

# User manual for DF-T2

V2.0

Shenzhen Dingfeng Unlimited Electronics Co., Ltd.

## 1. Safety warning:

- 1.1-Be careful when using the drone, regularly check the batteries, motors, paddles, and so on. Check the screws if they loose or not, because the high frequency vibration may make them loose. DO NOT use battery that bloated.
- 1.2-DO NOT dismantle the drone arbitrarily.
- 1.3-DO NOT dismantle, burn, hit or press the batteries, please keep them away from kids where is cool.

## 2. Main function & parameters

Mode	DF-T2
Size (Excluding Propellers)	120*120*50CM
Fold size	45*45*50CM
Max take-off weigh	26kg
Pesticides load	10kg
Control distance	1000-1500M
Flight speed	3~6M/S
Max flight height(adjustable)	500M
Flight time(unloaded)	18-25mins
Working time (loaded)	13-17mins
Flight mode	Manual/GPS/Auto
Operating temperature	0~50°C
G. W. (without batteries)	9.5Kg
Spray rod length	100CM
Spray width	3~6M
Working speed	3~6m/s
Work efficiency	4-8 Ha/h
Working height	1.2~4M above the crop
Daily average spray area	24 Ha/day(6 hours)
Spray flow	1.4~1.8L/min

### 3. Packing list

DF-T2 packing list	Amount
Six-rotor drone fuselage	x1 piece
22 inch carbon fiber propeller	x3 pairs
remote controller	x1 piece
funnel	x1 piece
tool	x1 set
storage box	x1 piece
30A dual interface balanced charger	x1 piece

### 4. Disclaimer

Thank you for choosing SINOCHIP. This is an excellent pesticide spraying agriculture drone, please do comply with the operation rules on this manual. Do take off the propellers when install and test, avoid the risk of being hurt. This is not toy drone, anyone who is not over 18-year-old should not be allowed to use it. Once you use our drone, it signifies that you are clear about this statement, users should take the responsibility for any lost in wrong remodeling and operation.

Exemption clause ( 免责条款 )

- 4.1 This is a special item, users will be fully responsible for any result caused in using this item. .
- 4.2 When violate the public order or endangering public safety, users should take the legal responsibility.
- 4.3 Sinochip will not take responsibility for lost directly/indirectly caused by the following reason:
  - 1) Get this product in illegal way;
  - 2) Disassemble or remodel by oneself;
- 4.4 Warnings
  - 1) Pls do not use this product in bad weather like raining or when the wind is over level 4.
  - 2) Do take off the propellers when install and test, avoid the risk of being hurt.

- 3) The order to switch on/off drone:  
Turn on the remote control before flying, and then power on the drone.  
Shutdown the drone power first after landing, then turn off the remote control.
- 4) Keep the throttle in more than 10% during the flight.  
Do not turn off the controller after the drone is powered on or flying!
- 5) Please land the drone if the battery voltage is too low.
- 6) Forbidden to fly in the no-fly zone, strong magnetic, high-voltage wires, wireless base stations, radio interference and other familiar zones.
- 7) Do not overload in the flight, no drum battery nor damaged propeller should be used in the flight.
- 8) Do not fly in densely populated areas.
- 9) In flight near tall buildings may affect GPS signal strength.

## 5. Operation method

### 5.1 Safety precautions

- 1) Turn the power on and off in the correct sequence;
- 2) Please place in a flat place for take-off and landing;
- 3) Keep at least 10 meters away from the drone when take off and land, NEVER in the crowd.
- 4) Check if the arm and propeller connections are tightened before takeoff.

### 5.2 Preparation before take off

#### Pre-flight security checks

- 1) Check the battery, 6S battery full voltage is about 25.2V. Check the battery surface if it is damaged, or the drum package plug is loose. Check the remote controller, battery full voltage is about 12.6V, please charge it if less than 11.1V.
- 2) Open the arms and make sure they are locked tight, set the propellers to the motors by A/B to A/B, make sure lock tight. damaged propellers must not be used!
- 3) Make sure the GPS module is in the right direction and tight. The arrow direction of the GPS module should be the direction of the flight (the LED light is in the tail direction).
- 4) The remote controller has been set to the model type to: Multi-rotor. Turn on the remote controller and check if the model displayed on the screen is multi-rotor. Switching to the other models will cause the drone to fail to start or run out of control.
- 5) Make sure the joysticks and switch of the remote controller are at the bottom position.
- 6) Tie the batteries tight with straps.
- 7) Fill the liquid through a funnel into the tank, try best to avoid liquid spilling on the fuselage or battery plugs.
- 8) **!Be sure to calibrate the electronic compass and Level calibration. Refer to sections 6.1 and 6.2.**

### 5.3 Flight operation method

1) As shown in figure 5-3:

On the remote controller, throttle and direction (lift and steering) is on the left side, direction left/right/forward/back-off on the right side. Switch G is for the spray control, and C is for flight mode.

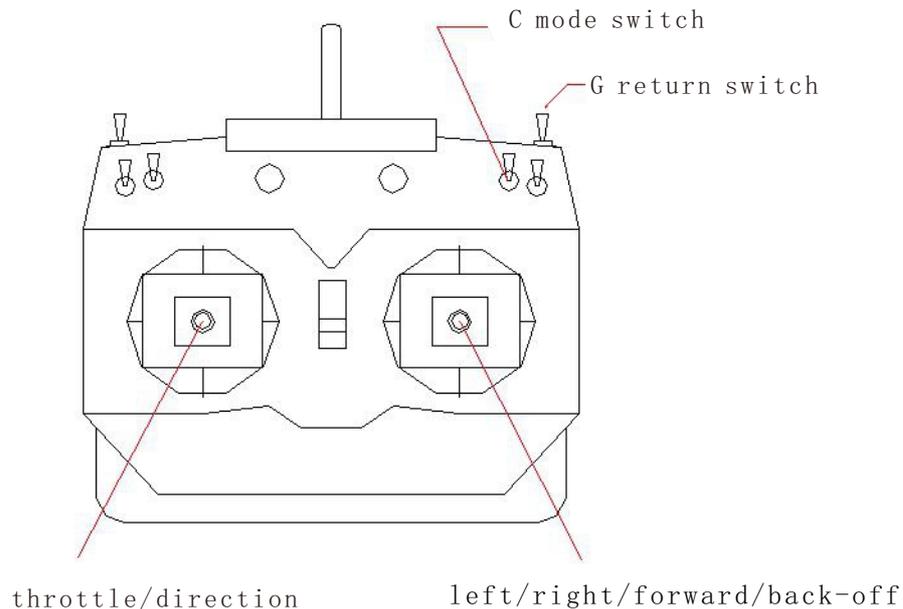


Figure 5-3

2) Place the drone on flat ground and follow the correct start sequence: turn on the remote controller, make sure the throttle stick at the bottom position, then connect the power battery to the main power plug.

3) When the drone is powered on, set the flight mode to GPS mode. Please stay at the safety distance and pay attention to the LED status, the LED flashes alternately by red and green, ONLY when it turns to purple and green lights flash can the drone take-off.

4) Take-off in GPS mode:

After pull the drawbar as shown in Figure, the motor will unlock and rotate in low speed, slowly pushing the throttle more than 50%, the drone will take-off vertically, do not push to the top, when to 2-3 meters height pull back to 50%, the drone will maintain the current altitude and hover.

Note: If the throttle is less than 10% after unlocking, the motor will stop and lock automatically, the motor will be locked immediately if pull to the position as Figure 6-1.

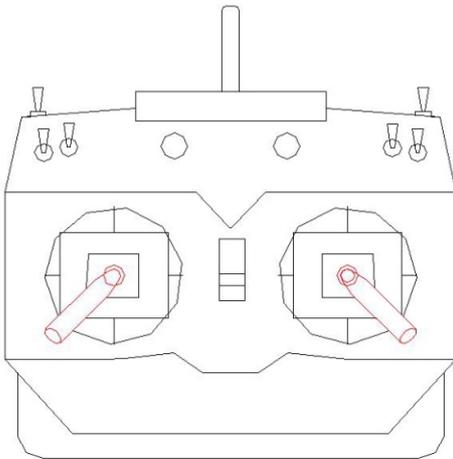


Figure 6-1 lock the motors

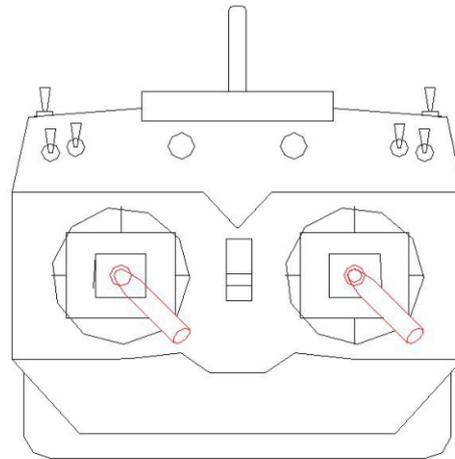


Figure 6-2 unlock the motors

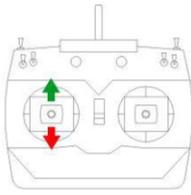
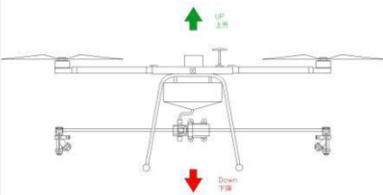
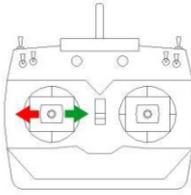
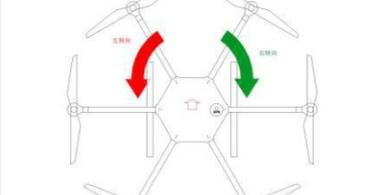
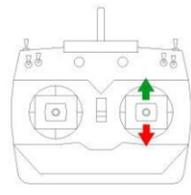
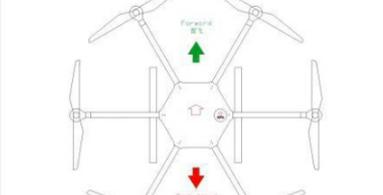
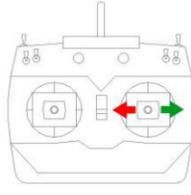
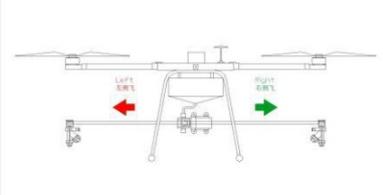
5) Land:

Please land the drone to a flat place, control the rate of decline, slow down, preventing the rapidly dropping damaged the drone.

6) Flight

Flight mode switch (SW-C)		Description
 A-attitude mode		Pull C switch to position (A), attitude flight mode, can not be set high nor fixed point. When the return switch is in the neutral position (B), it will start to spray.
 B-spray mode		Pull C switch to position (B), spray mode, the drone will uniform spray in set maximum speed.
 C-GPS mode		Pull C switch to position (C), fixed high-point automatic hover mode, it will spray when the return switch pulled to the neutral position (B).
Return switch (SW-G)		Description
 A-Normal flight		No function
 B-Spray on		Pull G switch to position (B), Activate the spray function under flight mode GPS mode or attitude mode. When under operation mode cut G switch to position (A).
 C-Return on		Cut G switch to position (C), the drone will return. And the drone will stop returning if G switch leave position (C).

Flight direction diagram:

Controller (US)	flight direction	operation method
		<ol style="list-style-type: none"> <li>1. Throttle stick pushed upward, drone rise.</li> <li>2. Throttle stick pushed down, drone drop.</li> <li>3. Keep the throttle stick still when the drone reaches desired altitude and the drone will hover at that altitude. Push the throttle to slow, to prevent the drone rise too fast, or drop too fast.</li> </ol>
		<ol style="list-style-type: none"> <li>1. Throttle stick pushed left, drone anticlockwise rotate.</li> <li>2. Throttle stick pushed right, drone clockwise rotate.</li> </ol>
		<ol style="list-style-type: none"> <li>1. Steering rod pushed forward, drone move forward.</li> <li>2. Steering rod pushed back, drone move back.</li> </ol>
		<ol style="list-style-type: none"> <li>1. Steering rod pushed left, drone move left.</li> <li>2. Steering rod pushed right, drone move right.</li> </ol>

When the drone is lost control, it will automatically increase the flight height to 10 meters, stay for 5 seconds and then fly back to take-off point, at this time please stay away from the take-off point, when the remote control signal recover, the drone will automatically exit the uncontrolled Return State and switch to the current flight mode state.

**If you find that the drone is unstable or is disturbed, switch the flight mode from GPS mode to attitude mode immediately and pay attentions to the throttle to prevent high-speed crash.**

## 5.4 Flight training steps.

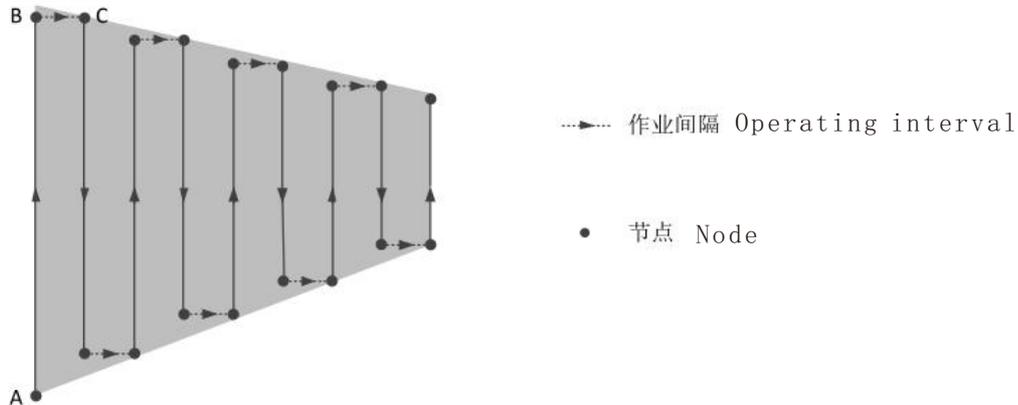
Make sure to keep a safe distance with the drone!

- 1) Practice take-off and landing: put the drone on flat ground, face to the LED on the drone, keep at least 10 meters away from it, takeoff and landing repeatedly.
- 2) Practice forward and back off: when the drone can stably takeoff and land, fly it to 3 meter height, slowly fly it forward for about 15 meters, and then fly back to the point. You can fly further if skilled.
- 3) Practice left and right: stand behind the drone, keep 3 meters height and slowly fly it left for about 10 meters and then back right to the point. You can fly further if skilled.
- 4) Practice steering: stand behind the drone, keep 3 meters height, and slightly pull the left rocker to left side, the drone will anticlockwise rotate, release the rocker back to the median, drone stop rotate. Then slightly pull the left rocker to right side, the drone will clockwise rotate. Keep practicing till skilled.
- 5) Practice flying square shape: after the four previous steps, practice to fly in a square shape, keep the square in side length of about 20 meters and fly clockwise, and then anticlockwise.

## 5.5 Spray

Switch to GPS mode, load pesticide, takeoff to the right height, switch to spray mode when it close to crop. Fly uniformly to the end and then move right to the new route, pull and fly back off uniformly, keep going like this. The drone will hover when pesticide use up because there is a liquid sensor on the drone. in this case, please cut switch G to return mode and then fly back to reload pesticide and start for the second spray if battery power allows. ONLY cut switch G to return mode can the drone record the position where pesticide used up.

**REMARK:** Do not over-discharge the battery in case it might be damaged. And please in uniform speed and fix height when spraying.



In this figure, (A) is the position to start spraying, the drone receive signal and fly forward at position (A), get signal to move right at (B) and back off at (C). spray in this mode can improve work efficiency and adapt to irregular spray areas.

Operation process

Make sure the drone stay in your view sight when spraying.

Make sure cut to spray mode.

**Step 1).** Take off the drone and set it hover at height 1-2 meter above the crop.

# If the drone does not record the coordinate where pesticide used up, please push the throttle to 50% of the position and take off.

# If the drone has recorded the coordinate, please push the throttle to 60% of the position and then 50%, the drone will automatically go back to the coordinates and continue spraying.

**Step 2).** Move forward and the drone will spray in constant flow with fixed height and speed.

The drone provides the intelligent spray flow function, flow rate associated with the flight speed: the faster drone fly, the greater flow rate. The pump will automatically shut down when the speed below 0.5 m/s.

**Step 3).** When the drone fly to the node, move left / right and the drone will go through operating interval and hover. Move forward / backward, the will fly accordingly and start spraying. Release the joystick, the drone will and stop spraying.

Operating interval is the same with spray width, it can be programmed.

The drone will spray when flying, and stop spray when hover.

**Step 4).** repeat step 2-3 to finish spraying job.

Breakpoint continued spray function (if equipped with liquid sensor)

In the following cases, the drone will automatically rise during spraying to specific height and hover in the course of the operation will rise to the specified height, and hover.

1) Pesticide below alert line, the LED will flash four times in BLUE color, and the pump will close.

2) The drone get signal to fly back.

You can take the follow steps to get breakpoint continued spray function:

**Step 1).** Cut SW-G to return on position, the drone will record the coordinate as breakpoint,

fly up to the specific height and straightly fly back to the HOME point (where you start the drone at first beginning).

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**Step 2).** Takeoff after reload pesticide or recharge the batteries:

If the drone does not record the coordinate where pesticide used up, please push the throttle to 50% of the position and take off.

If the drone has recorded the coordinate, please push the throttle to 60% of the position and then 50%, the drone will automatically go back to the coordinates and continue spraying.

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**One key return:**

Under any flight mode, the drone can fly back in One-key-return function as long as the GPS signal is good. Once star this function, if the current height is less than 10 meters, the drone will rise to the specific height, and fly back to the HOME coordinate, and then LED flash once in green ● color and then twice quick in green ● color; after arrive above the start position, the drone will hover for 5 seconds and then land, LED flash once in green ● and once in purple ●. After landing, the system will automatically confirm weather land safely, once confirm, the motors will automatically lock. During the flight to the HOME coordinate, you can control the direction, but cannot fly up/down/left/right.

During landing from the HOME coordinate, you can fly up/down/left/right and control the direction.

**Low voltage protection (12S high voltage power is not supported)**

You can set the low-voltage protection trigger threshold in the parameter adjustment software. The trigger threshold is battery voltage when drone is loaded. Therefore, when low-voltage protection work, the measured voltage of the battery after the drone landed will generally be higher than the trigger voltage you set. There are two levels for this function. In level one, the LED will continuously flash in yellow ● color; In level two, the LED will continuously flash in red ● color. If the low-voltage protection switch is turned on, the drone will land directly at the current position and then lock.

## 5.6 Charging method

- 1) Connect the battery, balance charger and charger together, connect the charger to Alternating Current (AC), then press the START button, the balance charger will show the battery type. Press the START button to start charging, the voltage should be 25.2V when fully charged.
- 2) Please check the battery before flying. Connect the battery to voltage detector, the detector will ring once when connected if the battery is powerful. But if the battery is in low power, the detector will keep ring.

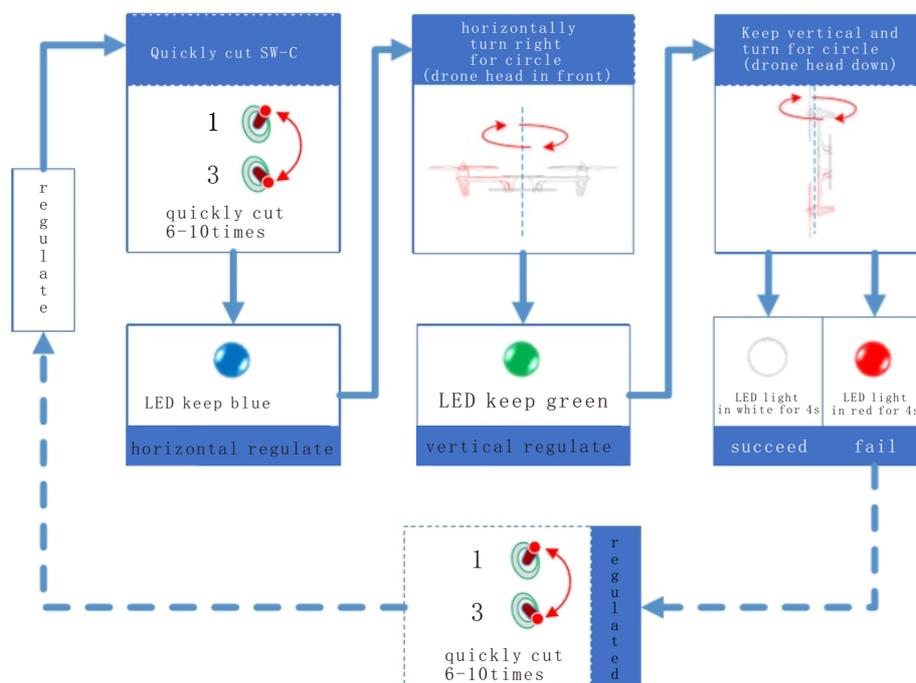
\*Please check whether the socket loose or deformed, if loose or deformed, please fix it to the right shape; please make sure the battery voltage not less than 22V.

**Battery storage:** The battery must be discharge in 12 hours after fully charge, or battery life might be damaged. Store the battery at cool place and no inflammable materials around. Please check the voltage after days, and if the voltage is lower than 22.2V, please charge it to 23.5V.

## 6. Common malfunctions

### 6.1 Compass fault status and solution

LED alternately bright in green and yellow indicates that electronic compass over deviation, need to be regulated in following way:



### 6.2 Horizontal regulate

Put the drone on flat land, keep action like figure 6-1 for more than 10 seconds, release the lever when LED start to alternately bright in green and blue. After about 10 seconds, LED only flash in blue, after 5 more seconds, the LED will normally flash. If the drone keep deviate direction, please do horizontal regulate.

### 6.2 The drone shakes strongly after take-off

Please land the drone immediately if it shakes strongly. Check if there is any debris on the propellers. Debris will make the drone shake in high frequency vibration and even crash. DO NOT use any damaged propellers.

If propellers are good, pls confirm:

A-battery tied tight at the center position.

B-all connector and screw are in good condition.

### 6.3 Common malfunction of the spray system:

1. hear the bump working but not spray: Unscrew the bleed valve of the nozzle, and open the water pump, the air inside emptying and the nozzle will work again. Close the water pump switch and tighten the bleed valve.
2. Water leakage at the connector: PU tube is not inserted to the right position, please re-tighten it.
3. No respond when open the pump switch: check if the power wire is loose, if not, connect the pump with a 12V battery, if the pump function well, then replace the electronic switch on remote controller.
4. Please clean the spray system after spraying, do not put any liquid with impurities or solid inside to prevent clogging.

### 6.5 Implication for LED light:

LED color	Implication
 (2)  (1)	Satellite signal is too weak to locate.
	Satellite signal is good, GPS located.
 	Attitude mode, satellite signal is good.
 	Spray mode, satellite signal is good.
 	GPS mode, satellite signal is good.
	IMU/Barometer abnormal, pls power off and then on
  (∞)	Compass over deviation, need to be regulated.
  (∞)	The receiver lost signal.
 (∞)	Low-voltage alert level 1.
 (∞)	Low-voltage alert level 2.
 (10)	Return coordinate record
 (4)	There is breakpoint memory, you can toggle the flight mode switch for 4 times to clear.

 (∞) “∞” means keep flashing.

 (N) mean  LED flash in this color for N times.

### After - sales service card

Basic information:			
Company/person:		Contact No. :	
Express No. :		QQ or Wechat:	
Recipient add. :			
Rework product information:			
Product name:			
Parts list:			
Malfunction:			
Rework report:			
Repair staff:		Date:	