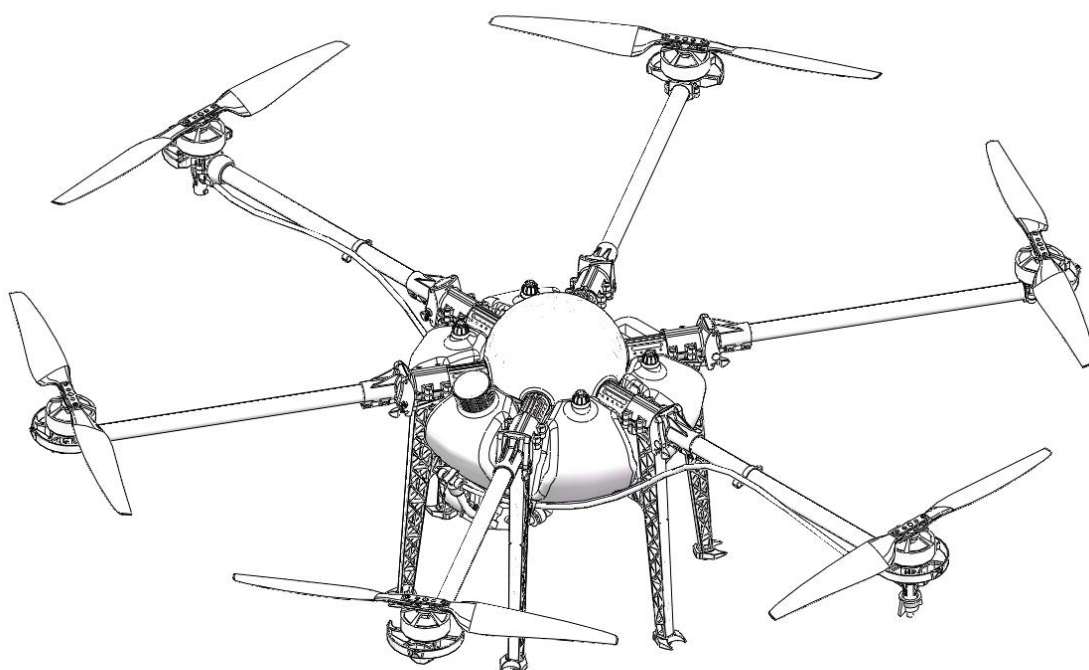
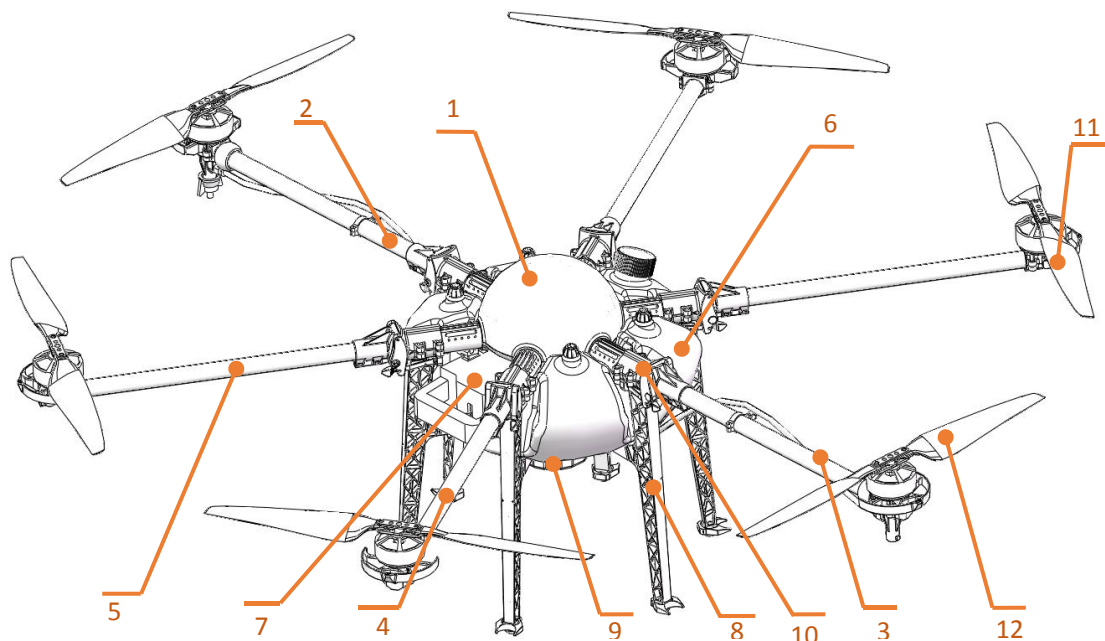


TIANNONG M6E-1 Mist Device USER INSTRUCTIONS



Beijing TT Aviation Technology Co., Ltd.

Make sure the pilot is well-trained in operating UAVs before going on mission.



TIANNONG M6E-1 Structure Picture

Item	Component	Item	Component
1	Fuselage	7	Intelligent Battery
2	Clockwise Arm with LED	8	Landing Gear
3	Counter Clockwise Arm with LED	9	Functional Tank Lid
4	Clockwise Arm	10	Arm Joint(Fuselage)
5	Counter Clockwise Arm	11	Propeller (clockwise)
6	Water Tank	12	Propeller (Counter clockwise)

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1.Use Instruction

1.1 Safety Instruction

- ◆ The product is not suitable for the ones who are less than eighteen or who do not have full capacity for civil conduct.
- ◆ The product have bigger fuselage size, high speed rotary and strong flight dynamics. At runtime have a certain dangerousness . Not in accordance with the requirement operation and usage will cause to potential danger and hurt.
- ◆ When using this product, please keep away from airport, railroad, high speed road, high buildings ,electric wire and other dangerous environments.
- ◆ When using this product, please keep away from mobile phone base stations, high power transmitting equipment, and other high electromagnetic interference environments.
- ◆ When using this product, please keep away from army and kinds of manned craft flight area.
- ◆ Don't use this product in rain, thunder, sandstorm, fog snow ,high wind ,and low temperature and other bad environments.
- ◆ When flying in more than three kilometers. Environmental factors can lead to flight performance degradation, please care of using it.
- ◆ When operating this product fly in low sky .Please always keep UAV and people & animals in a safe distance of ten meters
- ◆ When using this product in desert area, please keep UAV within the range of operator's eyes
- ◆ Don't hover or fly over the crowd, Don't be delight in scaring others.
- ◆ When it is close to the crowd ,please land this UAV as soon as possible and guide people to keep and avoid potential accident.
- ◆ Don't operate it in the area of children playing.
- ◆ If not in the extreme necessary condition, please do not power off when flying in the air.

- ◆ You can not fly if you are in drinking, tired, drugs, physical discomfort, etc. .
- ◆ Please inspect it before using every time, including but not limited to parts of fastness, organism and propeller of cracks, and abrasion, battery, the effectiveness of light. When error happens, please stop using immediately and replace the corresponding parts.
- ◆ Abnormal working state of the UAV maybe happen accidentally, don't open the propellers and forcibly fly with wrong.
- ◆ Do not try to prevent the moving parts while working.

1.2 Pesticide Usage

- ◆ All pesticides are poisonous. Please be careful and work strictly according to the safety instructions of pesticides.
- ◆ When dispensing, please use clear water. If not, will cause jams mesh of impurities. If it is blocked, please clear it before reuse
- ◆ When dispensing, please note that liquid sparks and the pesticide residue in fuselage will be harmful to human body.
- ◆ When dispensing, please pay more attention and use protective tools, and do not let body directly touch with the pesticides; After pesticide spraying, please clear your skin, copter and remote control.
- ◆ When using pesticide, there will be interaction between different pesticides, user should clear cartridge or keep a certain interval time.
- ◆ Spraying shall be carried out in windless sunny day, don't spray under high temperature at noon. While breezing, the operator should be standing above the wind and spraying; do not work when wind is four.
- ◆ When spraying, if you feel uncomfortable, headache or dizzy, please leave the site at once and rest. If once severe symptoms occur, immediately be sent to hospital.
- ◆ Pesticide effect and the solution concentration, spray rate, copter high from crops, wind direction, wind speed and so on are close related. When using pesticide should consider the above factors, to achieve the best effect. Please make sure that do not damage the human beings and animals and surroundings during the process of

spraying.

- ◆ When using pesticide , do not pollute river and drinking water

1.3 Inspection

- ◆ Before flying, ensure the battery is enough
- ◆ Ensure all the parts are installed firmly, and all the screws are tight as required.
- ◆ Ensure all the wires are correctly linked.
- ◆ Ensure all parts goes well. If it is broken or aging, please replace timely.
- ◆ Before flying, carefully check the propellers installation direction 、 rotation direction, control and others.
- ◆ Ensure all the propellers are fine, no any scratch and tightly installed.
- ◆ Ensure the sprayer is fluent without any clogging and work normally.

1.4 Environment

- ◆ While flying, please ensure the drone away from the crowds, dangerous goods, high buildings, high-voltage wires and others. Please fly the drone in a dedicated space.
- ◆ Please ensure the drone fly within the operator's eyesight.
- ◆ The drone working temperature is between 0°C-40°C.
- ◆ Ensure the drone fly within the permit of local law and regulations.
- ◆ To fly the drone safely as required, please fly it within in the height of 50 meters. If it has local flying height limit within 50meters, please make sure obey the related regulations.

1.5 Operation

- ◆ Please ensure the multi-rotor drone flying height is within 8 meters, except the special requirements.
- ◆ Before remote control calibration 、 hardware update, parameter setup, please remove the propellers and avoid the potential moving suddenly.
- ◆ Remove the battery if it does not fly, to avoid flying it when touching the remote control once.
- ◆ Please remove the batteries once landing. Do not move the drone when it is in power.
- ◆ Do not touch the joy stick mistakenly, and prevent start the drone.

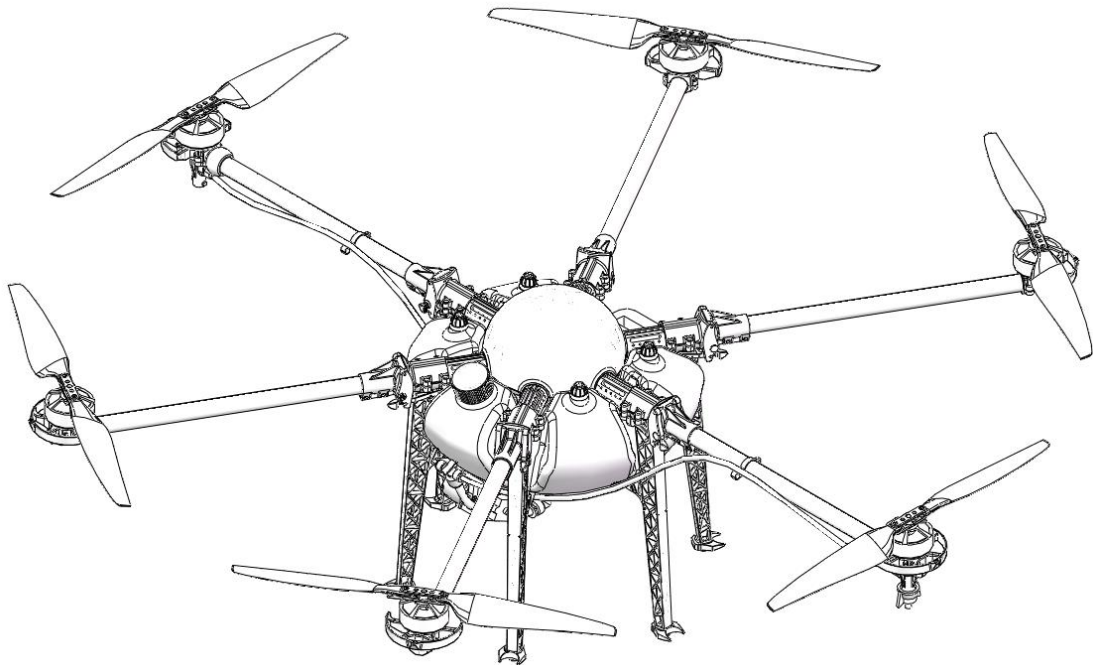
- ◆ When it is powered, please stand in the safe distance of above 10 meters.
- ◆ Ensure the propellers completely stop and power off.
- ◆ Please switch it to the manual operation mode when errors happen. When the manual operation mode does not work, please press the emergency bottom. Please keep away from the crowd.
- ◆ When the battery is damaged, please ensure it is stored in the disposal area and avoid spontaneous combustion. In order to protect environment, please don't throw batteries randomly. And consult the maker about the proper disposal method.
- ◆ During the flight, don't fly overload and do not cause any potential dangers.
- ◆ When low battery is warning, please return as soon as possible.
- ◆ Ensure that the remote control and battery is enough, to ensure that firmware has been updated to the latest version.
- ◆ Ensure flying sites outside of the restricted areas and is proper for flight . .
- ◆ Please make sure do not fly or operate the drone when you are drunk or with medicine limitation.
- ◆ Be familiar with the remote control operation & each flight mode, and ensure you know how to operate the control condition.
- ◆ User shall know and obey all the law and regulations in flying location.

1.6 Compass Calibration Requirements

- ◆ Compass has to be calibrated before using the first time. If else, it cannot work and will affect flying safety.
- ◆ Please do not calibrate it in the place close to the high-magnetic field or big metal materials, such as high-voltage, magnet, parking lot, concrete iron building, etc.
- ◆ When calibrating, please do not bring the magnetic materials, such keys and cellphone.
- ◆ If it is calibrated indoor, please do not re-calibrate it outdoor. It prevents that the two magnet differences cause the potential flying data errors.
- ◆ Magnetic field location is different, please make sure re-calibrate when it changes to the place from the previous one.

2. Product Introduction

TIANNONG M6E-1, the multi-rotor UAV, is the most economic integrated solution for all the agriculture spraying services. This UAV is waterproof and easy to repair, long-time flight with high-strength & light fuselage material. The big power brushless motor guarantees the sensitiveness and flexibility. The Lipo batteries guarantee the power supply and easy to repair and maintain. Various spraying tests proves the best performances of this UAV.



2.1 TIANNONG M6E-1 Parameter

Weight (without battery)	9KG	Max Pitch Angle	$\leq 35^{\circ}$
Standard Takeoff Weight	23KG	Best Spraying Speed	4--6m/s
Max Takeoff Weight	24KG	Max Spaying Speed	10m/s
Max Thrust-weight Ratio	2.25(Flying weight23Kg)	Working Time	6--12min/ flight

Battery	TTA Intelligent Battery(12S)	Max Climbing Speed	5m/s
Max Power	12000W	Max Landing speed	3m/s
Hovering Power	3100W	Max Flying Speed	15m/s
Hovering Time	Empty flight ≥25min Full flight ≥7min	Recommended Working Temperature	10-35C°
Hovering Accuracy	Horizontal ±1.0m Vertical ±0.5m	Max Anti-wind Strength	12m/s
Spraying Height	2--4m	Max Flying Altitude	3500m
Max rotation angle	360°	Best Storage Temperature	10-25C°

2.2 TIANNONG M6E-1 Agriculture UAV Specification

Frame		Diagonal Wheelbase	1290mm
		Arm Length	435mm
		Unfolded Height	465mm
		Folded Height	601mm
		Folded Width	400mm
		Sprayer Distance	1290mm
Power System	Motor	Motor Model	TTA6215
		Stator Size	62mm
		KV	160KV
		Max Thrust	9KG
		Max Power	2000W
		Weight	325g
	ESC	Max Continuous Working Current	50A
		Max Peek Current(3s)	100A
		Max Voltage	14S LiPo
		Working Voltage	12S(44--50.4v)
		Working Pulse Width	1000--2000us
		Compatible Signal Frequency	50--400Hz
		Drive PWM frequency	400Hz
	Foldable Propellers	Material	High strength engineering plastic
Diameter /Screw pitch		2388 (L=585mm)	
Weight		95g	
Battery	Capacity	14000MAh	

Spraying System	Tank	Rated Payload	10KG
	Sprayer	Model No.	Pressure Type (Sector)
		Quantity	2 pcs
		Sprayer Diameter	0.5-1.5mm
		Spraying Speed	4--6m/s
		Spraying Volume	1.8--2.2L/min
		Spraying Width	4-6m (up to height)
		Spraying Droplet Diameter	80--200µm (adjustable)
Remote Controller	Remote Controller	Model No.	R4
		Working Frequency	2.4Ghz
		Charging time	10h
		Effective Signal Distance	1.2KM
		Battery capacity	3.7V, 4000mAh
		Charging type	DC, 5V 2A
		Charging time	5-10h
		Working Environment Temperature	0--40C°
		Best Storage Temperature	10--25C°
		Best Charging temperature	10--25C°

2.3 Preparation Before Takeoff

2.3.1 Installation of Fuselage, water Tank & Landing Gear.

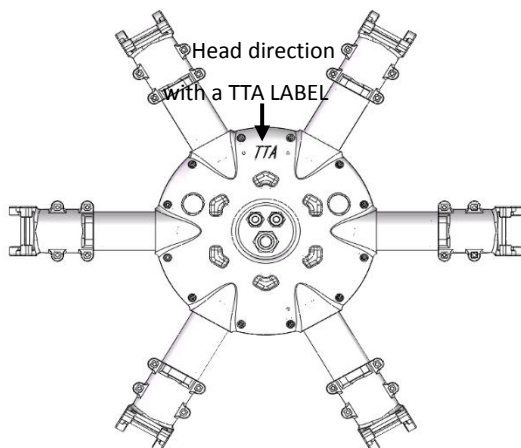


Figure 1

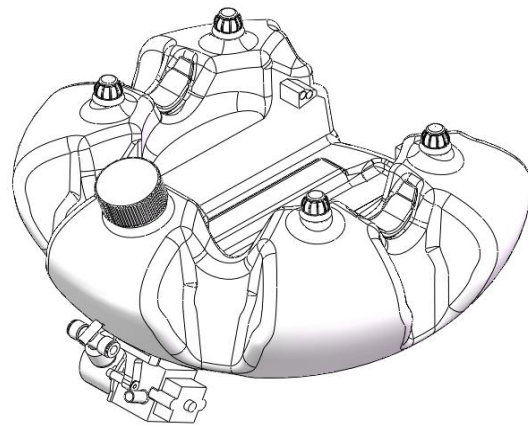


Figure 2

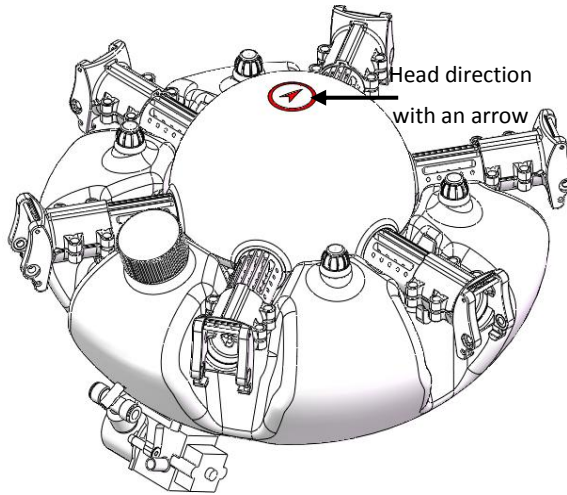


Figure 3

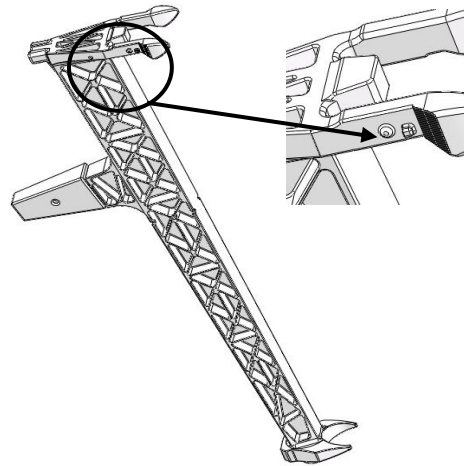


Figure 4

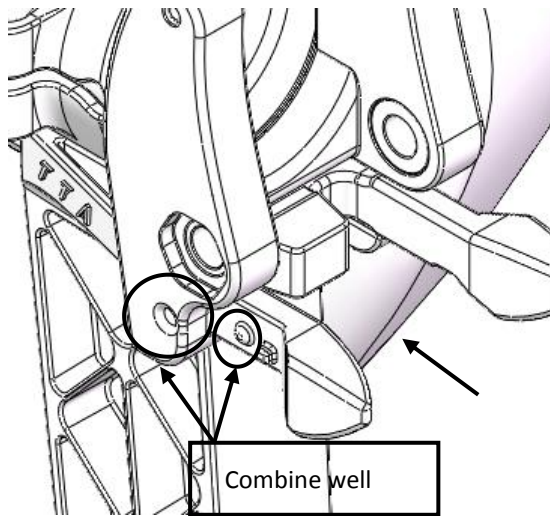


Figure 5

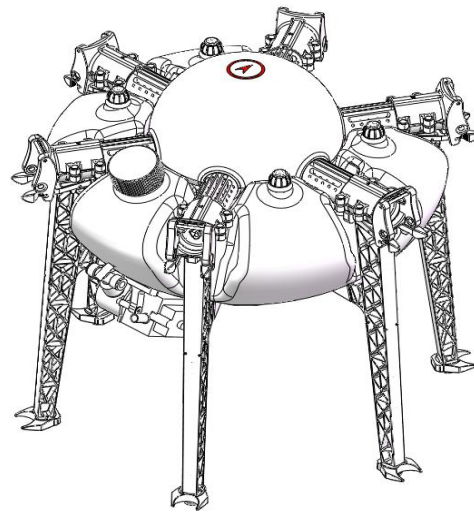


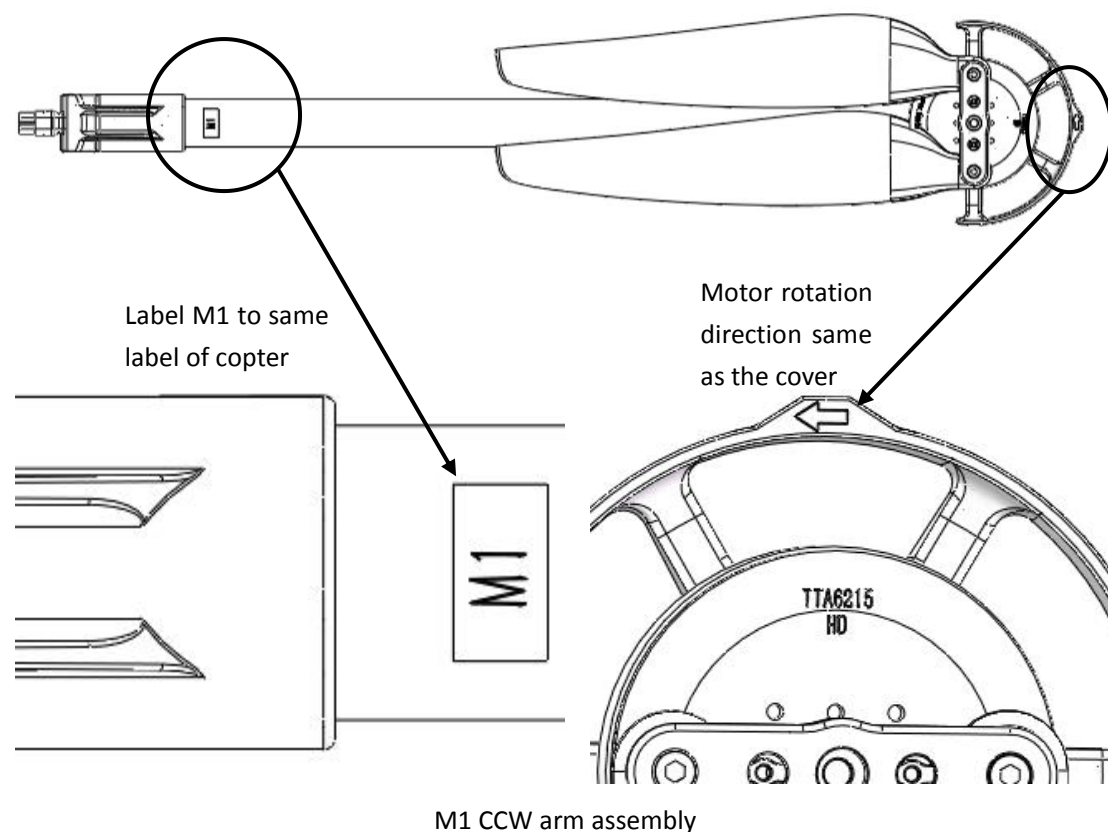
Figure 6

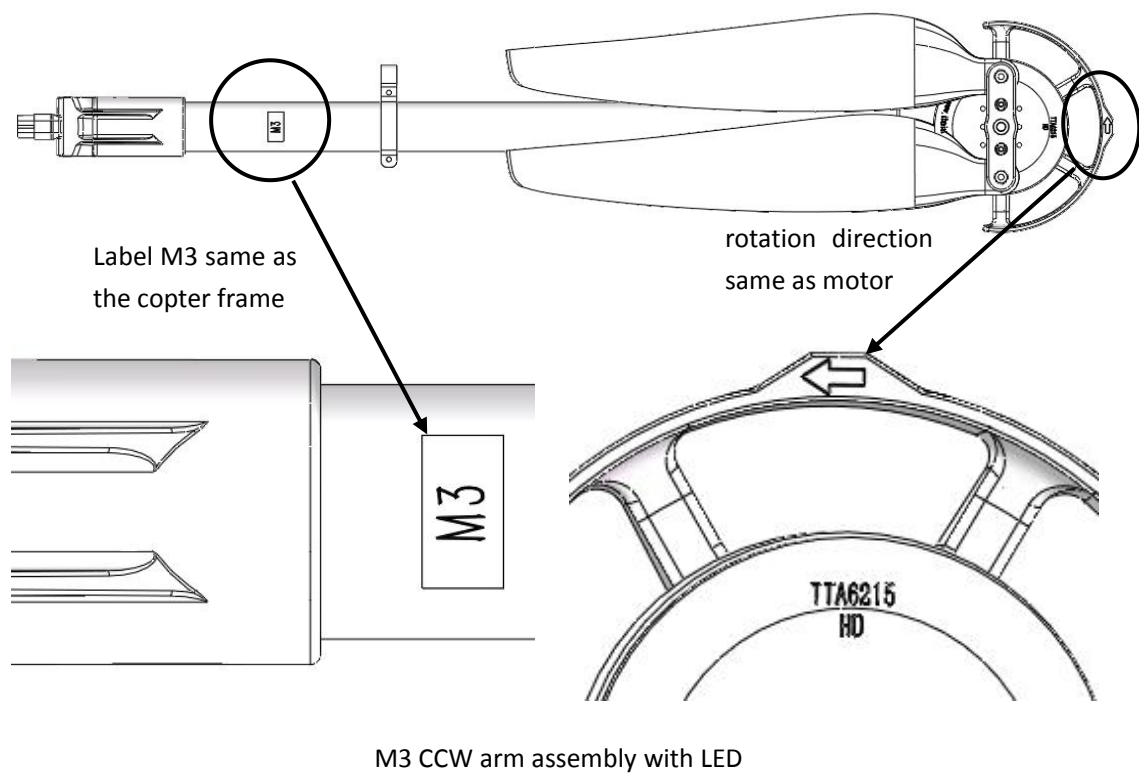
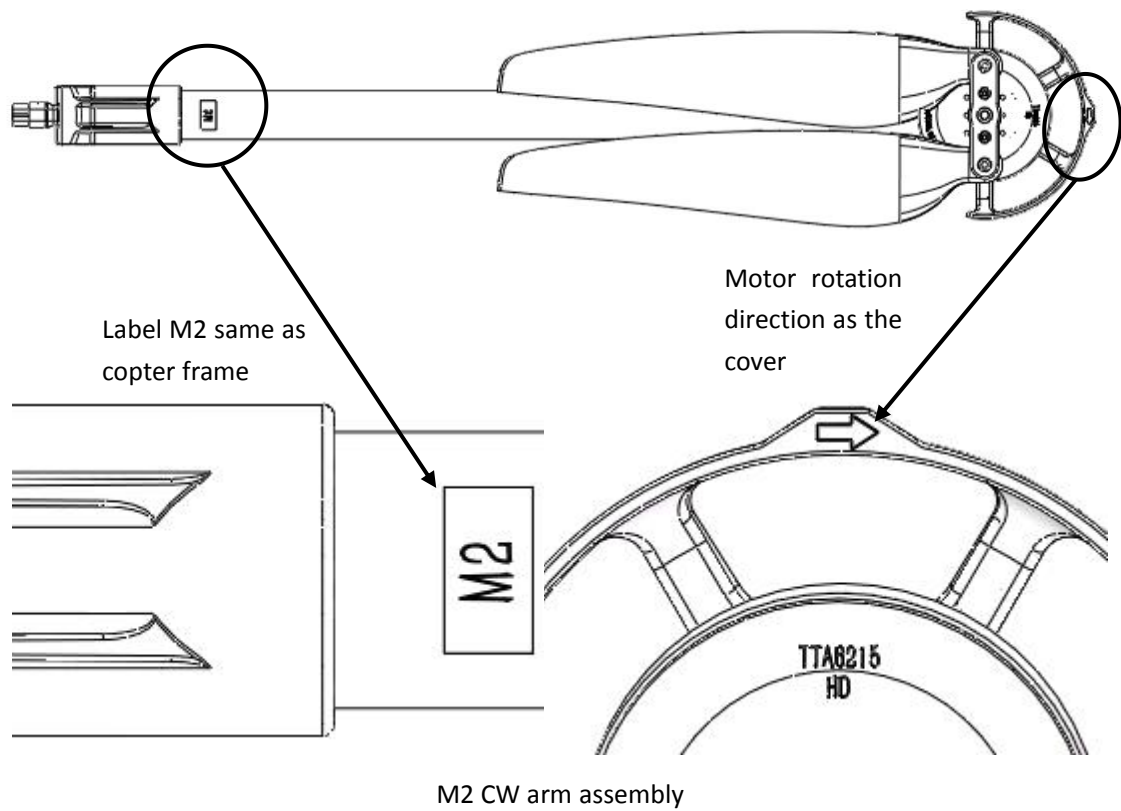
Marking on the corresponding position of the fuselage and water tank kit as the Figure1-2.(TTA label is the head direction,tank lid is the tail direction)

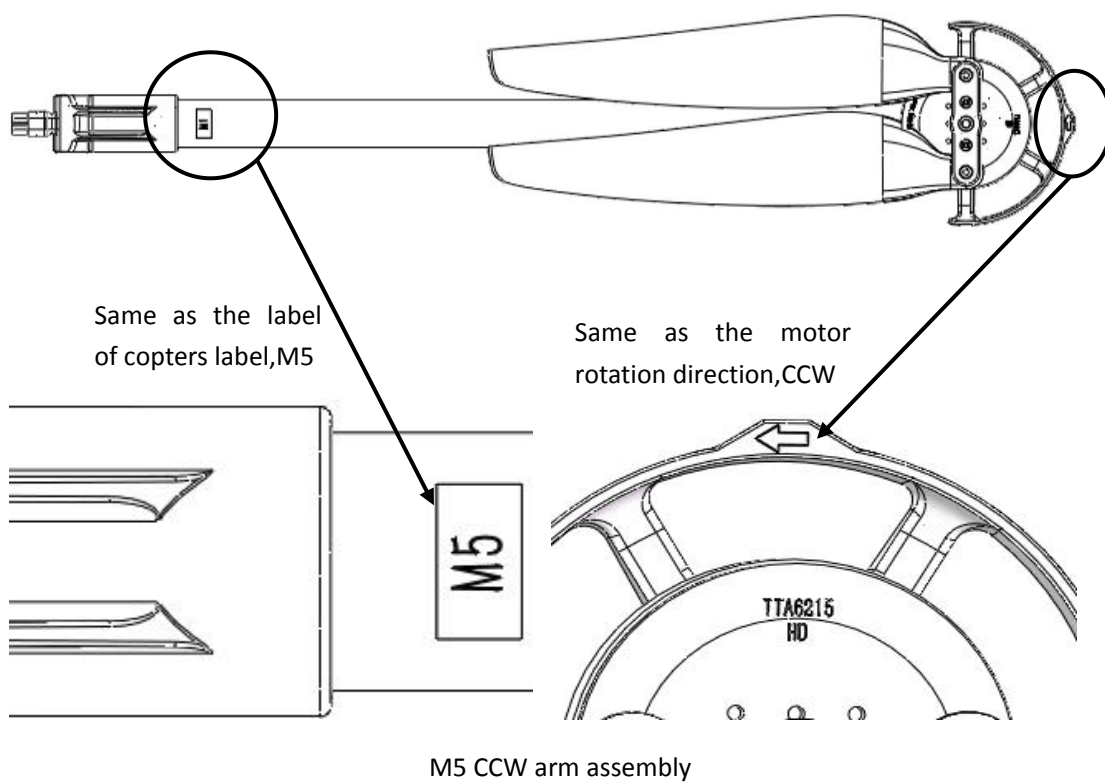
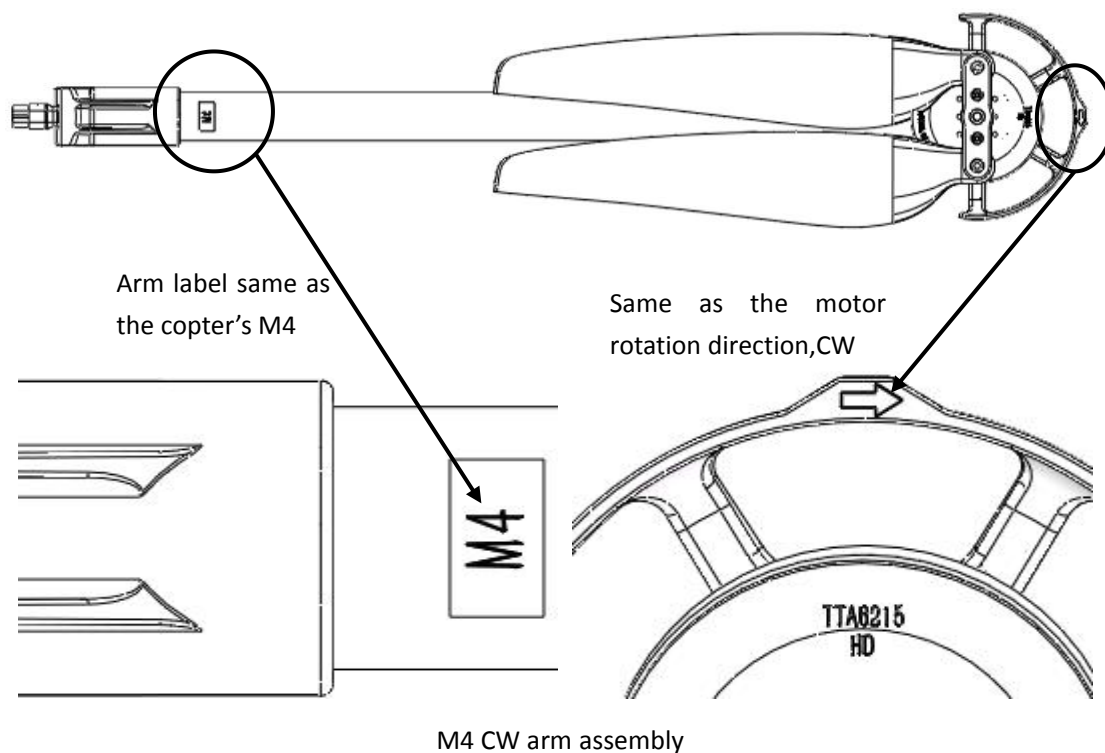
- 1) Put the fuselage bottom upward as the Figure1.
- 2) Install the fuselage and the water tank kit according to the mark ,1-3,2-4. It will be completed like Figure3.
- 3) Marking on the corresponding position of the 6 landing gears as Figure 4.
- 4) Slip the landing gear gently into the fillister mark 7. of fuselage as the “Mounting Direction” arrow of Figure5. Make the bulge mark 5. stuck into the fillister mark 8 and the part mark 6 get into the fillister mark 9 as the “Limit Direction” arrow to complete the installation.
- 5) The rest 5 landing gears should be installed as above. It will be completed like Figure 6.

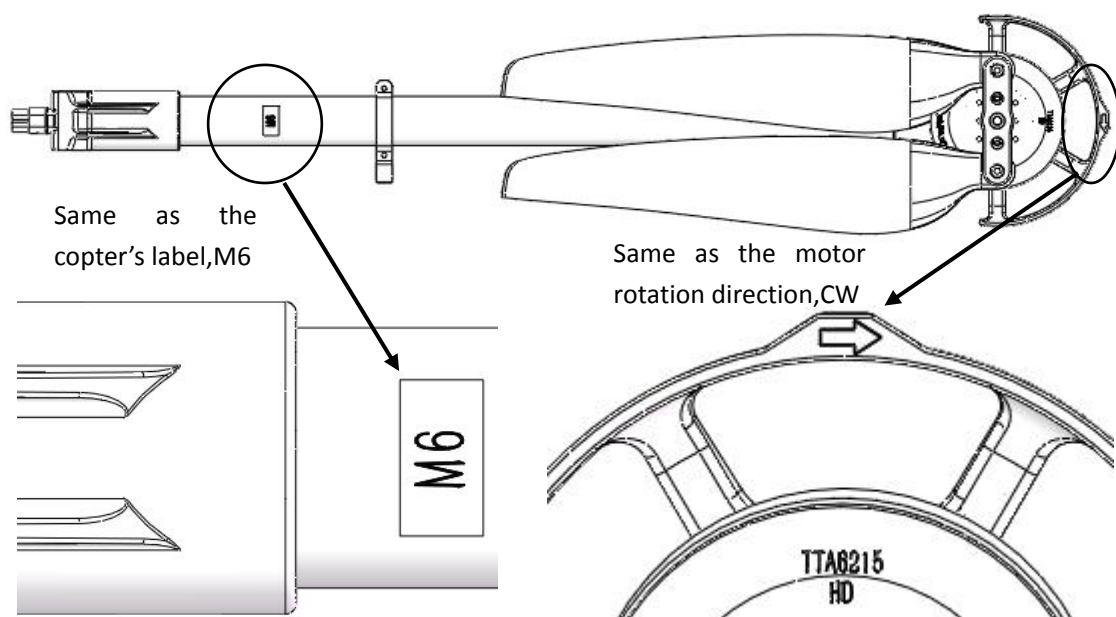
2.3.2 Arm Installation

Make all the arms ready: 1 clockwise(CW) arm with LED, 1 counter clockwise(CCW) arm with LED, 2 CW arms and 2 CCW arms. Totally 6 arms.

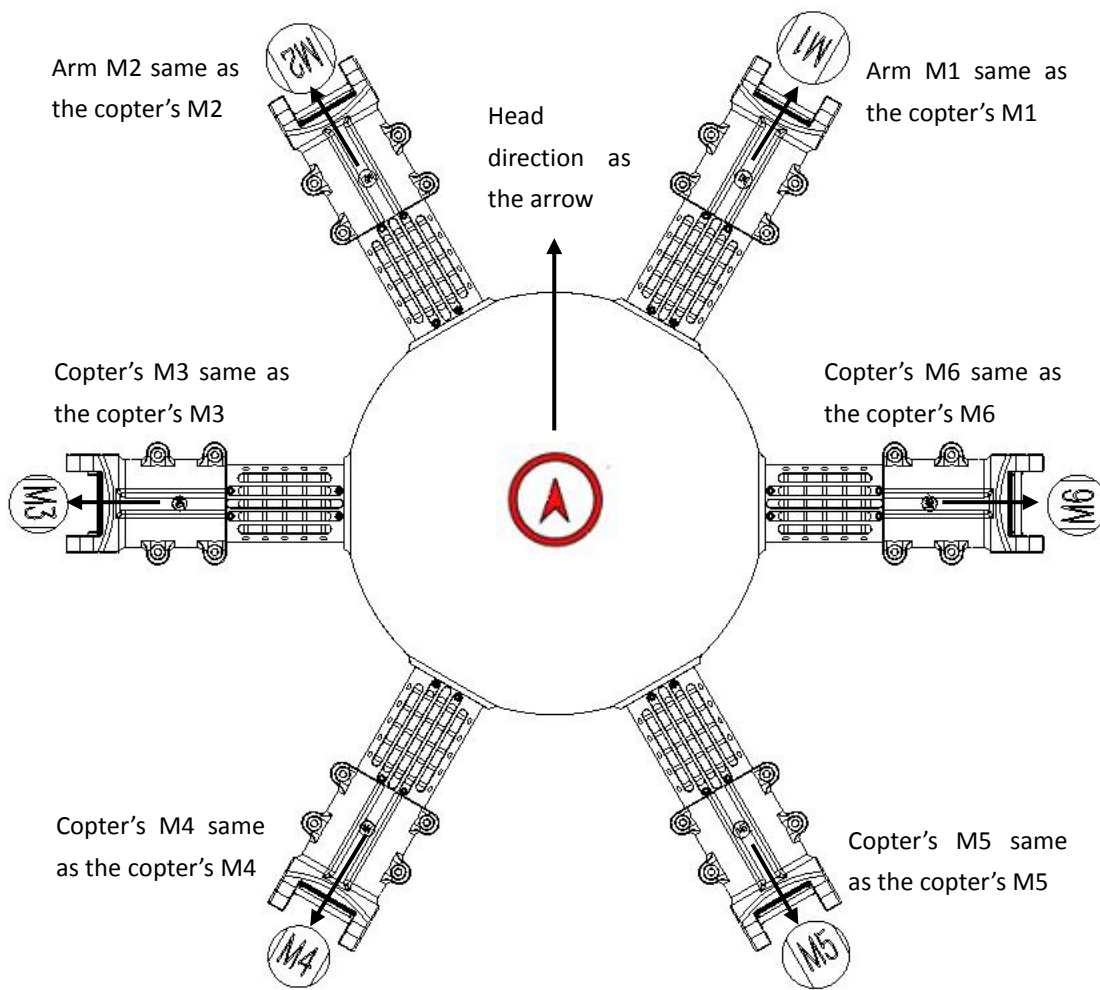








M6 CW arm assembly with LED



Arm and copter installation figure

- 1) Arm M1-M6 should be matched with copter's.
- 2) Match the arm's MT60 female connector with copter's MT60 male connector, see figure 8.
- 3) Match 6mm inner hole of arm clamp with copter's main part 6mm inner hole, see figure 9.

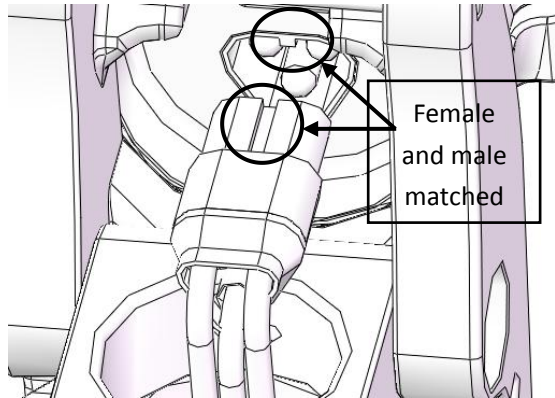


Figure 8

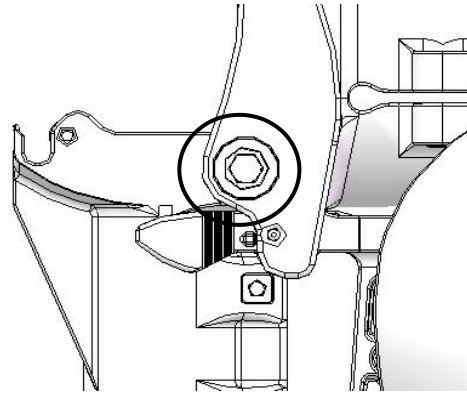


figure 9

- 4) Install the M5*49 plug screw from the hexagon side of the 6mm hole on fuselage arm joint, see figure 10.
- 5) Lock the plug screw with a M5 nut from the other side, the bolt end should be the same as the nut, that means lock works, as Figure 11

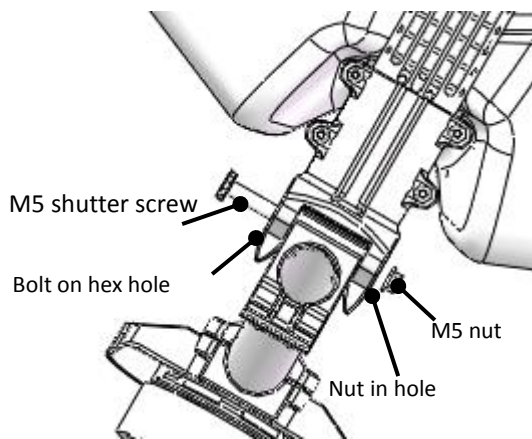


Figure 10

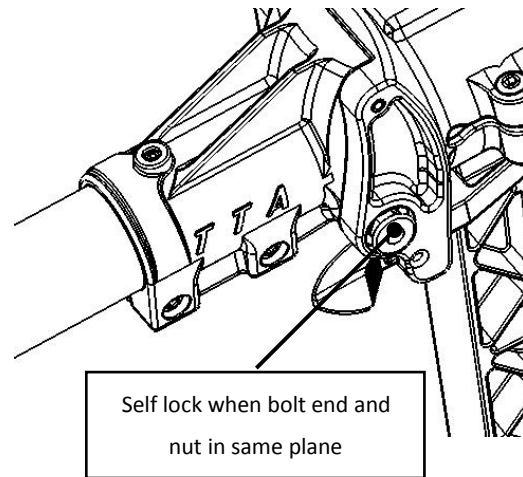


figure 11

- 6) Install the rest 5 arms as above, it will be completed like Figure 12.

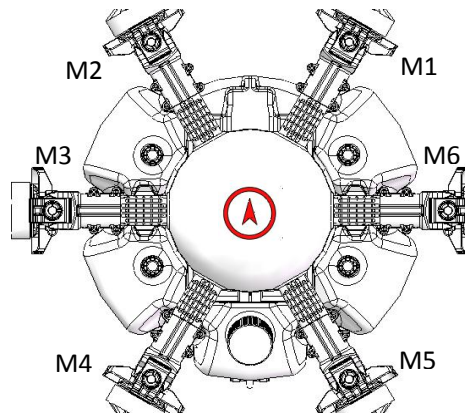


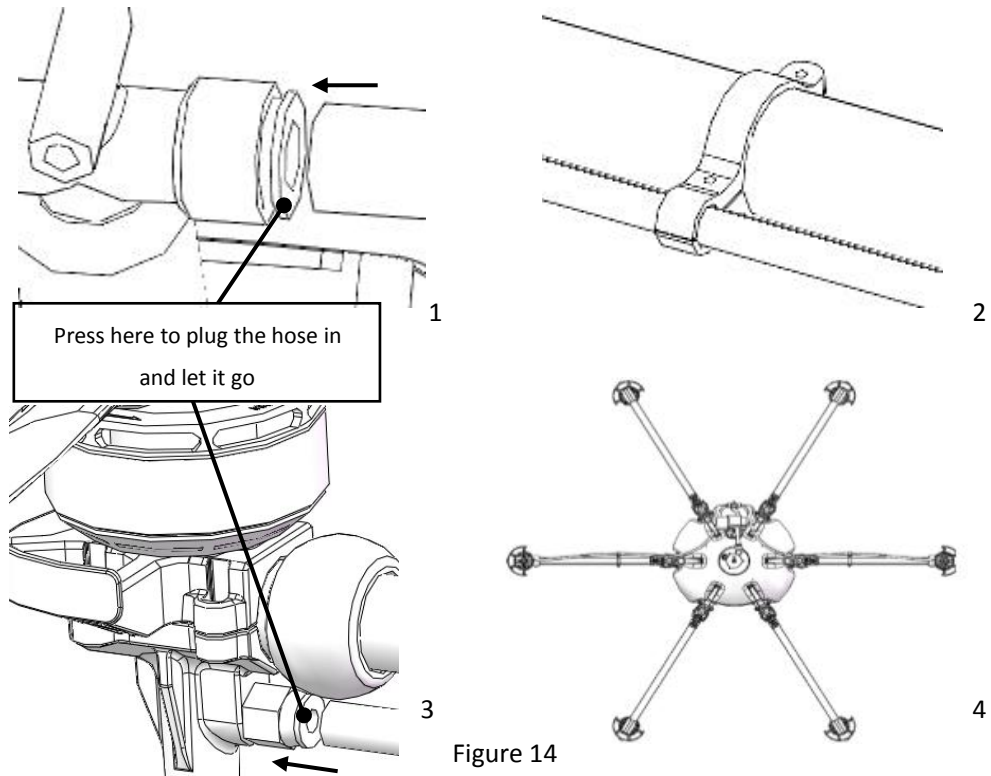
Figure 12

**Attention:**

- 1) The difference between CCW arm and CW arm is different rotation direction of the propellers which produce lift force. There is a mark arrow on every motor holder to help differentiate. CCW arrow means CCW arm, you need to install the CCW propeller, otherwise it will be CW arm which you need to install the CW propeller.
- 2) The difference between Arm with LED and normal Arm is that there are LED ring and spraying system on the Arm with LED and the other doesn't have.
- 3) There is a indicate arrow on the Dome which show the nose.
- 4) According to the Figure 7, install CCW arm on M1 and M5, install CW arms on M2 and M4, install CCW Arm with LED on M3, install CW Arm with LED on M6.
- 5) Arm could only fold down instead of up during the installation, arm should be in an horizontal level with ESC

2.3.3 Spraying Tube Installation

- 1) First, insert the $\Phi 8$ spraying tube into the three-way connector as Figure 14-1. Second, through the spraying tube from the tube holder as Figure 14-2. And then inset the other side of the spraying tube into the one-way connector at the nozzle place as Figure 14-4. Install the other spraying tube the same way.
- 2) It will be completed like Figure 14-3.



2.3.4 Intelligent Battery Installation

- 1) Push the Intelligent battery into the water tank as Figure 15-1, due to interference fit, it will be installed well when the battery wear pad stuck into the position Mark 3 in the Figure 15-2. It will be completed like Figure 15-3.
- 2) The whole copter will be completely installed like Figure 15-4.

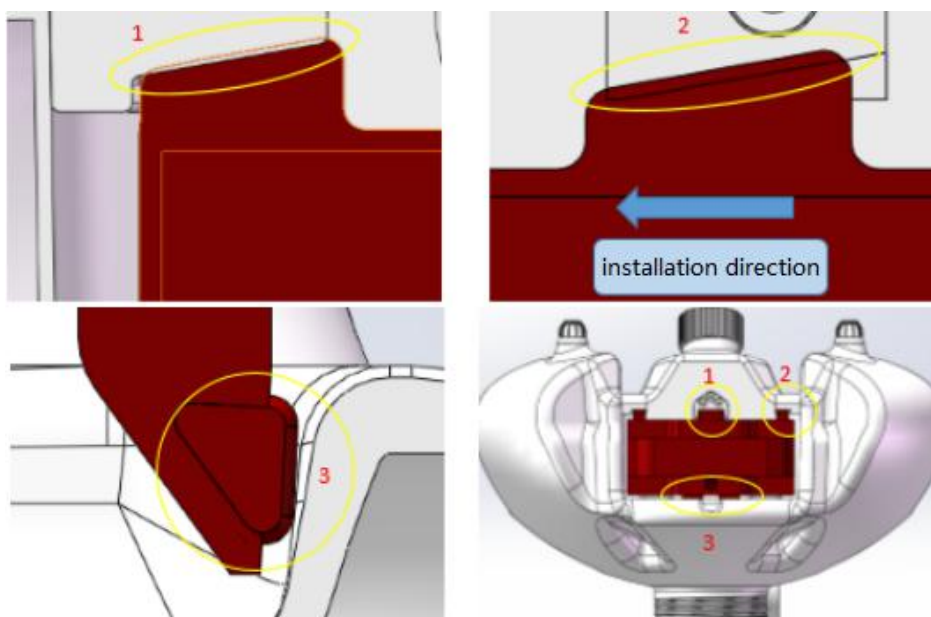


figure15



3.Intelligent Battery Instruction

3.1 Key Function

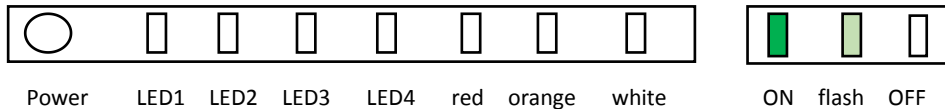
- 1) Short press 1S to check the battery real-time electricity.
- 2) Long press 5S to check the battery residual life.
- 3) Short press 1S + Long press 2S to turn on the battery and charge.
- 4) Short press 1S + Long press 2S to turn off the battery.

Attention:

The battery need to be power on when charge and discharge, the charge port will be opened when the battery power on and be closed when the battery power off.

3.2 Electricity Inspection

When the battery is power off,you can check the real-time electricity with a short press.



Attention:

Electricity indicate light represents both the quantity of electricity when charge and discharge and also the life of the battery.

Battery Indicate Light

Indicator LED1-LED4	Battery Electricity	Green LED1	Green	Green LED3	Green LED4
	0%~12%	Flash	OFF	OFF	OFF
	13%~24%	ON	OFF	OFF	OFF
	25%~37%	ON	Flash	OFF	OFF
	38%~49%	ON	ON	OFF	OFF
	50%~62%	ON	ON	Flash	OFF
	63%~74%	ON	ON	ON	OFF
	75%~87%	ON	ON	ON	Flash
	88%~100%	ON	ON	ON	ON



3.3 Lifetime Inspection

Battery lifetime means rest service time,electric quantity indicator means battery lifetime by keeping pressing power button for 5 seconds in the status of no electricity.All of indicator will be off if let go the button for 3 seconds.

Indicator LED1-LED4	Green LED1	Green LED2	Green	Green	Green
	ON	ON	ON	ON	ON
	ON	ON	ON	Flash	ON
	ON	ON	ON	OFF	ON
	ON	ON	Flash	OFF	ON
	ON	ON	OFF	OFF	ON
	ON	Flash	OFF	OFF	ON
	ON	OFF	OFF	OFF	ON
	Flash	OFF	OFF	OFF	Flash

3.4 Charging

- 1) Setting, connecting intelligent battery and charger. Step1: Turn on the battery by a short press and a long press according to the instruction. Step2: Connect balance connector and then XT 60,then XT90S or AS150 anti spark connector. Step3: Start regular charging automatically.
- 2) Electric indicator will flash in cycle and displays the current electric quantity.
- 3) It means the intelligent battery has been full when electric indicator is OFF.Please take down the charger and charging has been finished.
- 4) The charging temperature of intelligent battery is 10°C to 40°C ,it's forbidden to charge above 45°C or less than 5°C .
- 5) Please do not charge the battery without people.
- 6) Forbid to charge with the output connector and forbid to use the battery power when charging.



Attention: Please disconnect the discharging cable before charging.

Indicator LED1-LED4	Battery	Green	Green	Green LED3	Green
	0%~25%	Flash	OFF	OFF	OFF
	26%~50%	Flash	Flash	OFF	OFF
	51%~75%	Flash	Flash	Flash	OFF
	76%~99%	Flash	Flash	Flash	Flash
	100%	OFF	OFF	OFF	OFF

3.4.1 Charging Protection Function

- 1) The best charging current for intelligent battery is 0.5C,20A is maximum supported,large charging current will not benefit to prolong battery lifetime,it's forbidden to charge higher than charging current.
- 2) If there is abnormal(short circuit of charging end) during charging status,charging will be interrupted automatically in order to ensure to not damage to battery cell.
- 3) It will benefit to battery lifetime to set highest protection voltage of each cell according to different charging current.

Attention:

Restart should be done after any protection to ensure the abnormal has been eliminated and protection has been effective.

3.5 Reminding Functions

3.5.1 Maintenance Reminder

The red indicator will be kept on to remind to maintain before using if there is too high voltage difference of batteries or over discharging.

3.5.2 Low Voltage Alarm

System will take it as low voltage if 2.5V~3.65V per cell checked,charging will be reminded and orange LED will be on.

3.5.3 Storage Reminder

Over high voltage for long time will lead to battery cell expansion,thus system will



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remind user storage status and decrease the voltage to reasonable range in long time storage or over high temperature,LED will keep white at the same time.

Error Indicator

Red LED5	Orange LED6	White LED7	Instructions
ON			It reminds battery maintenance
	ON		Battery voltage is too low
		ON	Battery is in storage status

3.6 Self Balance and Self Storage in Storage

- 1) Intelligent balance:inside battery balance will adjust little to prolong charging and discharging time.
- 2) Intelligent storage:battery will adjust to the most suitable storage capacity automatically for long term storage.

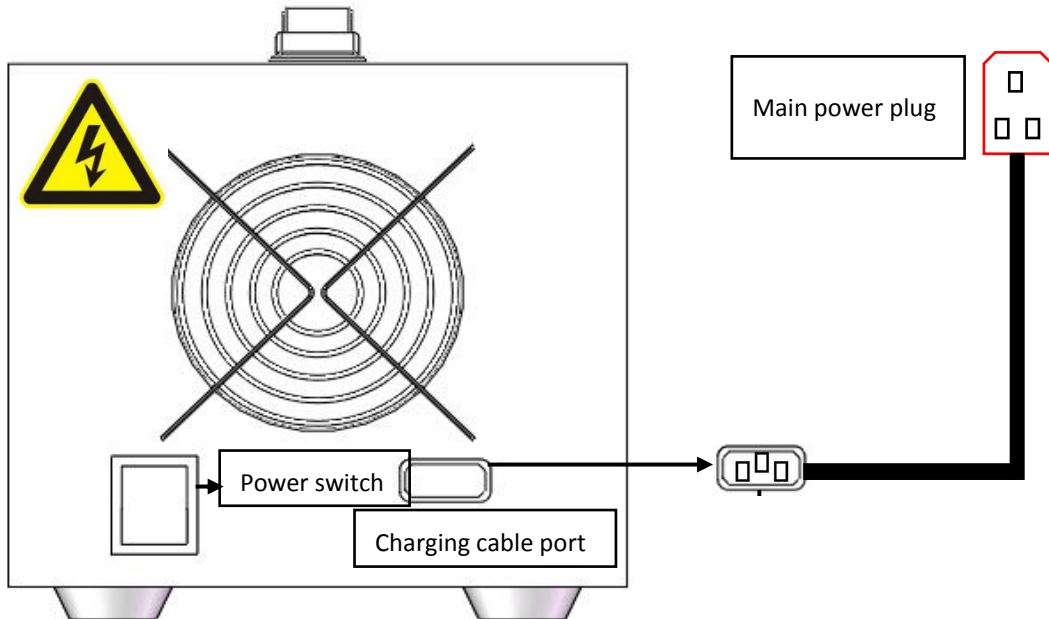
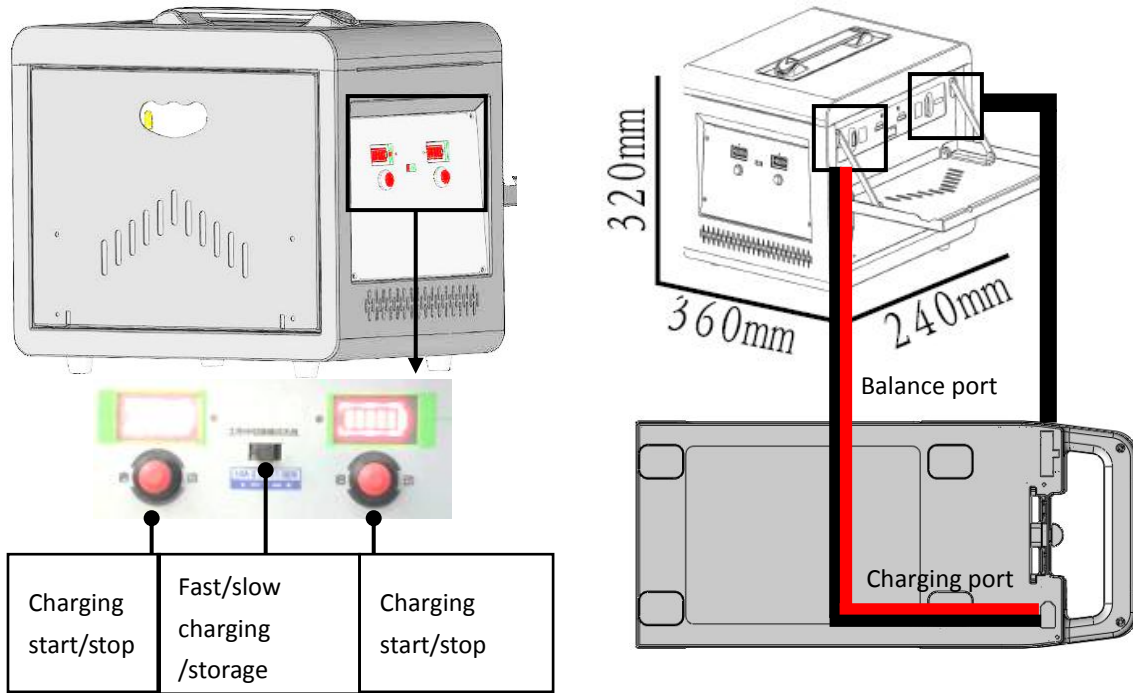
4.Charger Station Introduction

4.1 Production Parameters

- 1) Input voltage: 190V~ 220V AC
- 2) Max. charging current: CH1:20.0A CH2:20.0A
- 3) Max. charging power:CH1:1000W CH2:1000W
- 4) Output voltage:CH1:50.4V CH2:50.4V
- 5) Max. balance current:400mA
- 6) Max. static power consumption:320mA
- 7) Display mode: LED
- 8) Supported battery cells:12S
- 9) Charging working temperature:5-45°C
- 10) Weight:16KG
- 11) Production size:360*340*320



4.2 Wiring Diagram



4.3 Indicator Instruction

Indicator Status	LED0	LED1	LED2	Instruction
	Flash			Battery communication abnormal
		Constant		Please check battery connection line or battery voltage status
	Flash			Charging electric circuit abnormal
			Constant	Please contact after sales of factory



Advice:

- 1) Please do not disconnect battery with charger after charging so that battery could be balanced well and its life could be extended.
- 2) The minimum single battery cell voltage will be adjusted to less than 3.85V or the group voltage will be less than 46.2V during storage status. Storage status will end if total voltage is more than 46.2V or battery is not balanced any more, it cost longer for bigger battery unbalance.

4.4 Product Function Feature

- 1) Balance charging
- 2) Rapid charging
- 3) Input and output reverse connection protection
- 4) Low static power consumption
- 5) Folding charging platform

4.5 Operation Instruction

- 1) When power on 220V,leave power switch in the position OFF means input power is shut off, charger does not work.
- 2) When power on 220V, leave power switch in the position POWER,input power has been open, battery figure L0 on the screen is lightened, inner fan begin to rotate and charging channel close at the same time.
- 3) **How to charge: Turn on the battery by a short press and a long press according to the instruction 3.1 first,then connect XT 60 input connector and balance connector separately, progress bar of battery type signal flash,electric quantity indicator displays red, inner fan and outside fan run together, it means the state of charging.**
- 4) During charging, charging or abnormal status will be stopped if start button has been pressed.
- 5) If charging status is displayed not good after charging, please do not disconnect battery without urgent use, thus battery life will be prolonged.
- 6) Battery will discharged by charger for full charge storage, discharging will be stopped when single cell voltage lower than 3.85V or total voltage lower than 46.2V,but balance current will not be stopped until battery balanced or disconnected. Please do not disconnect battery to avoid total voltage less than 46.2V but storage status has been reminded if battery is not balanced,and it will costs long time.

Safety Warning:



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- 1) Charger will not work normally or be damaged for too high or too low input voltage.
- 2) 12S(50.4V) LiPo battery is suitable to this product, correct battery should be chosen.
- 3) Please take care of charging status when charger connecting, stop operation for any abnormal phenomenon.
- 4) Be sure charger is far away dust,moisture,rain,heat source,direct sunlight,vibration and some other unsuitable environment.
- 5) Battery and charger must be placed on unflammable,insulated surface.
- 6) Please follow the strict instructions.

5. App Setting of Copter

5.1 Software Configuration

1. Please install the GCS software.
2. After GCS installation,the label will be appeared as figure 5-1.



Figure 5-1



TTA-M6E-1 support Android 4.0 or above

3. Open GCS,enter into the start page.
4. Enter into the main page ,see figure 5-2.

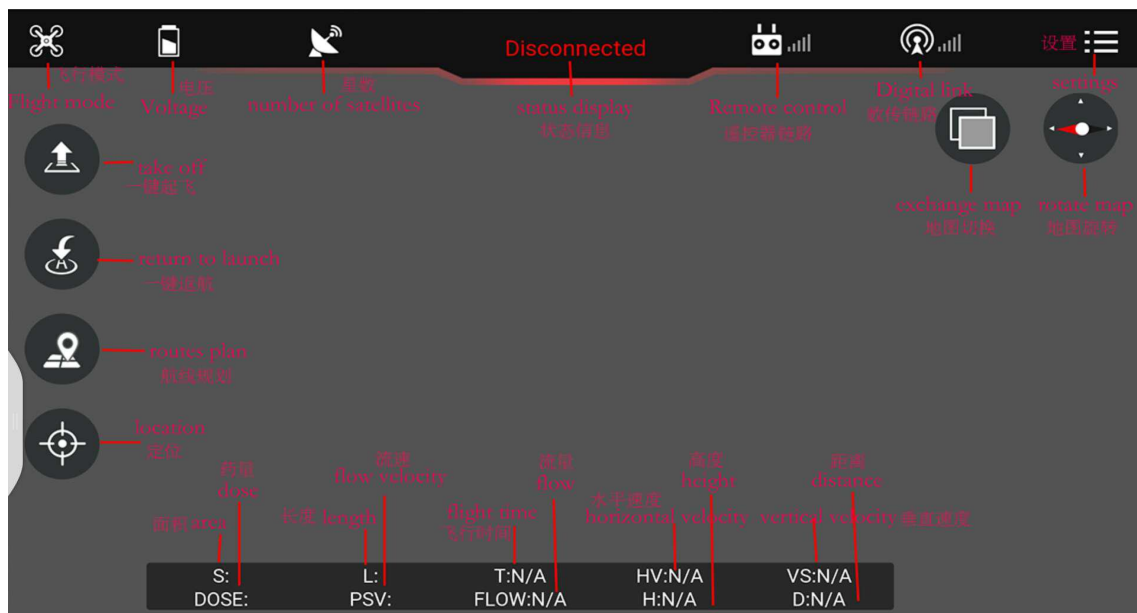


Figure 5-2



5.2 Parameters Adjustment



- Sensitivity should not be changed by common user,the unnecessary loss should be taken by user for authorized changing.
- Remote controller could not unlock before parameters adjustment.
- Exit could only be done when all of the parameters adjustment should be done and confirmed.Copter could only fly by restarting after parameters adjustment.

Parameters could be adjusted when copter connected,the steps are as followings:

1) Open the OTG function from cellphone SETTINGS---SYSTEM---OTG(the default is Off thus it should be opened every time),see figure 5-2-1.

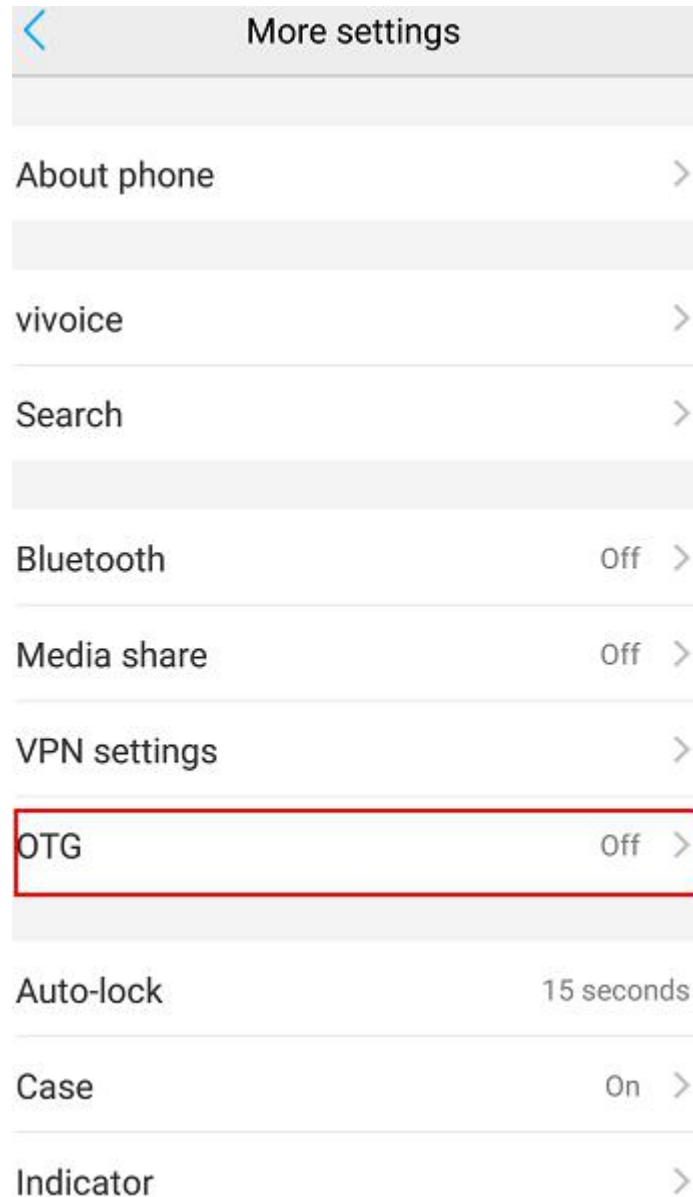


Figure 5-2-1

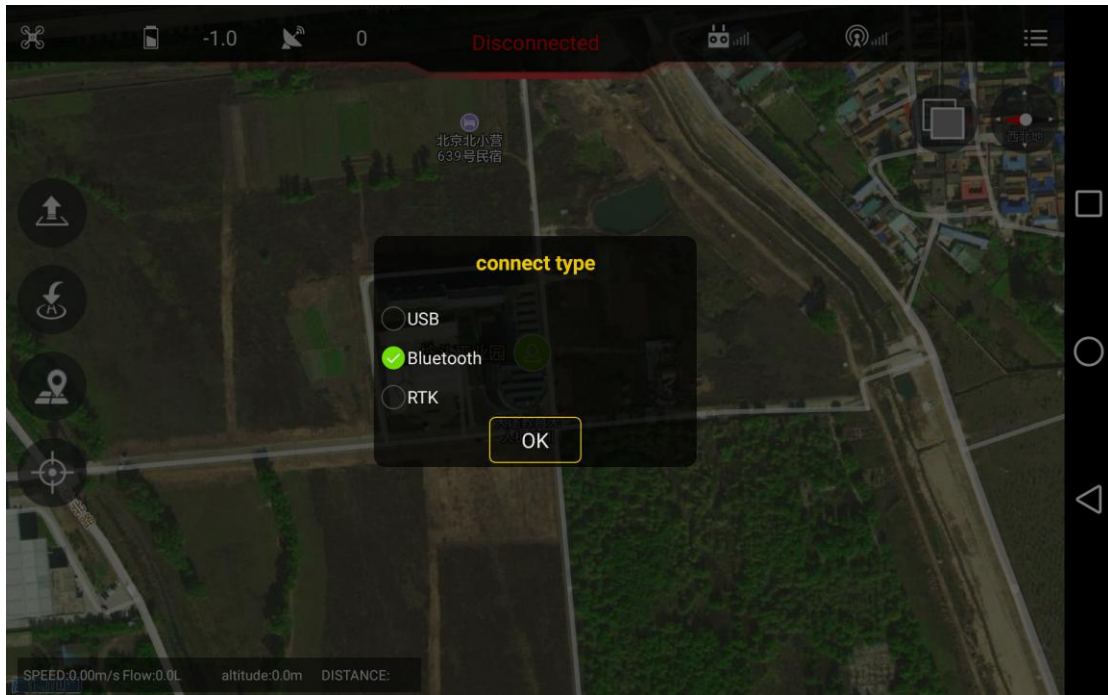


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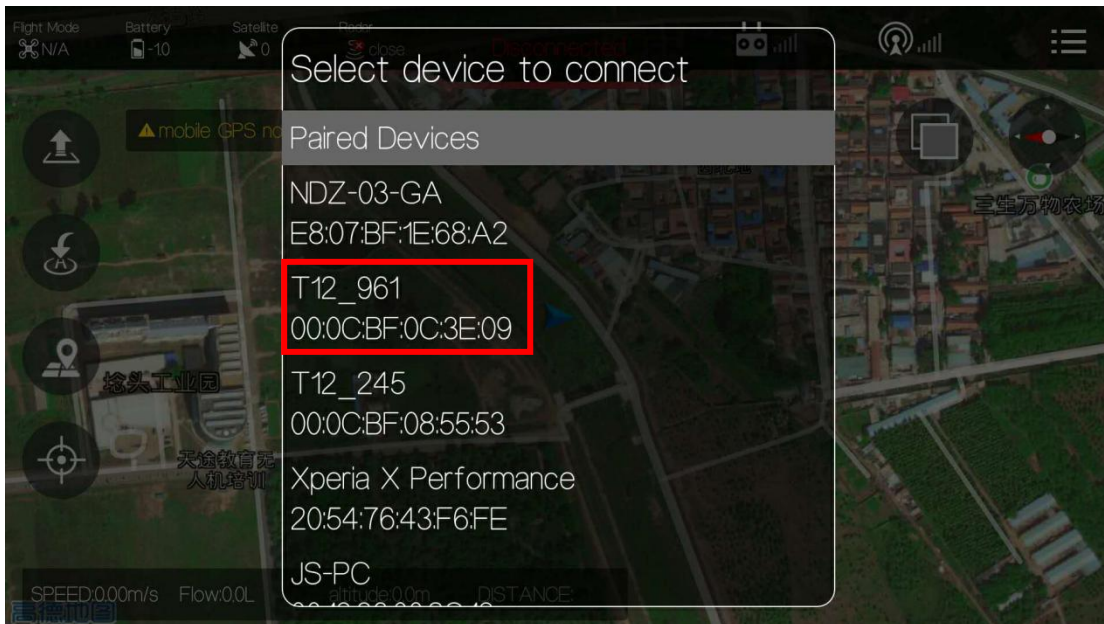
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2) Bluetooth connection

Open the bluetooth function in cellphone,Open the bluetooth function in cellphone. Set the connect type of APP on Bluetooth mode.



Connect the bluetooth of remote controller. Remote controller Bluetooth name: **T12_*****, password:1234

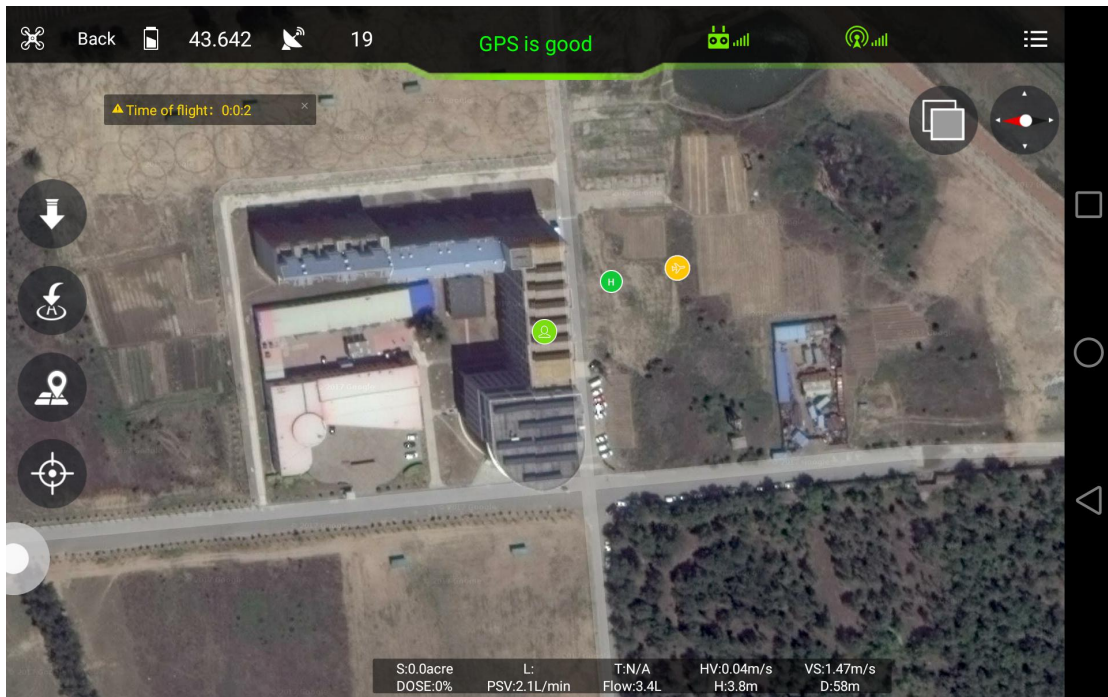





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3) After connection,app will be as followings,see figure 5-4



5-4

4) Click label  at up right corner to enter into parameters adjustment.

5.2.1 Remote Controller Calibration

Remote controller calibration:click the button *READ* to get the data,see the following figure



1) Start to calibrate:connect copter with GCS,click *RC CHANNEL*,move the stick to



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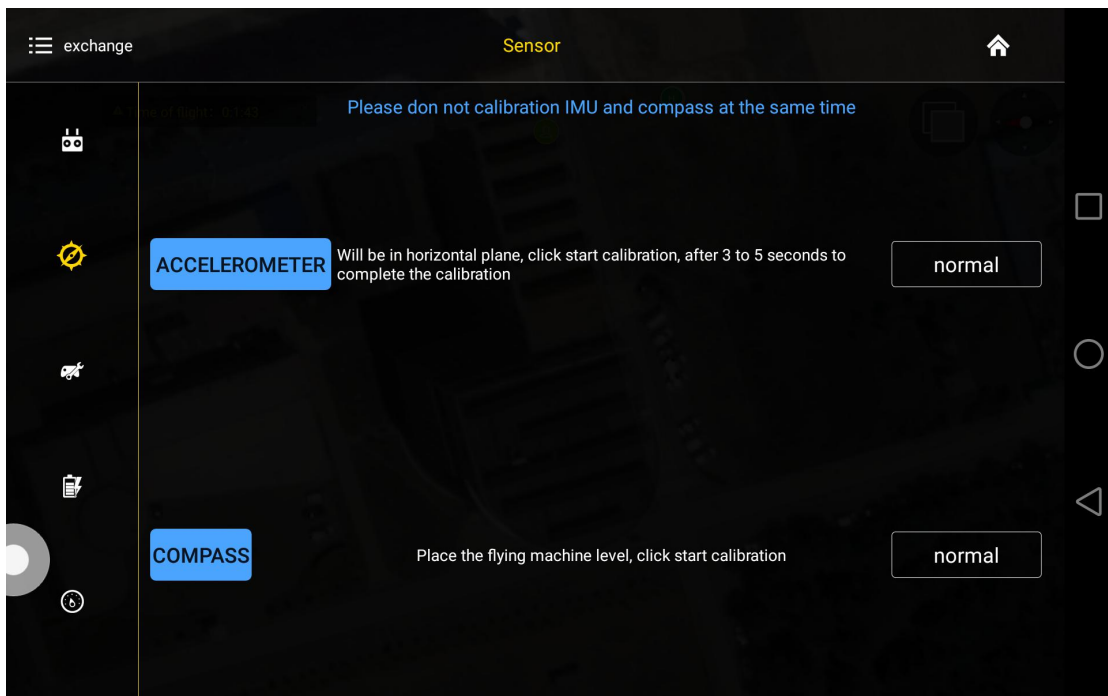
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maximum and minimum position 4 to 5 times.

- 2) Stop calibration:click Finish after calibration. Then check the channel status.
- 3) Normal or reverse setting of remote controller is set to check whether it's right or wrong.

5.2.2 IMU Calibration

Leave the copter in a horizontal position,click the button *ACCELEROMETER*,LED will flash in red,green,yellow alternately,LED *green* means successful calibration,data will be stored by restart.



5.2.3 Compass Calibration

Calibration order

Two kinds of method of compass calibration:

- 1) Click the button *COMPASS* to enter into calibration status.
- 2) Switch switch E back and forth more than 4 times to enter into calibration status.

Calibration Step

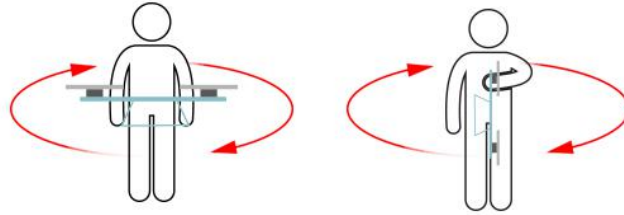
- 1) Confirm GCS communication well, compass installation correct and copter outside.
- 2) Clicking calibration, yellow LED of copter is on, hold and keep copter rotating clockwise and slowly, leave copter head to the ground when green led is on, rotate



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copter clockwise and slowly till LED flash in red,green and yellow alternately.



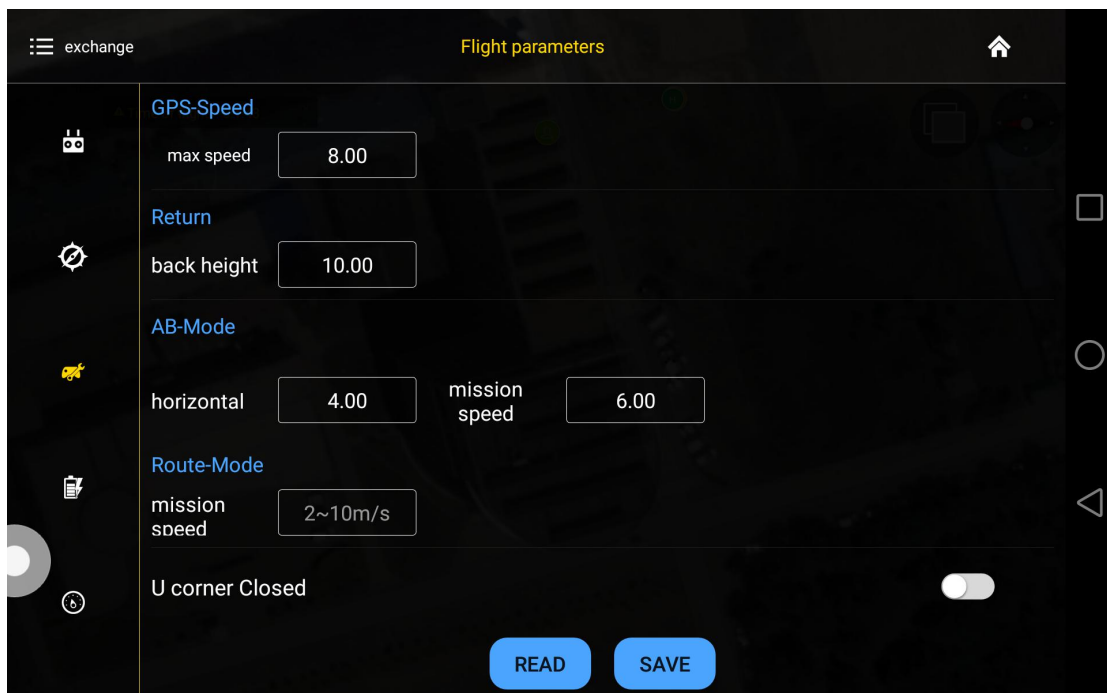
3) After vertical calibration,calibration mode will be exited automatically and LED will flash normally if successful. LED will keep red for 3 seconds.If fails,user need to calibrate again.

4) Please power again after successful calibration.

Attention:

- 1) Compass should be done after changing flying area.
- 2) Calibration should be done in outdoor,wild and far away from high tension line tower which is easy influenced by magnetic interference.
- 3) Keep horizontal and vertical during the slow calibration.
- 4) Clockwise is the only direction.

5.2.4 Flying Parameters Adjustment





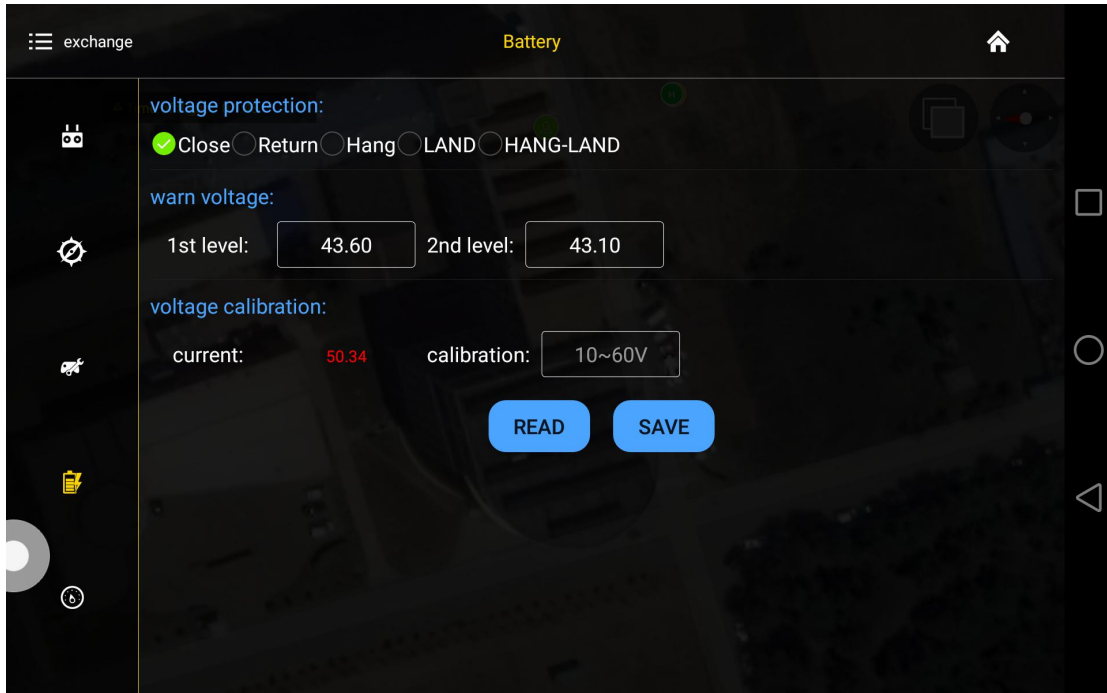
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Click the button *READ* to obtain the current flying parameters,click button *SAVE* to save the parameters.

The default number of back landing height is 20 meters,AB swath is 4 meters,route speed is 5m/s.

5.2.5 Low Voltage Protection



5.2.5.1 Low Voltage Protection Settings

Five voltage protection options for user to select: Close(close the protection), return(auto home landing), Hang(hovering),Land(auto landing), Hang-Land(hovering and then landing). User could choose the one suitable.**The default is Return(Home landing).**

5.2.5.2 Alarm Voltage Settings

Settings of first alarm and second alarm.It's recommended to 43.6V for the first alarm and 43.1V for second alarm.

LED will flash yellow triple when get to the first alarm level;LED will flash rapidly when get to the second alarm level,copter will react as the low voltage settings,such as return to home or landing.



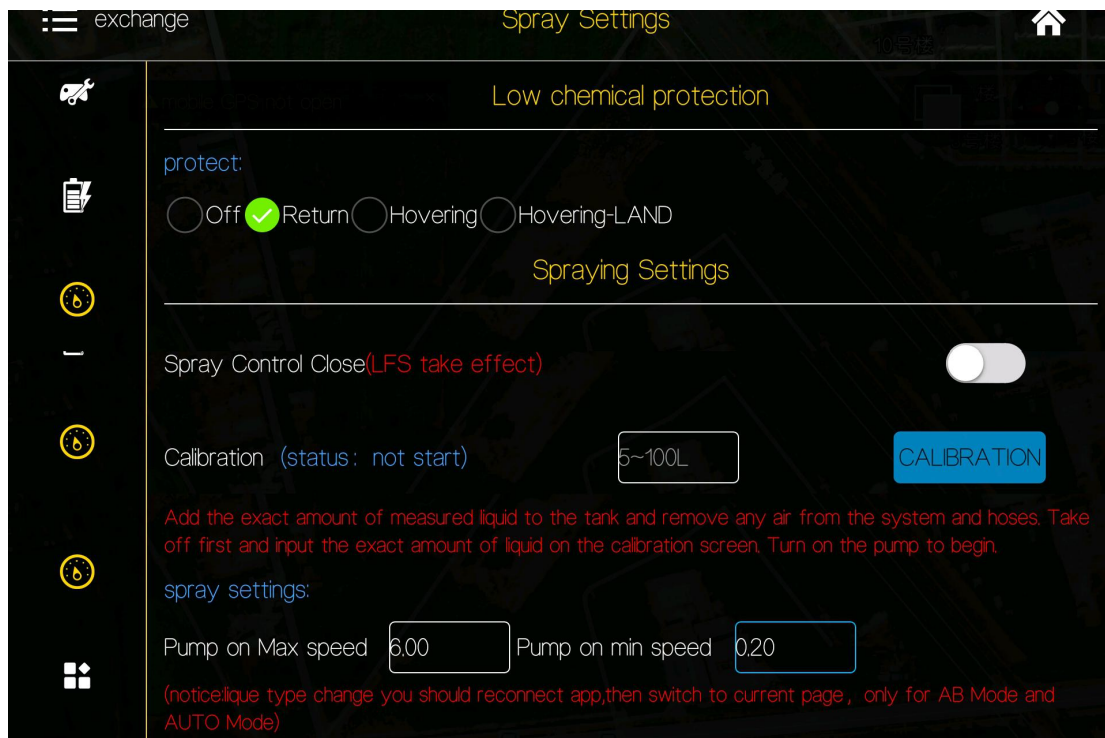
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5.2.5.3 Voltage Calibration Settings

Flight controller voltage sensor need to be calibrated if flight controller voltage sensor result is different from real voltage.Real battery voltage should be filled in measured voltage,flight controller voltage will be calibrated by clicking save. **It's unnecessary to set by user as calibration has been done before delivery.**

5.2.5.4 Low Liquid Protection



When liquid is nearly out, the following reaction could be set: Off(Close the protection), Return(auto home landing), Hovering, Hovering & landing. The default is Off, which means only LED flash as alarm. **We suggest you to set it on Return option.**

5.2.5.5 Spraying Mode

The drone has 2 spraying modes : Combination & Manual mode.

Combination mode: Spraying rate will follow flying speed. Faster speed, bigger flow rate.

Manual mode: Spraying always work under the biggest flow rate when in this mode.

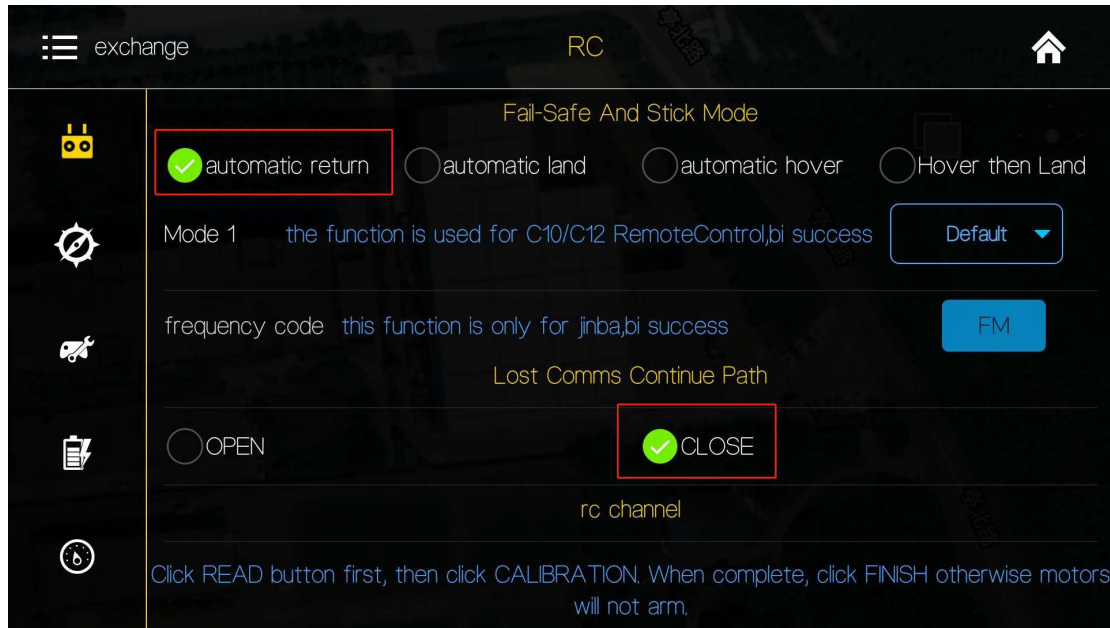
Combination control of the pump,max flow rate match to max flying speed. The maximum default combination number is 6m/s,minimum default combination number is 0.2m/s.



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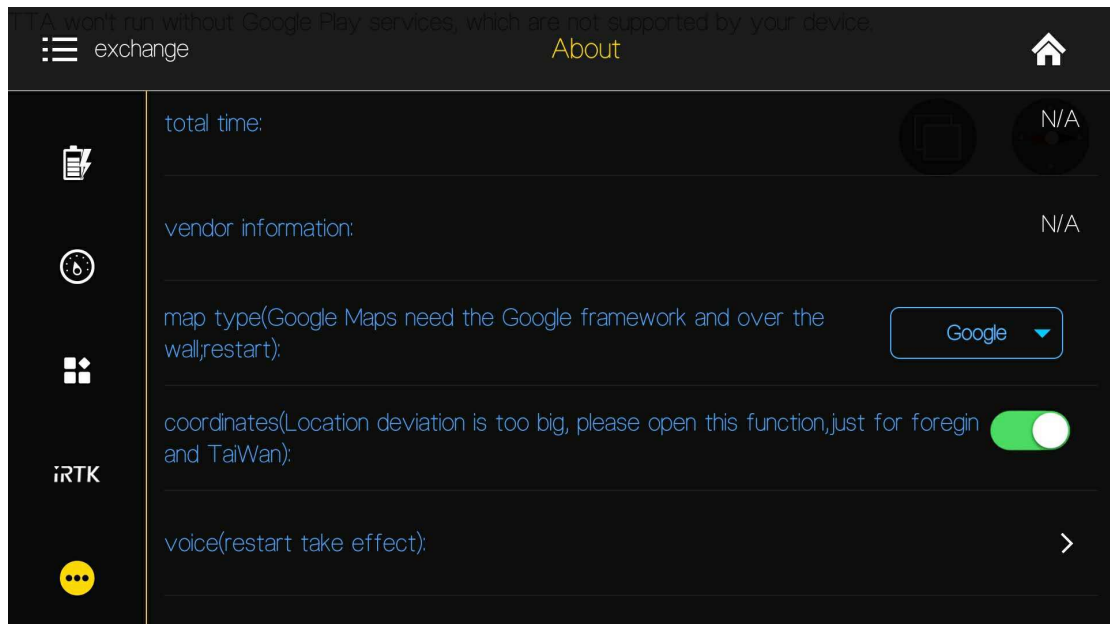
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5.2.6 Fail-Safe



When lost signals of RC, aircraft will enter into Fail-Safe status and execute the set Fail-Safe action. The default set is “*Automatic return*” which means Return To Home automatically. Besides, “*Lost Comms Continue Path*” is used to set whether drone will continue the mission after lost-control during a mission flight. If it is open, drone won't execute Fail-Safe action until its mission has been completed. The default setting is *Close*.

5.2.7 Map & Coordinates Offset





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Open 'About' interface, select Google map. Voice broadcast could be opened. It is suggested to open "coordinates" function if position deviation is obvious.

5.3 Route Establish

Four Automatic Operation modes: Map Point, Dot Equipment, Drone Point, Phone Dot.


Map Point mode: Dot on a built-in map to plan route.

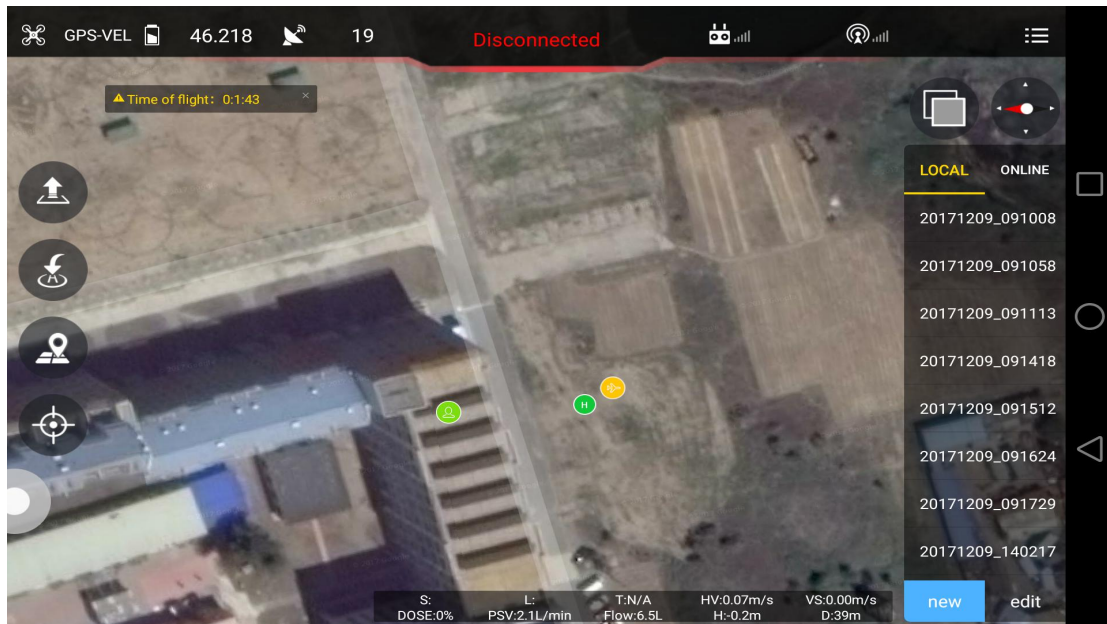
Dot Equipment: Use a Dot Equipment to make boundary points.

Drone Point: Drive drone to mark boundary points.

Phone Dot: Use Phone to mark boundary points.

5.3.1 Start Route Establish

1. Click  to enter into route interface.



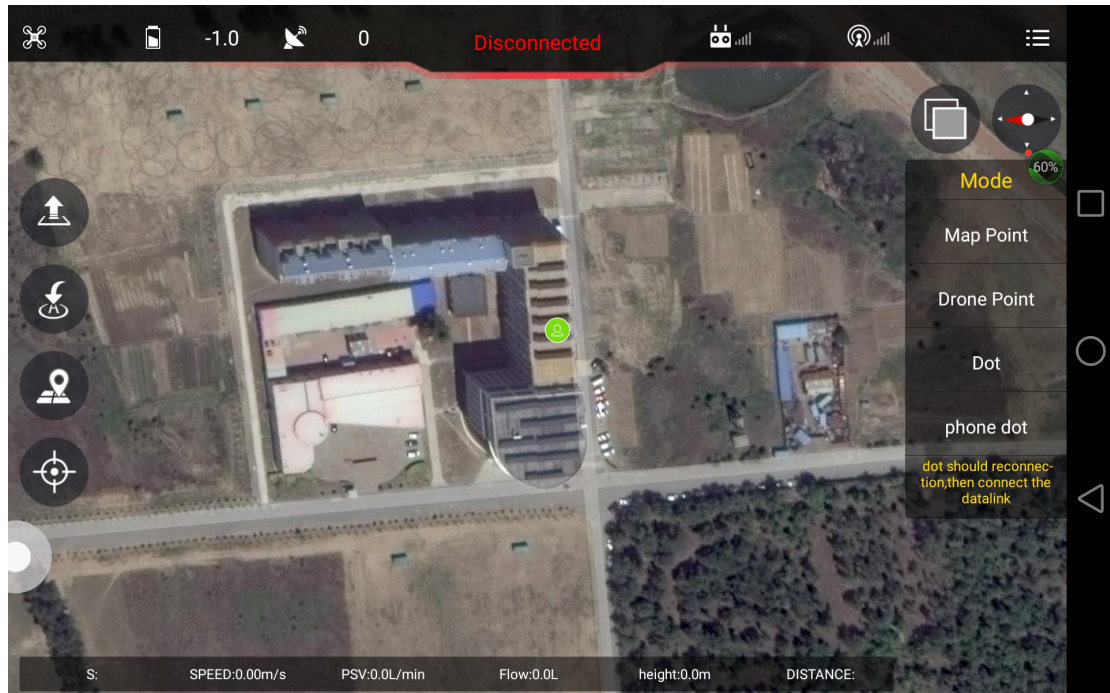
2. Click **new** to name the block and then select point making type.



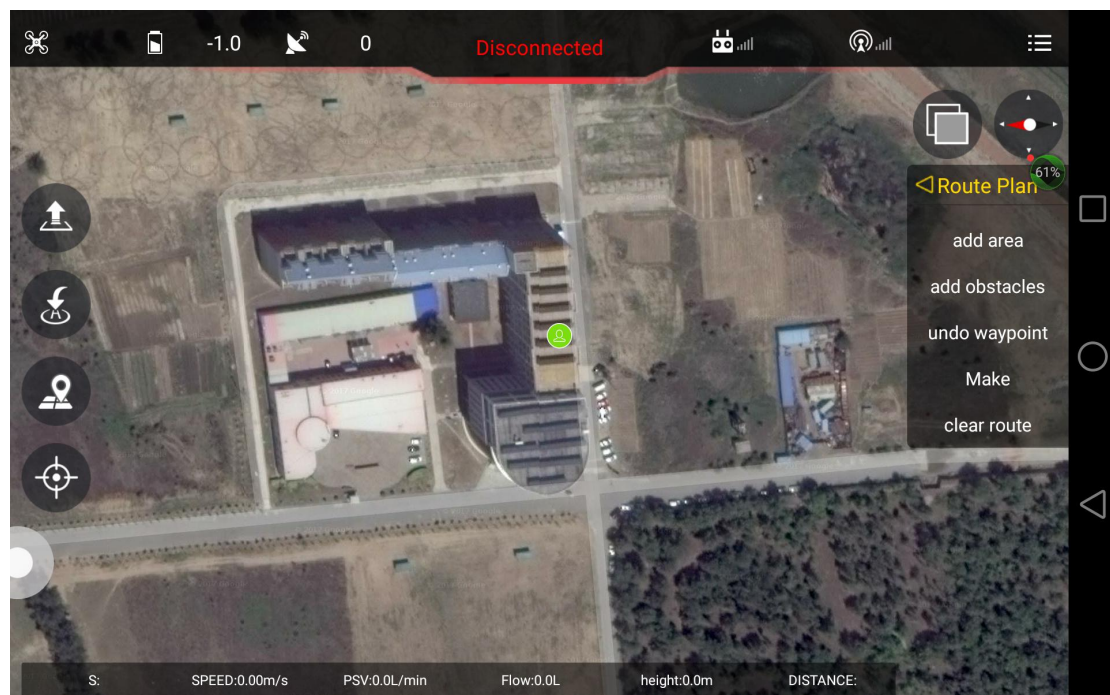


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5.3.2 Map point



- 1) Select **Map Point**.
- 2) Click **adding area** and click the boundary point on map to set the working area. Obstacles could be added by clicking **add obstacles**.



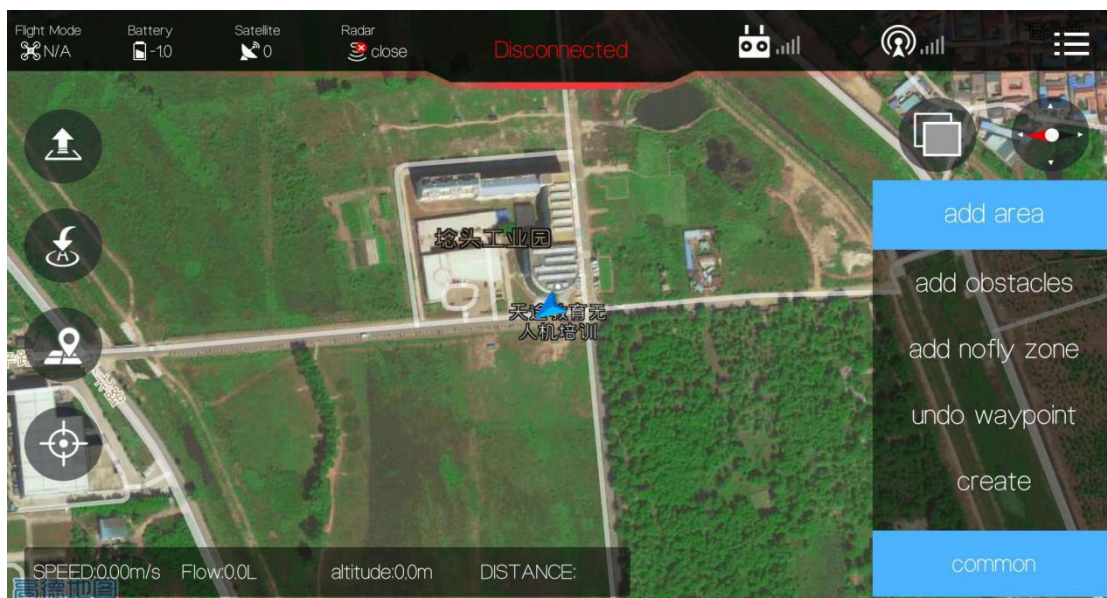
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5.3.3 Drone Point

- 1) Select **Drone Point**
- 2) Click **adding area** to set working area. Obstacles could be added by clicking **add obstacles**.
- 3) Fly drone to the first boundary point, Click "**Common**" to make the first boundary point.
Then the second, third, fourth...





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5.3.4 Route Making

Click “**Create**” to confirm the chosen area and enter into “**Adjust Route**” interface.



Swath:Distance between 2 spraying routes

Obstacle gap: Distance around the obstacle

Target gap: Distance between working area and boundary

Offset: Translation of working area

Save: Save the task

After editing completed, click **Save** to save the task.





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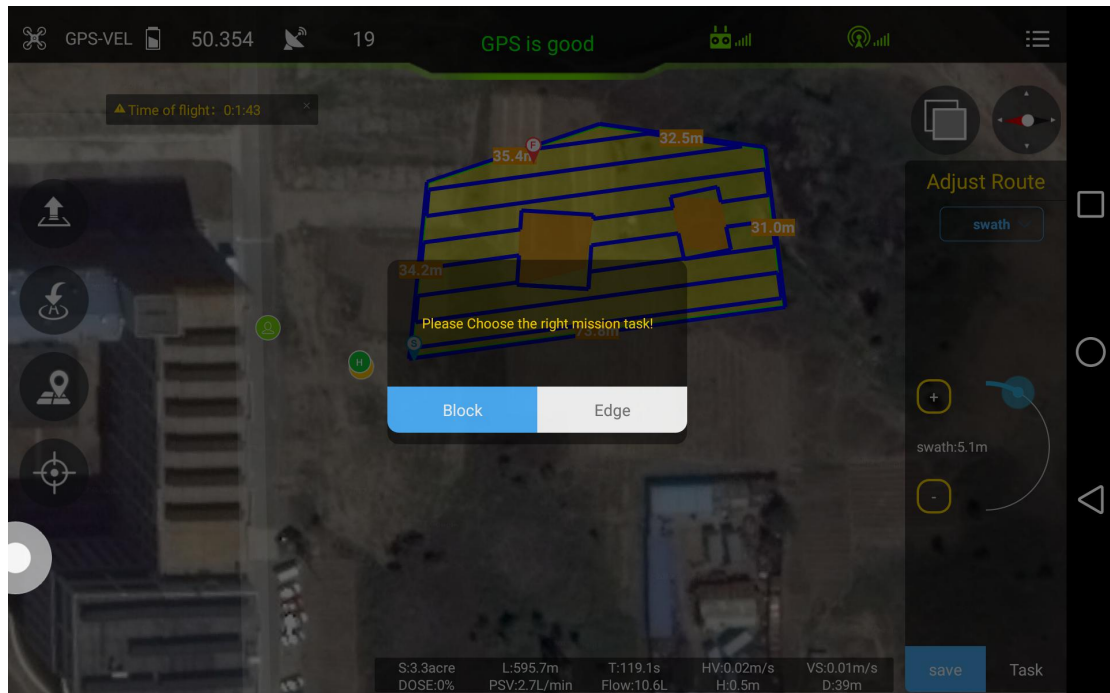
5.3.5 Executing Mission

1) Click **Task** to enter into **Task Management** interface. Click “Send Mission” to upload the task.

Two Mission Task Modes: **Block** and **Edge**.

Block mode: Drone will only fly along the route.


Edge mode: Drone will automatically fly along the boundary line after finishing the route .

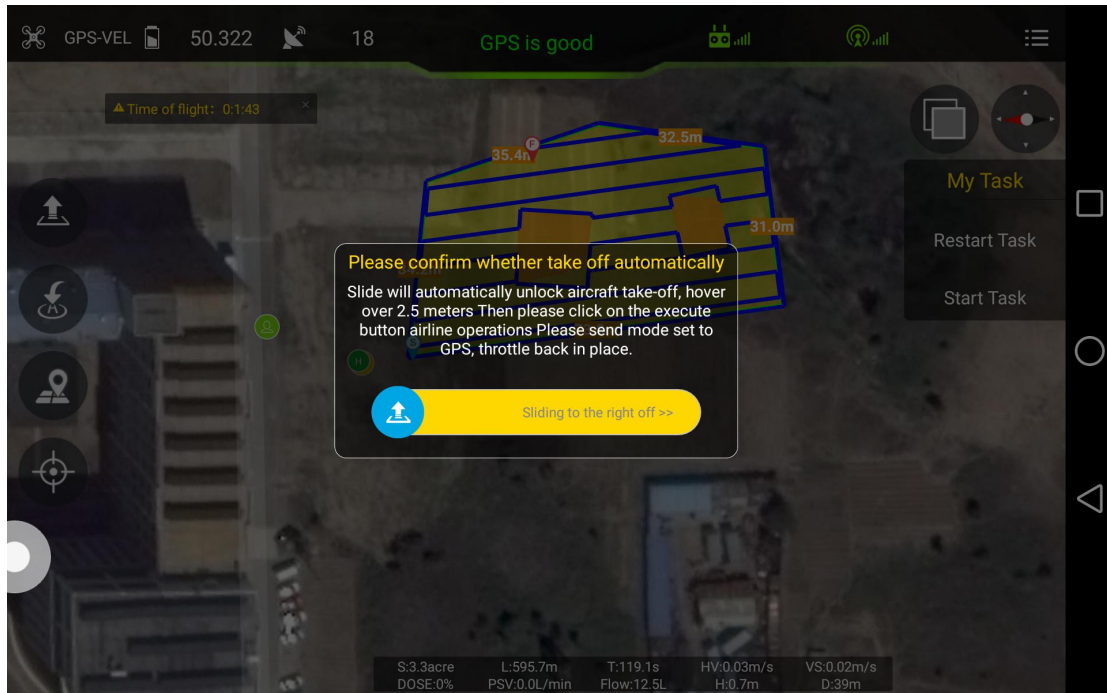




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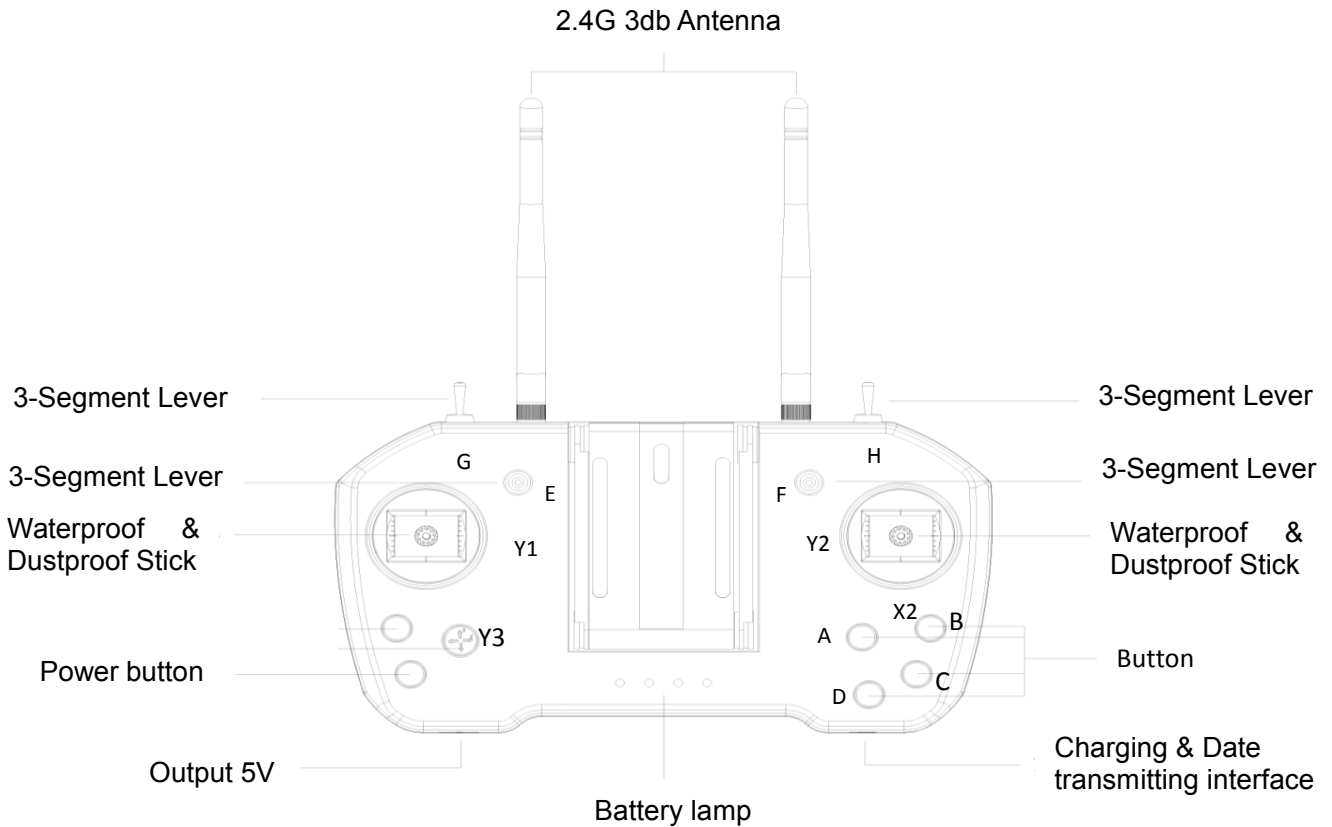
2) Click  to take off from GCS or remote controller,click *start task* to execute the route.



Rudder and **Throttle** could be operated during flying,obstacles could also be avoided by moving the **Aileron** stick.

6. Remote Controller

- ◆ Charger output more than 5V should not be used.
- ◆ Remote controller charging current should be not more than 2A.
- ◆ Any damaged,smoking or abnormal heating charger should not be used.
- ◆ Charging should not be continued in condition of smoking,smelly,weeping.
- ◆ Charging should not be in the area of baby playing.
- ◆ Charging should not at temperature more than 60℃.





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6.1 Function Description

Channel	Top	Middle	Bottom
E: Flying mode	Attitude mode	GPS mode	AB mode
F: AB recording	/	Recording Point A	Recording Point B
Y3: Flow rate	Higher	/	Lower
D: Home landing	OFF	/	ON
Channel	Left	Middle	Right
G: Pump mode	OFF	Combination	Manual
H: Terrain following	ON	/	OFF

6.2 Bind

- ◆ Power on the remote controller first. Power on drone for 1 second and cut off immediately, repeating this step for three times. Then power on the drone for the fourth time and keep the power connection. The drone will enter into binding mode automatically. Drone will bind the remote controller successfully with a voice prompt. **Remote controller need to be calibrated after binding.**

Remark: Binding remote controller can not be operated for more than one pair at the same time. Only one-to-one pairing is allowed.

6.3 RC connection & Device Helper.APP Introduction

1).Turn on remoter controller (short-press + long-press). Open bluetooth, search and connect bluetooth of remote controller (T12-*** , password: 1234).

2).Device Helper introduction.

ADJUST PARAMETERS ----- Adjusting channels, rudder value, fail-safe value.

OTHER OPTIONS ----- Selecting SBUS or PPM output mode of receiver, and telemetry baud rate.

HAND SETTINGS ----- Select hand mode, USA, Japan ect.

UPDATE DEVICE ----- Update firmware online

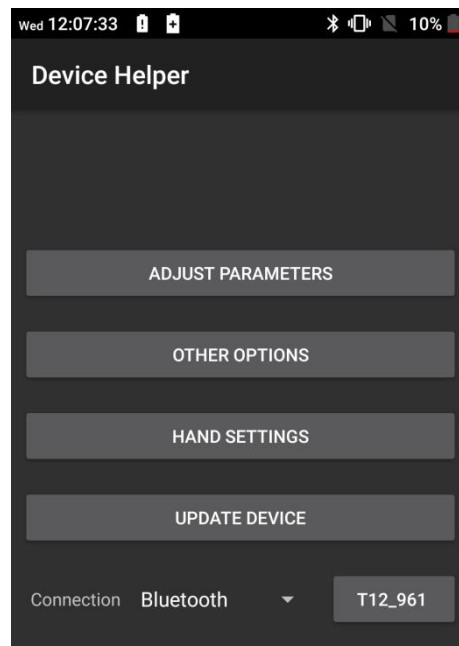
Connection mode ----- Bluetooth mode, SBUS receiver mode.

Cautions: Don't do any adjustment, unless under professional introduction. Otherwise,any consequences caused are undertaken by its users.



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6.4 Video Transmitter Introduction

- 1) Download and install FPV.APK into user's phone. FPV.APK link:
<https://www.ttaviation.org/wp-content/uploads/2019/06/M4EM6E-1M6E-XM8A-Pro-2.45.APK.zip>
- 2) Open OTG function of cellphone to give permission of data transmission. Connect the phone and remoter controller with USB cable. Power on the drone.



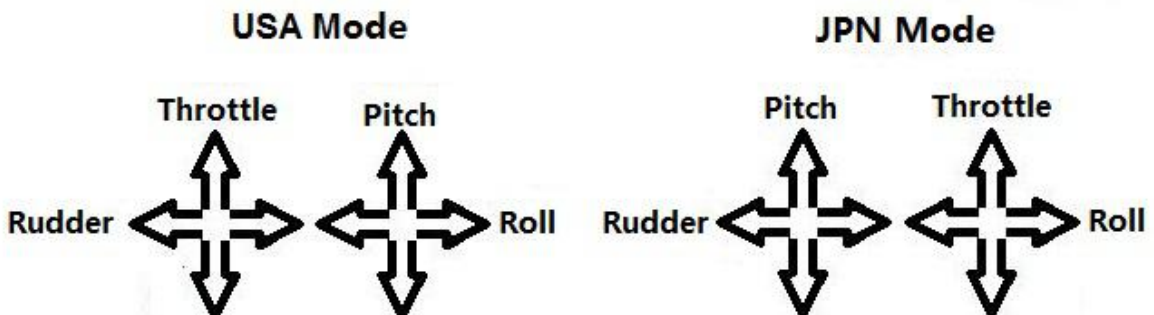
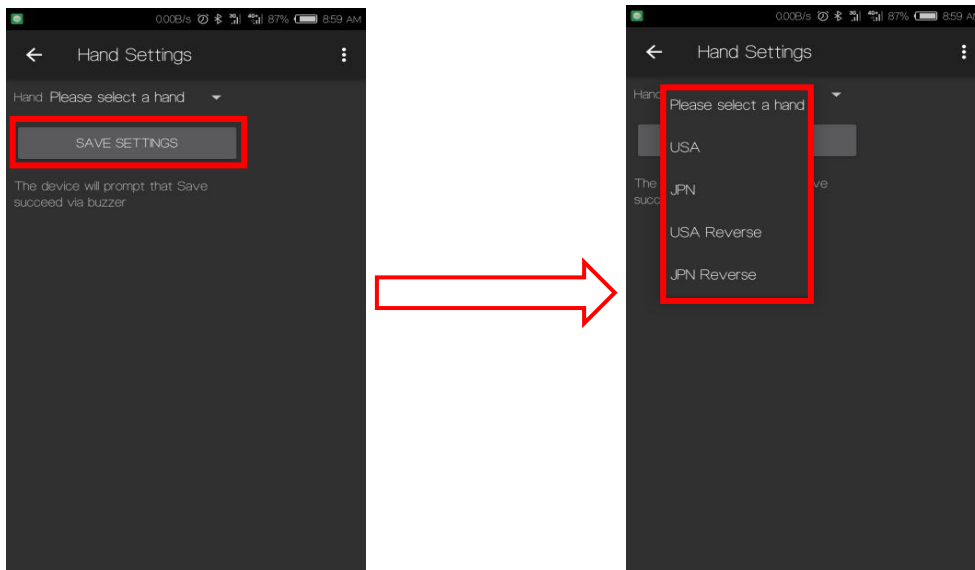
3) Video will be displayed on the phone after user click the ' OK ' option.



6.5 Hand Mode Settings Introduction

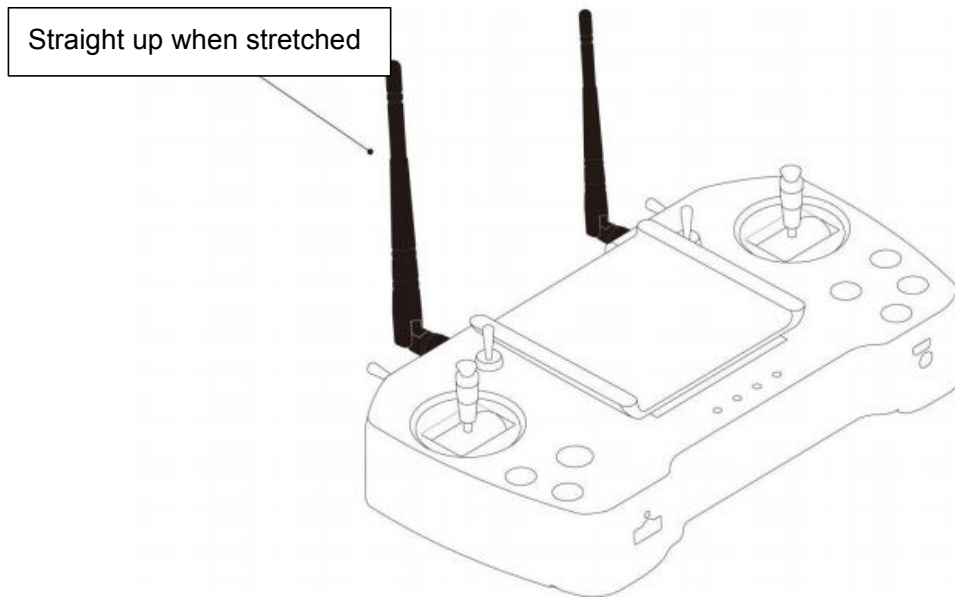
1) Connect user's phone, remote controller and drone

2) Open Device Helper.APP, click HAND SETTINGS and select hand mode: USA or JPN.

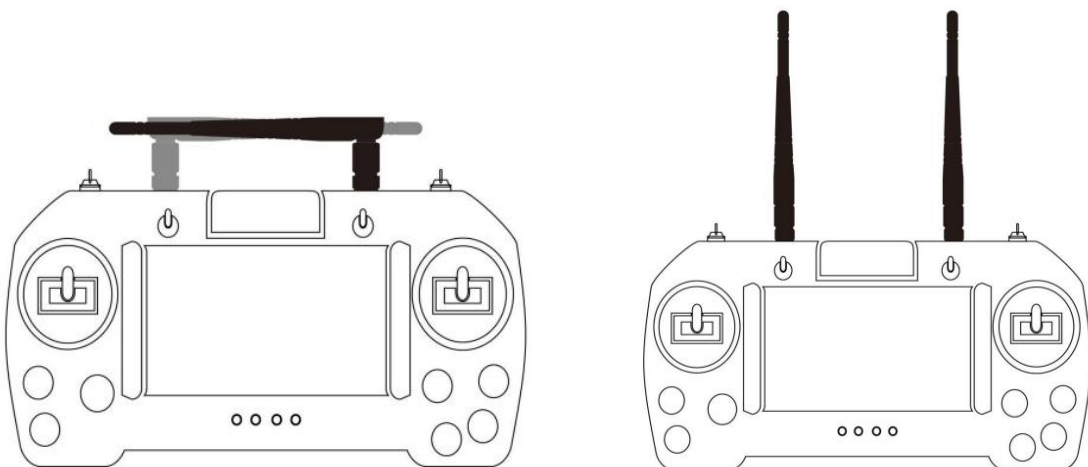


6.6 Remote Controller Antenna

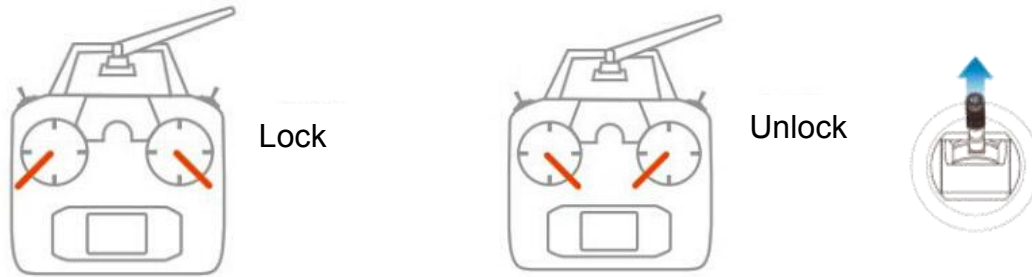
Remote controller antenna should straight up when it is stretched.



Caution: Incorrect directions as the two pictures below.



6.7 Flight Control



- 1) Pull control sticks to the bottom inside corners to unlock drone. **Meanwhile,Keep away from the drone to avoid any injuries.**
- 2) Pull control sticks to the bottom outside corners to lock drone(**only for emergency use**).While flying, this operation can also stop motors immediately).
- 3) After unlocked, push the throttle above the neutral position to make the aircraft take off.
- 4) After unlocked, motor will be stopped and locked automatically if user do not push the throttle above the 10% position from neutral in 3 seconds.
- 5) After landing the aircraft, push the throttle down and hold for 3 seconds. The motors will be stopped.

Cautions:

1. It is suggested to take off in **GPS mode** if satellites is more than 14, no magnetic field interference and all parts of aircraft are in good condition.
2. Before take off, please check the **stick mode** and confirm the current settings is the mode you want. If not, never reset by yourself without the introduction of TTA after-sales engineer.
3. During autonomous mode or AB mode, missions can be **interrupted** by switching the flight mode manually. After that, operator can **fully control** the aircraft.
4. When drone executes protection action such as low-voltage protection and low-liquid protection, operator can **take over control** by switching the flight mode manually if needed.

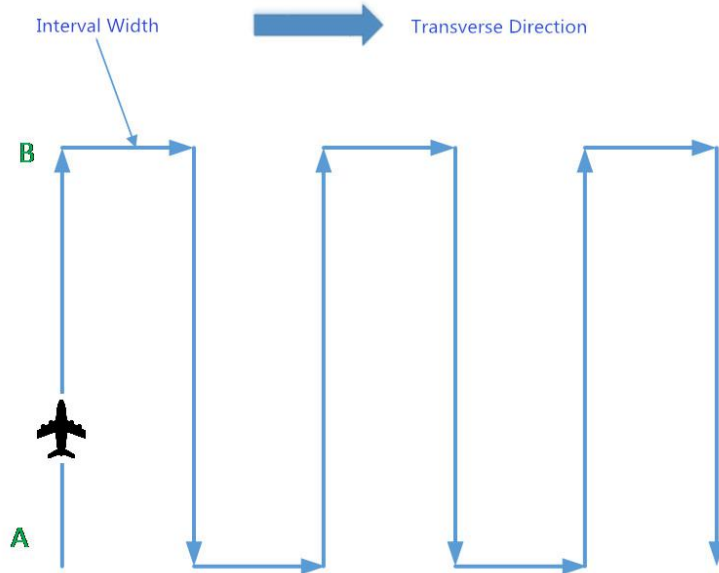


7. Function Control

7.1 Flight Mode

Flight mode	Instruction	Operate	Condition
Altitude mode	Horizontal stabilization,yaw locked,fixed altitude	By transmitter	GPS satellite enough, LED does not flash red
GPS mode	Fixed horizontal point,yaw locked,fixed altitude	Transmitter operation/empty tank reaction/others	GPS satellites enough,LED does not flash red
AB mode	Copter will fly and spray along with AB point	Record point A and B and switch to AB mode,choose left or right for roll	GPS satellites enough, LED does not flash red
Return mode	Copter will fly back home point automatically,flying back tail to home point and then descend slowly, it could be controlled after arriving on the top of home point except throttle	Press button Home continuously/empty tank reaction/low voltage reaction/reaction of losing transmitter signal	GPS satellites enough, LED does not flash red

7.2 AB Mode



AB mode is a more simple efficient mode with fault tolerance to operate. The working theory is above in the picture. Record the point A and B, the UAV will plan the flight line like this.

1. Operate Steps:

- 1) Record the point A, switch the mode to GPS mode. Until the drone self-hovering steadily, switch F to "Point A memorized". After that, the LED flash yellow for 2 seconds. The controller have voice prompt.
- 2) Record the point B, drive the drone to the position you want, **be sure it is at least 10 meters away from point A**. Until the drone self-hovering steadily, switch F to "Point B memorized". After that, the LED flash yellow for 2 seconds. The controller have voice prompt.
- 3) Select the direction, switch E (Flight mode) to AB mode, move the roll joystick to select the roll direction. Move the joystick to the left limitation, the drone rolls to the left side, move the joystick to the right limitation, the drone rolls to the right side. While the drone doing AB point flight mode, the user can stop controlling the joystick. **Make sure the water is enough, the pump is under auto-controlled or manual-controlled.**



4) AB Mode Correction

- ①Altitude correction:Control the flight altitude by the throttle joystick, “up” for the drone to rise, the “down” for the drone to set ;
- ②Correct the the rudder to control the direction;
- ③Adjust point A:while the drone moving from point B to Point A,push up the pitch stick to move point A closer to point B, push down the pitch stick to move point A further away from point B.
- ④Adjust point B:while the drone moving from point A to Point B,push down the pitch stick to move the point B further away from point A,push down the pitch stick to move point B closer to point A.

5) Shut Down and Quit

- ①When set the “no pesticide” action to self-hovering or return,in AB mode this function still works.
- ②When set the “low battery” action to return,in AB mode the this function still works.
- ③After the spraying work is done,AB mode can be shut down by switching into altitude mode.

6) To return to the breakpoint, after broke the AB mode route automatically or manually..
Filling the pesticide in the tank and taking off, then switch SA (flight mode)to AB mode directly ,the drone would return right to the breakpoint.

2. Delete Point A and B

Move stick F (AB recording) for 4-5 times rapidly,LED alternately flash red green and yellow,AB mode dates deleted.**Without deleting last AB point dates, user can not set new AB point.**

3. Set the Interval Width

From the software->Flight parameters to set the spraying width and working speed

Attention:

- 1) Be sure to start AB mode within turning on the pump and agitation function working.
- 2) Be sure it is at least 10 meters away from point A to point be.



- 3) Every time recording point A and B, be sure to wait until the drone self-hovering steadily in GPS mode.
- 4) Without deleting last AB point, can not set new AB point.

8. Mist Module

8.1 Introduction

Mist module is the most cost-effective solution for orchard and high crops spraying services. This module is equipped by Tiannong M6E series products. It combined with features of traditional spraying, greatly improving the efficiency of orchard and high crops, reducing the difficulty of operation, and solving the problem of uneven spraying in traditional methods and difficulty in spraying high crops. Various spraying tests prove that the pest control effect is as high as 97%. It indicates the best performances of this module.

Safety Instruction

- Since the fog machine works in high-concentration smoke pesticides, it is easy to bring corrosive damage to the product. Therefore, after working every day, please clean the fog machine to keep the fog machine dry and no drug residue on the surface.
- Because the outlet hole of smoke machine will have some pesticide precipitation and carbon deposit after long-time working, it is necessary to remove the impurities after 4 hours working to keep the outlet hole clean and smooth.
- Mist module belongs to high-precision electrical and electronic equipment. It should keep away from water strictly to avoid burning caused by short-circuit.
- The combustion chamber
- Mist module works in high-temperature conditions. It is forbidden to touch the combustion chamber unless it has cooled down, so as to prevent unnecessary humanity injury.
- Mist module works in high-temperature conditions. Please use with caution to avoid burns.



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- Butane gas tank contains high-pressure&combustible gas. Avoid squeezing and collision
- When the equipment is not running, please close the high pressure valve of the gas tank to avoid poisoning leakage.

Pesticide Usage

- ◆ All pesticides are poisonous. Please be careful and work strictly referring to the safety instructions of pesticides.
- ◆ When dispensing, please use clear water. If not, will cause jams mesh of impurities. If it is blocked, please clear it before reuse
- ◆ When dispensing , please note that liquid sparks and the pesticide residue in fuselage will be harmful to human body.
- ◆ When dispensing, please pay more attention and use protective tools, and do not let body directly touch with the pesticides; After pesticide spraying, please clear your skin, copter and remote control.
- ◆ When using pesticide, there will be interaction between different pesticides , user should clear cartridge or keep a certain interval time。
- ◆ Spraying shall be carried out in windless sunny day, don't spray under high temperature at noon. While breezing, the operator should be standing above the wind and spraying; do not work when wind is four.
- ◆ When spaying ,if you feel uncomfortable ,headache or dizzy, please leave the site at once and rest. If once severe symptoms occur, immediately be sent to hospital.
- ◆ Pesticide effect and the solution concentration, spray rate ,copter high from crops ,wind direction, wind speed and so on are close related. When using pesticide should consider the above factors, to achieve the best effect. Please make sure that do not damage the human beings and animals and surroundings during the process of sprayings.
- ◆ When using pesticide , do not pollute river and drinking water

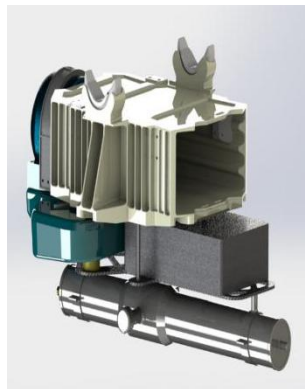
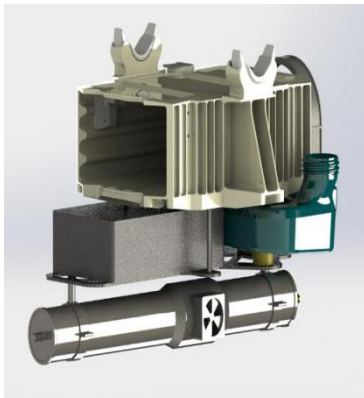


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8.2 Mist Device Parameter

Battery	14000ma/h,intelligent	Effective Spraying Speed	1m/s-3m/s
Hovering Time	Full load≥10min	Max Climbing Speed	5m/s
Spraying Height	2m-4m above crop	Max Landing speed	3m/s
Spraying Range	6m-7m diffuse	Best working Temperature	10~35℃
Spraying Time	20min/L (no dilution)	Tank Volume	3L
Mixed Rate: Chemical liquid/Glycerine	(15~18)/100	Recommended working environment humidity	60%~70%RH
Standard Gas Composition	30% Propane & 70% Isobutane	Gas Endurance	40min-50min/bottle (230g)



8.4 Concise Use Process

- ◆ Check the connection of all fasteners and connectors to avoid any loose possibilities.
- ◆ Check the propellers to avoid any inversions.
- ◆ Check battery capacity of RC, settings of all channels and sticks function.
- ◆ Turn on RC, power on drone and check all flight parameters to ensure all parts work well.
- ◆ Check the fan of mist device to ensure it works properly.
- ◆ Check the pump to ensure it works properly.
- ◆ Check the connection of tubes to avoid any leakage and looseness.
- ◆ Power on the pump and make sure it works well. Open the high pressure valve of gas tank.Then push the ignition switch to ignite the gas. After igniting properly, keep away from the combustion chamber.



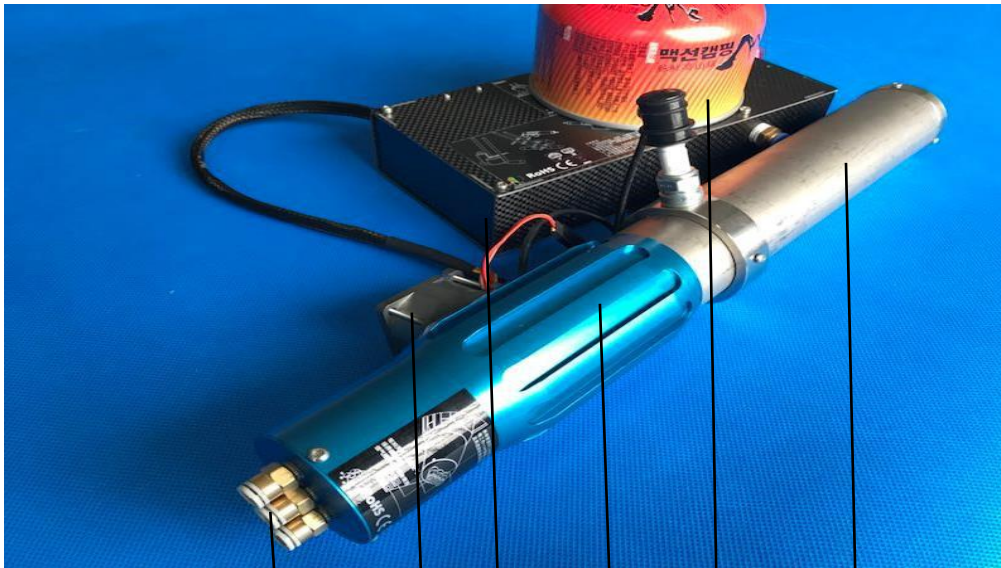
8.5 Remote Controller of mist device



Ignite button

Pump switch button

8.6 Assembly Diagram



A

B

C

D

E

F

A : Butane inlet

B : Fan

C : Circuit control box

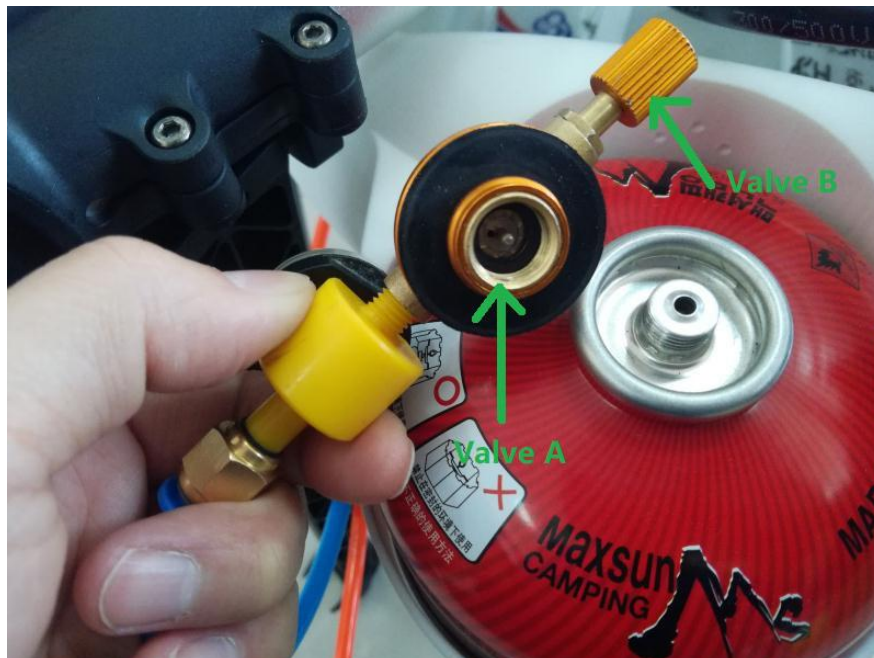
D : Heat sink

E:Butane bottle

F : Main heating sector



8.7 Using Instruction



- (1) Tighten the Gas tank to the valve A(counterclockwise), make sure there is no loose between the tank and valve.
- (2) Inject the drug liquid into the drug cabinet and press button B to let the liquid



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enter into the mist device. Adjust the flowrate to make liquid flow out of the nozzle in droplet status, then press button B again to close the pump.

(3) Rotate the valve B counterclockwise and observe the pressure meter, stop rotating when the value reaches at 0.3~0.4Mpa.

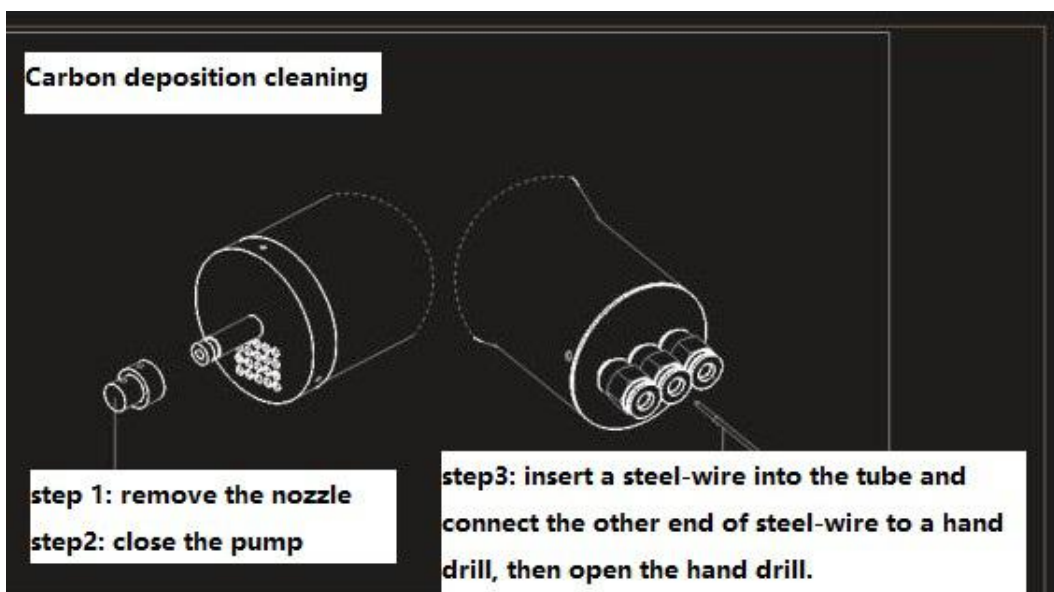
(4) Press button A, then there will be sound of gas entering the mist device. Release button A.

(5) Rotate the valve B counterclockwise for more 5 ° quickly.Press Button A once again and wait for approximate 2 seconds. Some current sound of spark plug will be heard, then the gas in the mist device will be ignited and burn stably

(6) 5 seconds after the gas burning stably, press button B to open the pump to let the drug liquid enter into the mist device.

(7) The fog will increase with the rising of temperature of mist device to final stable status.

(8) The mist device should be fully cooled down before power off. ①Firstly close the valve B to cut off the gas supply. ②Secondly do not close the pump until there is not any fog exist, ③Keep the fan working for additional 5 minutes ,then shut down the power of mist device.





Appendix I Key Parts Maintenance

1.Propellers

(1) Blades of propeller should keep intact. If there are any cracks or missing parts, the propeller should be replaced.

(2) Tightness of all the blades should be suitable and be similar. Replace the propeller gaskets/washer with new ones when blades cannot spin smoothly.

(3) Blades should be folded well and be held by the blade holder or belts after flight, and should be released and put straight before take off.

2.Motors

(1) Motors should be or be suggested to be replaced:

(2) Before the rotor clearance get loose or running after 3000 hours.

(3) The rotor movement get blocked.

3.ESC should be or be suggested to be replaced:

(1) When Esc output obviously different from other ones.

(2) Damaged in crash

4.Flight Controller should be or be suggested to be replaced:

(1) When IMU is not able to be calibrated to normal.

(2) When the I/O ports is not capable to communicate with other devices on drone as normal as before.



Appendix II Implication of Indicator Light

Items	Indicator light	Priority
Flying Mode		
Gyro mode(stabilization,attitude)	Green light single flash ●	Low
GPS mode (angle,speed)	Green light double flash ●●	Low
AB mode	Green light triple flash ●●●	Low
GPS		
GPS unconnected/GPS receive no satellite	Red light triple flash ●●●	Low
GPS bad signal	Red light double flash ●●	Low
GPS general signal	Red light single flash ●	Low
GPS Good signal	Red light off ○	Low
Low Voltage Warn(alarm)		
First alarm level	Yellow light triple flash ●●●	Low
Second alarm level	Yellow light quick flash ●●●●●	High
Compass Calibration		
Horizontal calibration	Yellow light constant light ● ———	Middle
Vertical calibration	Green light constant light ● ———	Middle
Calibration failed	Red light constant light ● ———	Middle
Calibration succeed	Red,green and yellow light alternating flash ●●●	Middle
Accelerator Calibration		
Calibrating	Red,green and yellow light alternating flash ●●●	Middle
Calibration succeed	Green light constant light ● ———	Middle
Error		
Remote controller lose control	Red light quick flash ●●●●●	High
Compass interfered/error	Yellow and green light alternating flash ●●●●	High
GPS lose satellite/error	Red and green light alternating flash ●●●●	High
IMU over vibration/error	Red and yellow light alternating flash ●●●●	High
Other Situations		
Initializtion of power on	Red,green and yellow light alternating flash ●●●	High
Unlock	Red,green and yellow light alternating flash ●●●	High
Unlock failed	Red light constant light ● ———	High

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