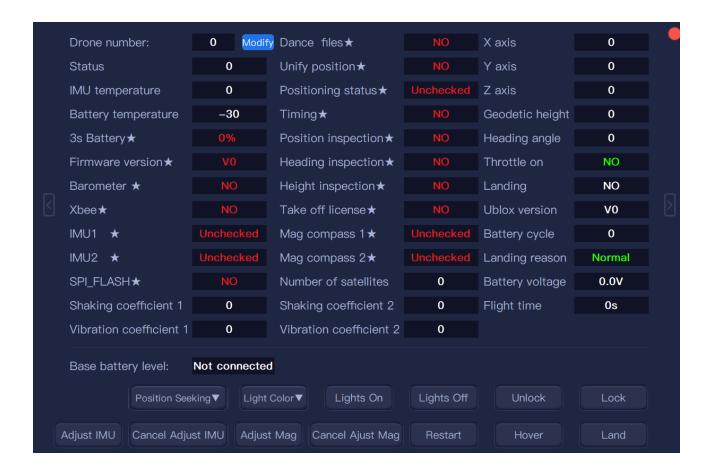


(3) View the status of a single drone

When abnormal drones are filtered out, we can click on a single drone using the mouse. When a certain drone is clicked with mouse, the drone light will flash orange and red, and the host computer will pop up the following information list:



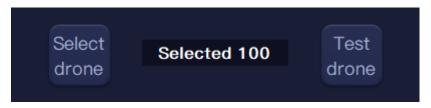


Normal status data font is displayed in green, and abnormal status font is displayed in red.

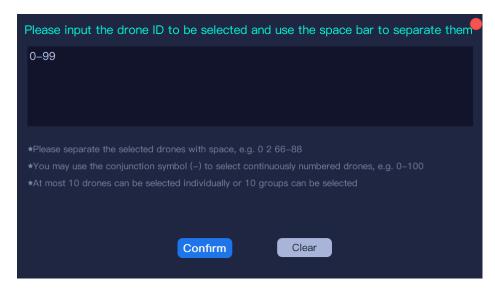
11. Initial drone Inspection (Hover Test)

This inspection mainly includes the condition of drone paddles, lighting conditions, magnetic interference and impact of satellite positioning environment.

(1) Click to select drone and enter the number.

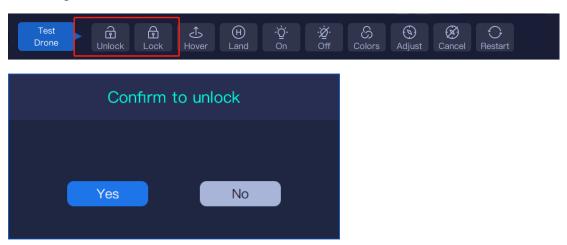






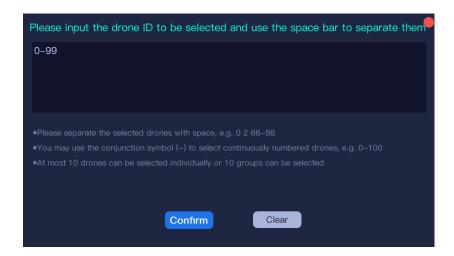
(2) Test the paddle

Select all drones; click to Test drone; click Unlock; then enter the field to check whether the paddles are rotating normally or in abnormal condition; after checking, click on the Lock.



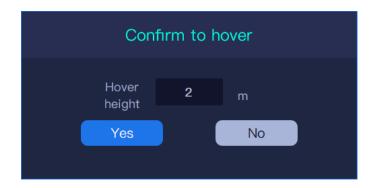
- (3) Select a part of drones for sequential testing (a group of 20 is recommended), conduct hovering test, check the flight status and the magnetic field interference and environmental impact at the same time.
- a. Select Drone





b. Click Hover and enter the height (two meters is recommended)





- c. After the drone takes off, check whether the drone is flying stably, whether the wind interference on the field is strong or weak, and check for spinning, shaking, positioning deviation, ups and downs, etc.
- d. Check all drones according to the above method.
- 12. Sync Timing
- (1) Click the Sync Timing button



(2) After successful Sync Timing, the drone frame will turn green, otherwise it will turn red. You can click on the drone to check whether the other status is



normal, and click Sync Timing again after ruling out other statuses.



13. Take-off Check

(1) Click Take-off Check.



(2) When the drone Status is selected, it means that the drone is ready for takeoff; if an error is displayed, click on the drone to check status failure and make corresponding changes.



(3) Click Cancel Check



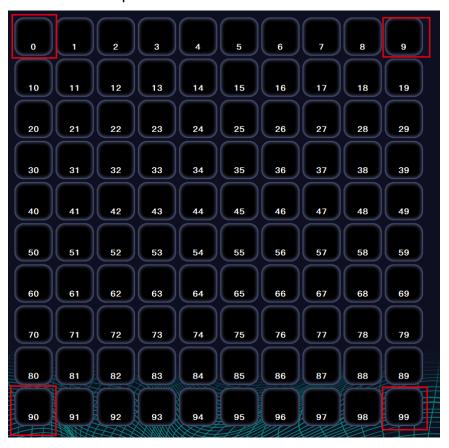
14. Second Flight Inspection (Test Flight)

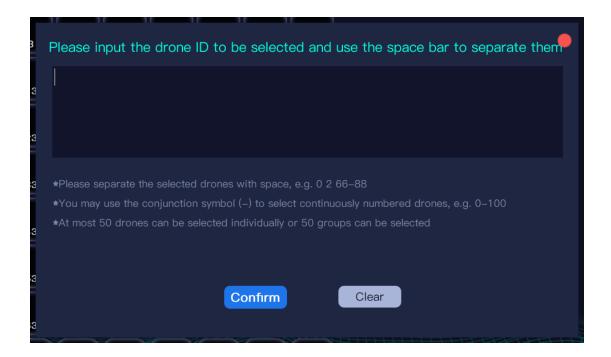
This inspection aims to check whether the flight dance steps are normal and whether the field condition is suitable.

(1) Choose the drones in the four corners of the dance step flight chart (as



shown in the figure, taking the 10*10 ,100 drone as an example, we can choose 0, 9, 90, 99. Actually, please refer to the corners of the maximum flight range of the dance steps)







(2) After selection, only these four drones will be displayed.



- (3) Then refer to the flight operation described in **15. Flight Operation**, and conduct test flight for the selected drones to check whether the flight is normal, whether the flight range is sufficient, and whether the dance step needs to be changed (please contact the sales staff for change when necessary).
- (4) After the drones have landed, select a row of drones (such as 0-9), repeat the operation to perform another flight inspection (for the purpose of optimum flight safety, this work should be done again as much as possible. In emergency, this work can be omitted appropriately, but step 3 must be performed).

15. Flight Operation

(1) Click the button Flight Operation



(2) Flight operation interface





(3) Prepare



After clicking "Prepare", the frame of the drones that have passed the self-check will turn blue, and it will prompt to count how many drones are ready and how many are not ready. Data statistics are calculated based on the number of drones in the dance step. Unprepared is the number of unprepared drones (including offline drones) within the current dance range. Prepared/unprepared does not include filler drones.

When ready to pass, the drone lights are forest green at this time. The UAV frame of the host computer is blue. If the battery has "Voltage unbalance" or "Power mutation", the UAV frame is cyan. The UAV system with abnormal battery is still allowed to take off. The user needs to fully understand the cause of the abnormal battery and replace the battery according to the actual situation on site.

(4) Take off

Click "Take Off" and the drone will start to take off and follow the dance steps to start the flight show. If there is a take-off countdown, the drone will take off on the ground according to the countdown, accompanied by the illuminated take-off countdown light in indigo, and the drone will take off. If, in the dance



step flight, a certain drone is set to low power landing, the drone will turn off the lights and land automatically when it reaches low power; in addition it will also turn off the lights and land automatically when it is positioned abnormally for more than 15 seconds. At the end of the flight performance, other droneS will automatically land normally according to the planned path and time of the dance steps.

(5) **Land**

Click "Land" to send a landing instruction to all drones which will directly land vertically without avoiding collisions. Please use it with caution during performance. Do not use unless necessary

(6) Pause, Continue, Backward Return and Return

Pause, Continue, Backward Return and Return can be enabled only when Xbee repeater is connected, and it is recommended to connect it before the performance.

After clicking "Pause", the drone will hover in the current space position after receiving the instruction.

After clicking "Continue", the drone in the paused state will continue to dance step when receiving the instruction.

After clicking "Backward Return", the drone will go back to home according to the original take-off dance path, and avoid collision. When using the function, pay attention to whether the battery power of the drones is sufficient to support the operation.

After clicking "return", all drones stop the dance performances, and the drones return to the sky above the take-off point from their current flying position and maintain the current altitude, and then make an overall landing. In the process of returning home, the drone cannot avoid collisions in the air. This function is only used in emergency situations. For example, the communication of the base station is abnormal and the drone exits the FIX working state and can only work in the GPS state. Using this function can prevent the drone from landing on the water or other places where landing is not allowed.

A

🖺 💥 Be cautious when using Land ,Backward Retrun and Return function.



Once the drone receives the relevant instructions, the instructions cannot be canceled until all the drones have landed. 'Backward retrun and Return are two different functions, pay attention to distinguish.

.....

- 16. Overall drone Test (Rehearsal)
- (1) After no problem is confirmed after conducting the 14. Second Flight Inspection;
- (2) Select all drones
- (3) Operate according to the above procedures, reload the dance steps, Sycn Timing, and Tack off cheack
- (4) All drones will fly for rehearsal according to the dance step
- (5) Wait for the drones to land after completing the flight.

A

During the rehearsal flight, pay attention to check whether the dance steps have reached the expected effect, and whether there is any unfavorable impact on the flight. In case of any unexpected conditions, please keep the flight log and analyze the reasons for the engineer before the formal flight performance.

17. Official Flight Performance

- (1) After the test flight is over
- (2) Reposition all drones, replace batteries with new ones, and turn them on
- (3) Reload dance steps, display filtering, Sycn Timing, Tack Off Check
- (4) Perform 15. Flight Operation;
- (5) Flight emergency handling.
- (6) Wait for all the drones to land, count the drones and arrange the equipment.

Fill of absent drone:

If some drones cannot take off normally due to various states that fail to meet the take-off conditions, we can use the fill of absent drone function (prerequisite for this function: the supplementary dance steps have to be designed in



advance before designing dance steps, and the supplementary drones must be positioned in advance, The minimum height of the dance step when filling the position should be \geq 10m). After reaching the repositioning nodes, the system will pop up the following dialog box automatically, and the user may choose to reposition or not. After the repositioning is completed, click "Continue" in the "Flight Operation".



The list of missing drone is displayed as the drone that is automatically judged by the system. In this case, it means that the drone is online; the list of offline drone displays the drone that has been offline before the ground takes off (referring to not being able to connect to the server). If the drone is disconnected due to the bombing and other reasons after the drone lifts off the ground, the system cannot identify whether it is absent. At this time, you need to manually add it to the offline drone list. If the drone is still online after the drone blows up, the system can still automatically Recognized in the list of missing positions.



** drone replenishment will consume a certain amount of flight time. The replenishment time depends on the number of missing drone and the size of the dance steps. It usually takes 2-5 minutes. During the flight show, please use this function according to the actual situation.

Emergency landing of batches of drones:

In the event of a sudden force majeure during the flight show, please perform the flight operation immediately. The best way to deal with such cases is to 'Pause' and 'Backward Return'. If it is impossible to satisfy the above two conditions, you can only land the drones directly or 'Return'which is the last resort.

Base station communication state

When the communication status icon of the base station is normal, it will display green; when the communication failure time is greater than 5 seconds, it will display red. If the drone is flying in the sky, the following prompt will be displayed:



When the above failure occurs, all drones will automatically turn off their lights and are in a hovering state. At this time, we need to check the base station immediately before deciding to perform subsequent flight operations. If you choose to continue flying, the drones lights will automatically turn on again. During the performance, if the base station communication is restored, the host will give a prompt:



Prompt

The current base station communication is normal!

When there is a communication failure in the base station during the flight show, we should first check the base station antenna and other related connections. If the connection is no problem, please try to restart the base station. About 50 seconds after the communication of the base station is disconnected, the drone is still positioned in the Fix state and can perform normal flight performances. After about 50 seconds, the drone will exit the FIX state. If the communication can be quickly restored within 50 seconds, it will not affect the entire flight show. At this time, you can choose to continue the flight show or 'Backwrad Rertun'. Under normal circumstances, let the base station recover as much as possible before proceeding with subsequent operations. If the base station cannot be recovered, please choose to 'Return' or 'Land' according to the on-site situation.

* 'Backwrad Return' and 'Return' are two different functions, pay attention to distinguish.

Flight Monitoring:

During the flight, you can open the Skyshow software to monitor the flight. In case of an abnormality in the drone, you can perform related operations in time. For specific operations, please refer to IV. Operation of SkyShow 3D Simulation Flight System



4.4 Operation of SkyShow3D Simulation Flight System

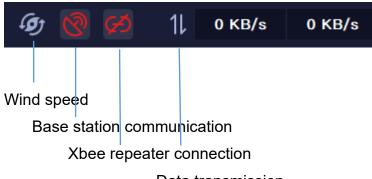
Software introduction:

SkyShow is the platform software used to simulate the flight status of drone formation and to play back historical records. The software supports simulating the flight dynamics on the computer to achieve real-time flight monitoring by utilizing the coordinate data transmitted from the drone in real time. In case of abnormality, the corresponding emergency flight operation can be done on the software. In addition, the software can also record and save the flight log of the entire dance step performance, which is convenient for subsequent analysis by R&D personnel.

Please refer to section 3.5.5 of this instruction for the operation and precautions of Skyshow3D flight simulation system

4.5 Equipment status. Host Computer Shortcut Keys and Software Configuration

 1. Wind speed assessment and communication status of equipment such as base stations



Data transmission

Wind speed state

*This function requires firmware above RIFF_03_20_028(beta2).RiFF

Wind Speed	state	Icon color
0-5.5m/s (level0-3)	normal	white
5.6-7.9m/s (level4)	note	yellow
8-10.7m/s (level5)	alarm	orange



10.8-13.8m/s (level6)	limit	6 red
≥13.8m/s (level7 or above)	Danger	red red



- $oldsymbol{\Delta}$. The wind speed warning is calculated based on the flight attitude, which is for reference only. Please be cautious when flying above 7.9m/s!
 - Ж When the host computer prompts that the wind speed level reaches the standard of wind speed 6, the console operator must immediately suspend or terminate the performance.
 - Ж When the wind speed exceeds the level 6 wind standard, please pay attention to safety. The drone will lose control and the system will automatically start the return procedure.

2. Shortcut keys on the main interface of host computer, as shown in the figure below.

Ctrl+ Left button (click the drone frame to select multiple drones; the selected drones are all lit with orange lights, And you can directly perform the "test drone" function operation on the selected drone)

Ctrl+A (restore the original status light of the drone)

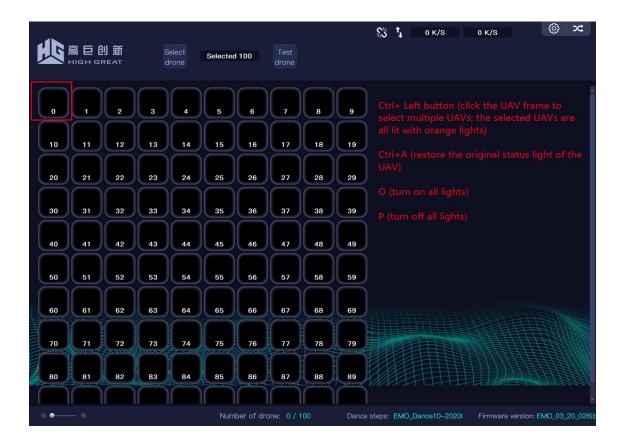
Alt+ scroll wheel (Zoom in/out of the drone box)

U (Quickly open the USB flash settings interface)

O (turn on all lights)

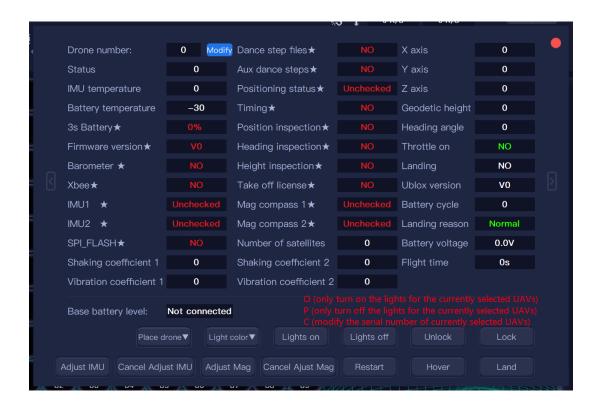
P (turn off all lights)





- 3. The shortcut keys in the detailed interface of the single drone are shown in the figure below.
 - O (only turn on the lights for the currently selected drones)
 - P (only turn off the lights for the currently selected drones)
 - C (modify the serial number of currently selected drones)
 - F5(When WIFI is offline, heartbeat packet data is transmitted back through Xbee radio)





4. In case of abnormal landing, modify the software configuration parameters and choose to land with the lights off or on.

The path is in the installation folder, find a configuration file of config.ini, and double-click to open it;

Find OpenLightDown, and when OpenLightDown=0, abnormal landing will occur and the light is not turned on; when OpenLightDown=1, abnormal landing will occur and the light is turned on; after modification, save it, and then restart the host computer to take effect.



4.6Description of drone Light Status

Please read 1.1.4 drone calibration and lamp signal in this instruction for the description of light language status during formation performance

4.7Precautions for Use (mandatory)

- 1. Determine the viewing direction of the audience, and communicate well in advance how the drones should be placed in the dance step design.
- 2. Before each take-off, check whether the appearance of the drone (protective cover, buckle) is normal, whether the arms and screws are loose.
- 3. Install the battery in place with a little force (battery buckle and battery compartment are clamped). However, do not install or throw the battery violently.
- 4. Unlock it once before takeoff, arrange for a person to, row by row or line by line, check whether the motor of each drone rotates abnormally, and lock it after they are confirmed ok.
- 5. Using the selection function, all drones will hover 1-2 times in two batches in alternate rows (at the defined height) to ensure that each drone can work normally. In case of take-off abnormality or obviously shaking, jittering or fluctuation during hovering, it is required to verify the drone repeatedly, and if any, mark it and return to the factory for repair.
- 6. In the dance step test, first test fly a few drones (preferably corner drone) to ensure that the dance step is ok.
- 7. When necessary, arrange for person to take video when taking off. Pay close attention to the flight. In case of landing abnormality, the operator shall know the landing location, the number of drones displayed on the host computer and the power supply information, ensuring that it is ok.



- 8. The abnormal situation should be recorded truthfully and the abnormal drones are well marked. If necessary, the log (both the drone log and rtk log) after the landing of the abnormal drone should be sent to the relevant personnel of HIGH GREAT for cause analysis and investigation.
- 9. If it is difficult to close the lid of the transport box, please do not close the lid forcefully. The drones should be placed in the transport box in order of direction. The nose and tail need to be paired and placed. Incorrect placement will cause excessive height, and difficulty in closing the transport box. Do not squeeze and close the lid by force. Closing the cover by force will cause the protective cover to deform.
- 10. In case of rain or dew during the flight, after landing, wipe the rainwater when the drone is placed horizontally (and to prevent rainwater from pouring in from the side of drone, do not put the drone sidelong). The drone can be put into the transport box by the side only when it is wiped dry.
- 11. When charging the battery, it is necessary to fully evaluate the load capacity of the power supply, otherwise it may cause trip or burn out the power strip. At present, the maximum power of battery charging box is 1,980w, and a household socket is usually 220V 10A, and therefore in this case, one power strip can only be connected to one charging box, and cannot be connected to two or more charging boxes.
- 12. The laptop needs to be set to never sleep (if the computer sleeps, it will cause the drone to exit the server).
- 13. In case of a high wind speed \geq level 5 (>7.9m/s), it is recommended not to fly drones.
- 14. Please note that the protective cover of drone is fragile when placing and receiving the drones. Please hold the fuselage of drone and avoid holding the protective cover.



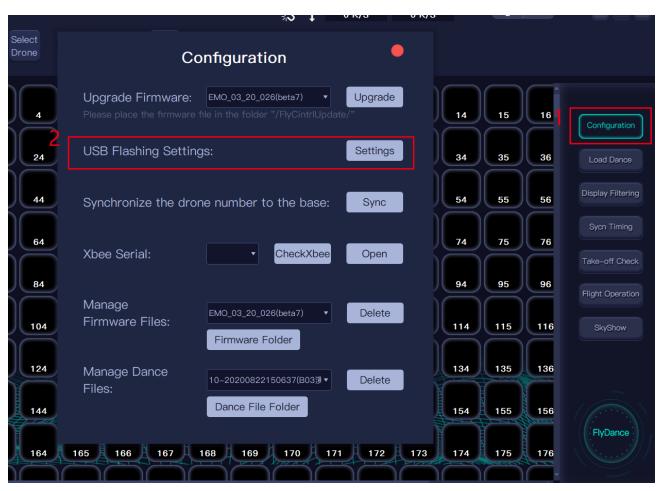
- 15. Be careful not to take off on sandy ground. In case of sandy ground, please lay dust cloth on the ground. Since the motor is exposed, once sand enters the motor, it will easily cause bearing damage. After the flight show, clean the motor with high-pressure air gun in time.
- 16. The drone needs to be handled with care during transportation, placed flat and stable, and cannot be moved violently.
- 17. When the computer needs to be connected to RIFF through USB, please be sure to use the data cable dedicated to RIFF, otherwise it may damage your computer.
- 18. When using a USB HUB, please pay attention to the load capacity of the USB HUB. For example, when connecting multiple peripherals (such as Xbee repeaters, remote control receivers, etc.), you need to supply an external power supply to the USB HUB to avoid connection failure due to insufficient power supply.

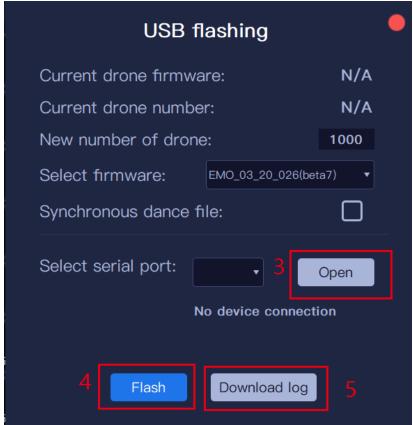


4.8Common Problems and Solutions

- 1. The drone numbering is unsuccessful, possibly due to the following reasons:
- (1) The drones are not placed neatly, and positioned in disorder (using a ruler)
- (2) The drones fail to enter the FIX state
- (3) The drones are not placed in accordance with the dance steps
- (4) After placement, the dance steps are numbered without choosing
- (5) There are multiple 0\$ drones, and there are multiple pile cranes (make sure there is only one 0# drone and one positioning drone)
- (6) Power on the drones beyond the number of dance steps. (For example, 100 dance steps, 110 airdrones are powered on)
- (7) There is a problem with the dance steps, you can change the number of dance steps with the same spacing to determine whether there is a problem with the dance steps.
- 2. If the drone turns or has a large heading angle deviation, you can try to recalibrate the magnetic field. Please refer to the "RIFF drone Manual" for the method of magnetic field calibration
- 3. If the severe impact and crash has caused the change to the zero offset of IMU or the host computer prompts that the IMU is not ok, you can try to recalibrate the IMU. For the calibration method, please refer to the "RIFF drone Manual".
- 4. If the drone fails, the R&D personnel should export the flight log for analysis(1) Log download









(2) Download drone log and if the log downloading is quite slow, you can click Download the Log again.



(3) Download RTK log and if the log downloading is quite slow, you can click Download the Log again.





5.Disclaimer

Thank you for purchasing the products of Shenzhen HighGreat Innovation Technology Development Co., Ltd. (hereinafter referred to as "HighGreat"). This product is a specially controlled item, and it is forbidden for minors under the age of 18 to use it. For your better use of this product and your safety, please read this disclaimer carefully before use. Once this product is used, it will be regarded as recognition and acceptance of all contents of this statement!

This product is a kind of drone developed by HighGreat and specially designed for formation performance, supporting outdoor flight within the scope of law and safety. It is necessary to fully understand local laws and regulations before flying. In the process of using products and supporting software, users promise to be responsible for their actions and all the consequences arising therefrom. The user promises to use the product and supporting software only for legitimate purposes, and agrees to abide by these terms and any relevant policies or guidelines that may be formulated by HighGreat.

High Great reserves the right to update this disclaimer. To obtain the latest disclaimer, please visit http://www.hg-fly.com, the official website of High Great. Any updates may be made without prior notice.

The disclaimers may have slight differences between versions in different languages. The Chinese version shall prevail, while other language versions are for reference only.

The final interpretation right of this disclaimer belongs to Shenzhen HighGreat Innovation Technology Development Co., Ltd.



6. Exclusion clauses

In case of direct or indirect personal injury or property loss caused by the following reasons when using this product, HighGreat will not be liable for compensation and legal liability.

- 1.Failure to read the user manual carefully, failure to comply with the use training of Gaoju Innovation, and failure to carry out all arrangements and operations in accordance with the instructions therein
- 2. Operation by the an operator who is under poor physical conditions or poor mental conditions such as drinking, drug abuse, drug anesthesia, head ache, fatigue and nausea.
- 3. Any compensation for mental damage caused by the accident.
- 4. Improper maintenance, unauthorized disassembly, maintenance and modification, or replacement of parts that are not provided by HighGreat.
- 5. Unauthorized modifying codes of the supporting APP or drone software.
- 6. Flying in strong interference areas such as magnetic field interference area and radio interference area.
- 7. Flying at high altitude, rain and snow, extremely cold weather and other inappropriate weather.
- 8. Flying in no-fly zones, public safety places, above crowds or dangerous areas, and other prohibited areas.
- 9. Operator's operation error or subjective judgment error.
- 10. Improper storage, such as being subjected to strong impact or extrusion, or being placed in an inappropriate environment (e.g. water ingress, fire).
- 11. Cuts and scrapes of the users due to improper use of the propeller in static or flying state.
- 12. Battery damage due to improper use, or unable to work normally due to contact with sharp objects or external force.
- 13. Equipment damage caused by user's improper operation.
- 14. drone or other article damages due to squeezing or external force during carrying.
- 15. There are obvious signs or prompts indicating that the drone or battery is



abnormal, however, the operator fails to check before flight or fails to notice during flight, resulting in the abnormality not being discovered, or the abnormality has been discovered but continues to be used.

- 16. Bad operation of the drone itself caused by natural wear, corrosion and aging of lines.
- 17. Damages caused by infringement of any data, audio or video data obtained by the operator using the drone and supporting software.
- 18. Any indirect losses and legal liabilities caused by equipment, accessories or software problems.
- 19. The operator fails to comply with local laws and regulations.
- 20. Other damages that do not fall within the scope of HighGreat's responsibility.
- 21. After content iteration of software, the latest electronic operation guidelines shall prevail, and the updated related content may not be notified.



7.Warning

1. FCC 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.

To assure continued compliance, any changes or modifications not expressly approved by the party.

Responsible for compliance could void the user's authority to operate this equipment. (Example- use only shielded interface cables when connecting to computer or peripheral devices).

This equipment 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.

FCC Radiation Exposure Statement:

The equipment complies with FCC Radiation exposure limits set forth for



uncontrolled environment. This equipment should be installed and operated with

minimum distance 20cm between the radiator and your body

- 2. Make sure to use special batteries and charging equipment provided by HighGreat, otherwise there may be explosion danger. Also, please correctly dispose of the used battery according to the instructions. The Type-C port of the device can only be connected with devices with specified communication port, and it is forbidden to connect it to some other devices.
- 3. Keep the drone in line of sight for control when flying. When you need to touch the drone with your hands or other objects, pay special attention not to touch the propeller. In addition to the above, it is necessary to ensure that the drone always keeps a certain distance from people, obstacles and water surface.
- 4. It is recommended that customers conduct test flight before the flight show. When conducting test flight, full evaluation shall be made on whether the flight environment is available. HighGreat does not assume any responsibility for the loss of personnel or goods that are not caused by product quality problems.
- 5. The battery may be at a high temperature after use, and immediate contact may cause burns. Please do not contact it directly. HighGreat does not assume any responsibility for burns and scratches caused by not using according to the instructions.
- 6. Make sure you have a clear understanding of the types of flight activities (such as entertainment, public affairs or business). Be sure to obtain the permit issued by the relevant department before flying. If necessary, local legal workers may be consulted for a detailed definition of flight activity categories. Note that in some regions and countries, it is forbidden to use drone for any form of commercial activities.
- 7. Do not use this product for the following activities (including but not limited to):
- Defamation, harassment, abuse, threat, stalking, or otherwise infringing upon the legitimate rights of others, such as the right to privacy and publicity.
- Used for any undesirable or illegal purposes, such as unauthorized investigation and investigation, espionage, military activities, etc.



• Violating any laws, administrative regulations, public order and good customs in the region where the products are used.

The copyrights of this product and manual belong to HighGreat. No organization or individual may copy, reproduce or publish it in any form without written permission. If it is quoted or published, the source shall be indicated, and it shall not be quoted, abridged or modified in a way contrary to the original intention of the manual.

To learn more about this product, please visit the following website:

www.hg-fly.com



Appendix

Appendix I: Warranty Card

Purchase Inform	ation		
Serial No.		Purchase Date	
Dealer		Telephone	
Address			
User Name		Telephone	
Address			
Maintenance Reco	ords		
Repair Date	ate Fault and Repair Conditions		

If the product and equipment are damaged by non-human reasons, the warranty is one year (battery for half a year)

In need of maintenance service, please contact your dealer, or contact HIGHGREAT customer service in the following ways:



Manufacture: Shenzhen HighGreat Innovation Technology Development Co., Ltd.

Address: 2/F, Building 6, Yuanlingzi Industrial Zone, Hengping Road, Yuanshan Street, Longgang District, Shenzhen

E-mail:

TEL:400-888-9686



WeChat official account



Official website



Appendix II: RIFF Battery Maintenance Record Form

Maintence item Time	Number of batteries maintained (activated once every 3 months when it is not in use as per the method described in Article 1.3.5 of this article)	Total number of batteries during maintenance	Signature of executive

Appendix III: RIFF Drone Accessories Maintenance Record Form

Maintenance item Time	Number of paddles replaced	Number of snap rings replaced	Number of protective covers replaced	Number of loose arms	Total number of drones during maintenance	Signature of executive

Remarks: In case that damaged paddles, detached snap rings, broken protective covers and loose arms are found during the execution of tasks, they shall be replaced in time or returned to the factory for maintenance (loose arms).