft.

Low Voltage RTH

When the aircraft's rear lights flash red slowly, battery icon " : is shown on the LCD screen, and steady beep, beep sound is heard. At this moment, as long as the aircraft flying altitude is over 100 meters or the flying distance is over 300 meters, the aircraft will automatically fly back to the Home Point.

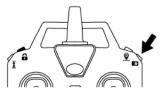
When the aircraft's rear lights flash red slowly, battery icon " \(\frac{1}{\text{sc}} \)" is shown on the LCD screen, and steady beep..., beep sound is heard. At this moment, as long as the aircraft flying altitude is over 15 meters or the flying distance is over 15 meters, the aircraft will automatically fly back to the Home Point. If the aircraft flying altitude is less than 15 meters or the flying distance is less than 15 meters, the aircraft will automatically land to the ground.



Attention: When aircraft is in low voltage RTH status you can not regain the control of the aircraft by pressing the RTH button.

Photo/Video

Short-press the button below phots shown and the camera icon on the LCD screen flashes once, it is taking photo.Long-press the same button, the video icon on the LCD screen flashes slowly, it is taking video. Long-press again to exit shooting.





Attention: When the aircraft is not inserted with TF card or the TF card is malfunction, photos and videos can not be taken and recorded.

Low Voltage Warning

- •When the battery icon $\frac{1}{800}$ is shown on the LCD screen, and the aircraft front lights glow solid on and the rear lights keep flashing slowly, it means that the battery is nearly low voltage.
- •When the battery icon is shown on the LCD screen, and the aircraft front lights glow solid on and the rear lights keep flashing rapidly, it means that the battery is in low voltage.





Photo 2

Signal Strength Indicator

Signal strength icon all shows the strength of the received signal. The more, the better.



Prepare The Flight

Before You Take Off, Check And Make Sure That

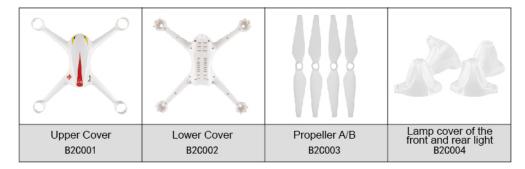
- 1. The aircraft and the remote controller are full charged.
- 2. The propellers are installed correctly.
- 3. The motors work normally after unlocking.

Flight Steps

- Link the remote controller with the aircraft.
- Aircraft initialization detection.
- Aircraft Compass Calibration.
- 4. Unlock the aircraft.
- 5.Pull upward the throttle stick and the aircraft takes off. Control the aircraft's flying gesture by the left and the right control stick.
- 6.Pull the throttle stick to bottom position and the aircraft lands to the ground and locks the motor automatically.
- 7. Take out the battery from battery comparment of the aircraft.

Product Components

Basic Parts





Trouble Shooting

NO.	Problem	Solution
1	The front and rear light green lights of the aircraft flash rapidly	The remote controller is not linked to the aircraft, and it requires completing the signal connection steps.
2	The front and rear lights of the aircraft flash red, light green andgreen alternately and not change	1.Check to see if the aircraft is in the stationary state. 2.Re-calibrate the gyroscope.
3	The front and rear light green indicator lights of the aircraft flash alternately	1.Take the compass level calibration steps. 2.The compass of the aircraft is broken, it is need to be replaced.
4	The front and rear green indicator lights of the aircraft flash alternately	1.Take the compass vertical calibration steps 2.The compass of the aircraft is broken, it is need to be replaced.
5	The aircraft fails to positioning	The GPS signal is weak, please fly in another wide place.
6	The return point of the aircraft is far away from the take-off point	1.The GPS signal is weak, please fly it in another wide place. 2.The aircraft can not receive satellite signal while taking off, fly the aircraft again when it receives signal from more seven satellites.
7	The aircraft fails to unlock	1.The battery of the aircraft is low, please replace the battery. 2.The aircraft is in initialization status, please re-calibrate the gyroscope.

Note:

- a) Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- b) 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.

