BETAFPV

Cetus

FPV KIT

User Manual

Contents

1.Product List

1 x Cetus Brushed Whoop Quadcopter
1 x LiteRadio 2 SE Radio Transmitter
1 x BETAFPV VR02 FPV Goggles

Box Contents

2 x BT2.0 300mAh 1S Lipo Battery
1 x BT2.0 Battery Charger and Voltage Tester
1 x USB Charging Cable (Type-C)
1 x Type-C to FC Adapter
1 x Prop Removal Tool
4 x 31mm 4-Blade Prop(Replacement)
1 x Portable Storage Bag

2.Operation Manual

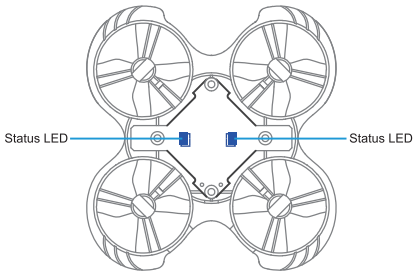
2.1 Preflight Checks

1. Verify that all components are included, without damage.
2. Verify that propellers and motors are installed correctly.
3. Ensure propellers do not scratch against frame ducts and motors spin smoothly.
4. Verify batteries (of quadcopter, remote control radio transmitter, and FPV goggles) are fully charged.
5. Be sure pilot is familiar with all flight controls. (Find "Remote Control Radio Transmitter ").
6. Always keep a safe distance in all directions around the quadcopter to avoid collisions. Operate the quadcopter in open space, away from people and traffic.

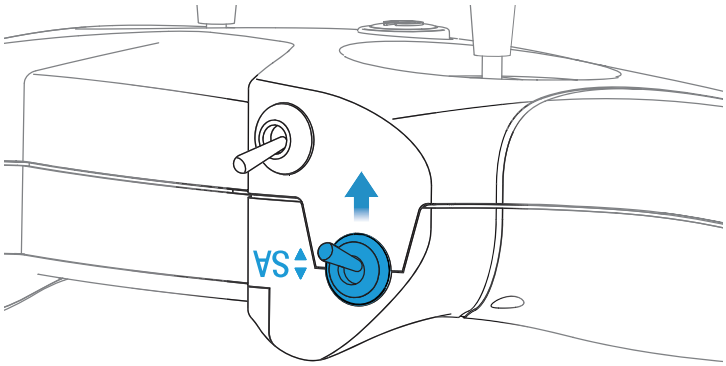
2.2 Quick Start

Before flying, verify that remote control radio transmitter is successfully connected to the quadcopter, all basic controls are functional, and that the quadcopter can take off normally.

● Step 1: On the remote control radio transmitter, set the "throttle" joystick and four switches to the lowest setting, throttle is the lowest when pointed toward you, and the other switches are the lowest when pointing toward the ground. Long press the power button on remote control radio transmitter for 5 seconds until it beeps three times, then release. The remote control radio transmitter power indicator will quickly flash red, then remain blue.
● Step 2: Install the battery into the battery mounting slot under the quadcopter. Connect the battery cable between quadcopter and battery, then place the quadcopter on a level floor. Wait 2-3 seconds until its status LED lights remain blue.



● Step 3: Move switch SA up to arm the quadcopter. The throttle joystick must be at the lowest position or the quadcopter will not arm. The motors will spin slowly. Move switch SA down to disarm the quadcopter or before trying to arm again if arming did not succeed.

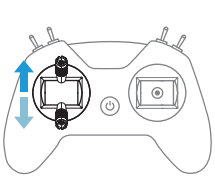


Push Up to Arm the Quadcopter

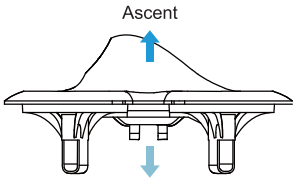
These steps verify the quadcopter and remote control radio transmitter are working. Proceed with flight operation.

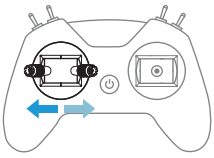
2.3 Flight Operation

● Step 4: Re-arm quadcopter (step 3). Motors will spin at a low speed.
Throttle (left) Joystick:
● Up/down controls rate of ascent/ descent.
● Left/Right controls counterclockwise/ clockwise rotation (yaw).

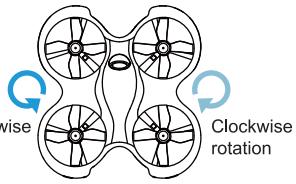


Joystick up/down

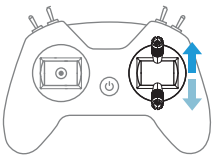




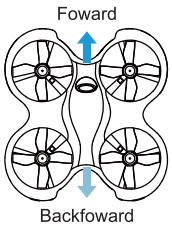
Joystick left/right

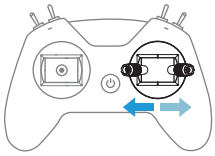


Direction (right) Joystick:
● Up/down controls forward/ backward tilt angle (pitch).
● Left/right controls left/ right tilt angle (roll).

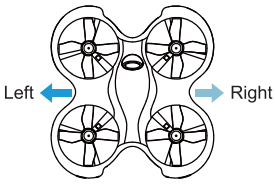


Joystick up/down





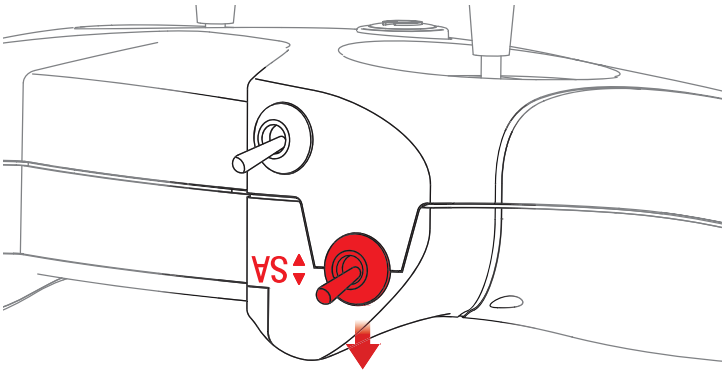
Joystick left/right



Before flying with goggles, it is recommended to practice and become familiar with the controls and sensitivity of the joysticks by standing behind the quadcopter and hovering in front of you.

Caution:
1. Find a suitable area for flight.
2. Push the joysticks slowly, especially the throttle joystick.
3. Disarm the quadcopter (push switch SA down) quickly if the quadcopter becomes out of control or collides with objects.

● Step 5: Land quadcopter steadily and keep it disarmed. Disarming will stop the propellers immediately.



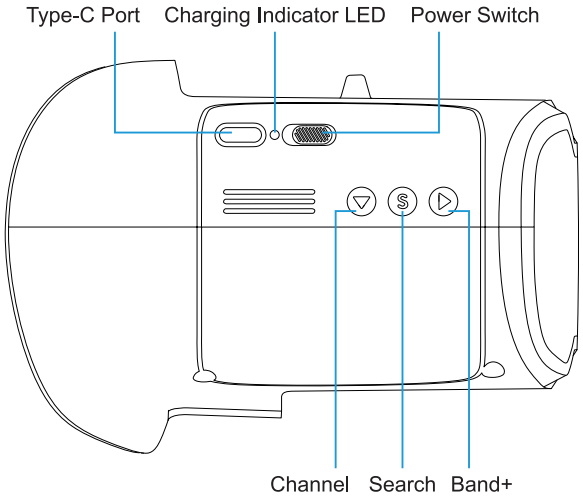
Push Down to Disarm the Quadcopter

● Step 6: Disconnect and remove the battery from the quadcopter. A long press of the power button on the remote control radio transmitter will turn it off after three beeps.

2.4 First Person View (FPV)

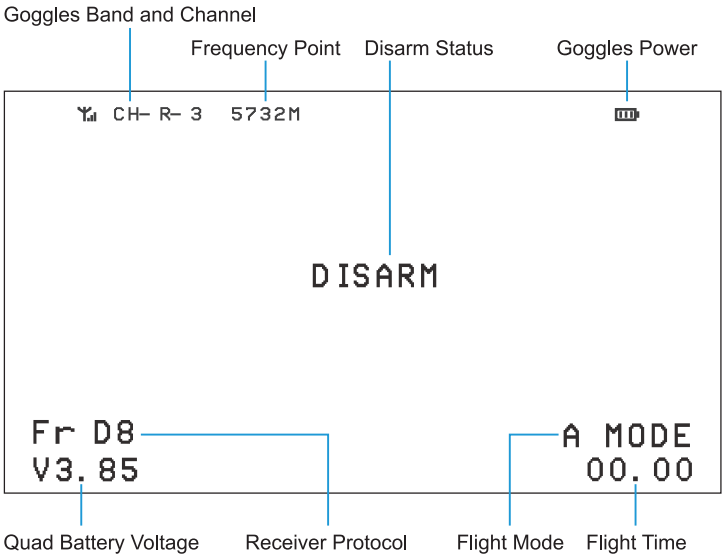
First-person view (FPV) is the real-time transmission of the camera image to FPV goggles.

● Take out the goggles, install the headband.
● Slide the power switch to the right. The screen lights up and the VR02 goggles turn on.
● Long press the "S" button for 1 second to enable fast frequency search. After 3 seconds, a beep will sound and the corresponding FPV cross-machine screen is displayed in the goggles, indicating that the frequency search is complete.



2.5 On-Screen Display (OSD)

After band search, flight information is shown on the display along with the FPV image. This information is called On-screen Display (OSD)



2.6 OSD Information

● Goggles band and channel, frequency, and goggles power level are shown at the top of the screen.

● The flight status of the quadcopter is displayed in the center, DISARM means locked status, LOW VOL means the quadcopter battery voltage is low, and RX LOSS means the quadcopter cannot communicate with the radio transmitter (control of the quadcopter is lost).

● Receiver protocol, quadcopter battery voltage, flight mode, and flight time are shown at the bottom of the screen.

2.7 Flight Modes

The flight mode is displayed in the lower right corner of the flight screen, corresponding to the flight mode of quadcopter. Pilots can choose different flight modes according to different flight environments and their own flight control skills.

1. Adaption mode: The quadcopter maintains a horizontal attitude at a fixed point when two joysticks are centered at the same time. The quadcopter will automatically adjust the flight height according to the terrain. This mode is suitable for simple terrain. A MODE is displayed in the OSD.
2. Normal mode: The quadcopter maintains a fixed altitude in a horizontal attitude when two joysticks are centered at the same time. The altitude during flight needs to be flown. It is controlled by the throttle joystick. This mode is suitable for complex terrain. N MODE is displayed in the OSD.
3. Sport mode: The quadcopter has no auxiliary flight function, and the pilot needs to control the flying height by himself through the throttle joystick. The flying speed is fast but it is more difficult to operate. S MODE is displayed in the OSD.

The flight mode is selected by a switch on the remote control transmitter. For more details, please refer to the chapter "Remote control operation-introduction to switch functions”

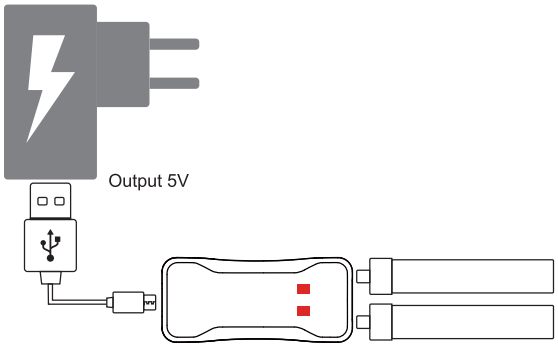
Caution: Please keep the flight altitude within 0.3-3m when it is the Adaption mode / Altitude mode. Otherwise, it might cause an unstable flying experience.

2.8 Battery Charging

Each battery provides 3-4 minutes of smooth flight. When LOW VOL is displayed on the OSD flight interface and the status LED on the quadcopter changes to flashing red, which means the battery is too low and needs to be charged. Charging steps are as follows:

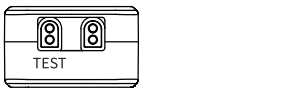
- Connect one or two batteries to the charger.
- Insert the charger into a USB port that has power available.
- The charger's LED turns solid red when charging.
- When the charger’s LED is solid green, battery is charging. Disconnect the flight battery from the charger.
- Charging a fully discharged (not over-discharged) battery takes approximately 20 minutes.

Caution: Only use the corresponding charger to charge the Li-Po batteries.

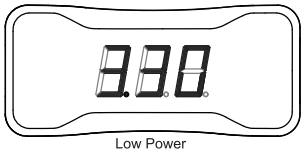


Charging

When the battery is inserted into the test port and the charger is not plugged in via USB, the current battery level will be displayed. Use "TEST" port to check battery status. 4.30 indicates a fully charged battery while 3.30 indicates the battery is low.



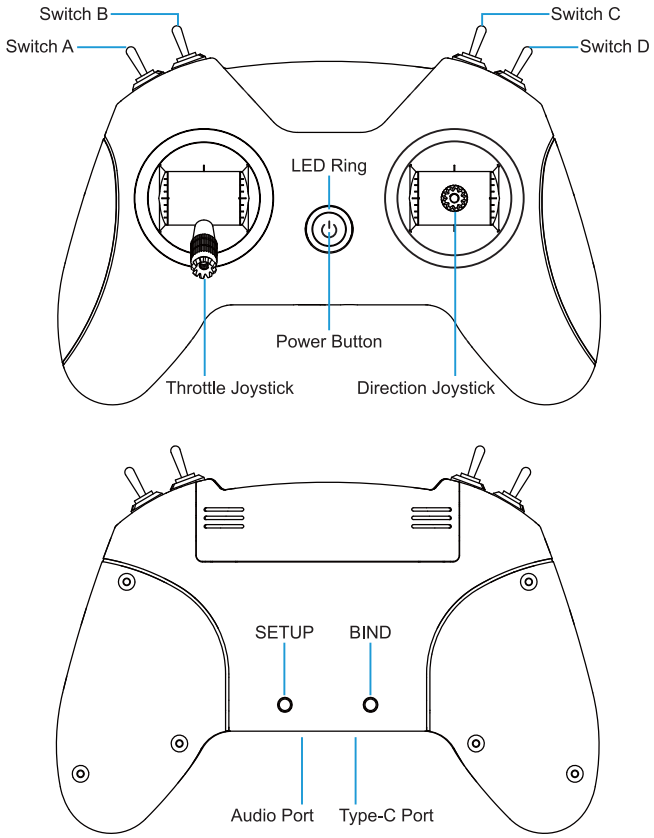
Full Power



Low Power

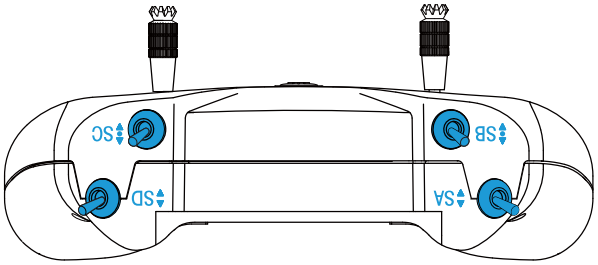
3.Remote Control Radio Transmitter

The remote control radio transmitter included in this kit is the LiteRadio 2 SE model.



3.1 Switch Functions

Four switches are provided on the front of the remote control radio transmitter: switch SA, switch SB, switch SC, and switch SD. Pilot can change different modes and parameters of the quadcopter with these switches. Please caution that switches do not function unless the remote control radio transmitter is connected successfully with the quadcopter.



Switch SA: Arm/Disarm Quadcopter

- Quadcopter will be disarmed if SA is down.
- Quadcopter will attempt to arm when the user moves switch SA up. (Arming may fail if throttle is not at the lowest position)

Switch SB: Flight Mode of Quadcopter

- The flight mode is "Adaption mode" if switch SB is down (A MODE).
- The flight mode is "Normal mode" if switch SB is in the middle (N MODE).
- The flight mode is "Sport mode" if switch SB is up (S MODE).

Switch SC: VTX Channels of Quadcopter

Change Video Transmitter (VTX) frequency. 8 frequency points are available. When moving beyond the last frequency point (5866), the first frequency point (5733) will be selected.

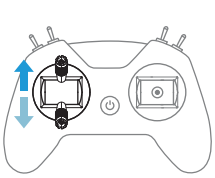
Available channels follow these frequencies:
5733/5752/5771/5790/5809/5828/5847/5866 which correspond to band B

Switch SD: Reserved, not used.

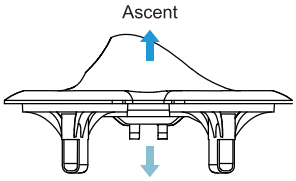
3.2 Joystick Functions

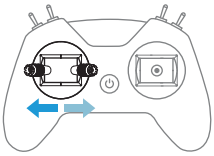
Two joysticks (throttle & direction joysticks) on the front of the remote control radio transmitter control the quadcopter: Ascent/descent (throttle), forward/backward tilt (pitch), left/right tilt (roll), and rotation of flight direction(yaw)

Throttle (left) Joystick - Ascent/descent (throttle) and rotation (yaw).

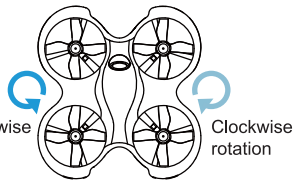


Joystick up/down

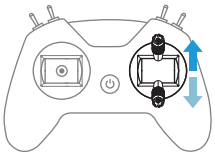




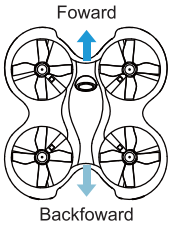
Joystick left/right

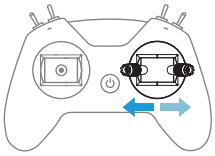


Direction (right) Joystick - forward/backward tilt (pitch) and left/right tilt (roll).

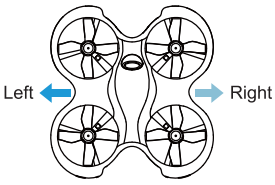


Joystick up/down





Joystick left/right



3.3 Button Functions

There are three buttons on the remote control radio transmitter.

● Power button: Turns the remote control radio transmitter on/off.

● BIND button: Enter binding mode (active after the remote control radio transmitter is powered on).

● SETUP button: Enter joystick calibration mode after remote control radio transmitter is powered on.

See"Advanced Settings" for more information on binding or joystick calibration.

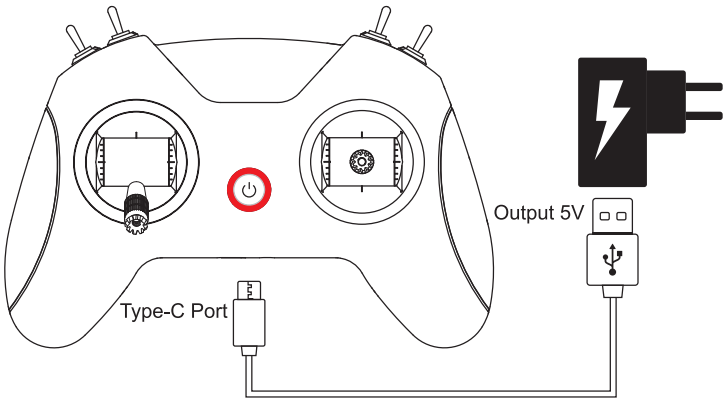
3.4 Charging the Remote Control Radio Transmitter

The remote control radio transmitter has a built-in 1000mAh battery. It indicates a low battery and needs to be re-charged if the blue light flashes slowly. To charge the remote control radio transmitter battery:

● Turn off the remote control radio transmitter.

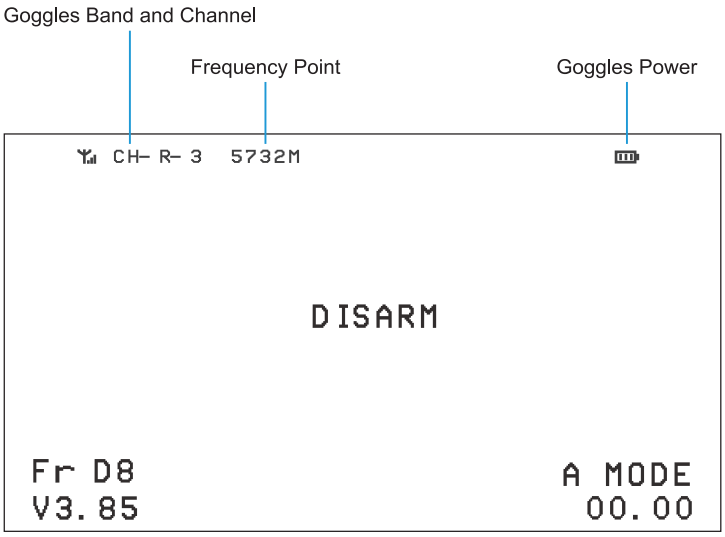
● Plug the Type C cable into the remote control radio transmitter(5V output adapter is allowed).

● A red LED indicates charging, while off means fully charged.

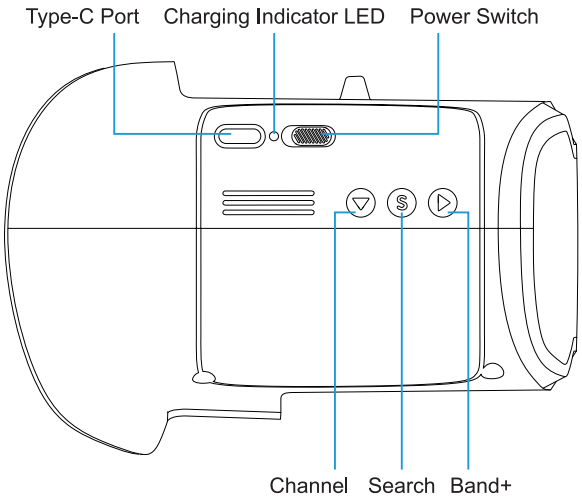

Output 5V
Type-C Port

4.FPV Goggles

The FPV goggles used in the kit, named model VR02. The FPV goggles use the built-in antenna to receive video. The status of the FPV goggles will be displayed over the FPV image in the OSD, as shown in the figure below.



4.1 Button Operation



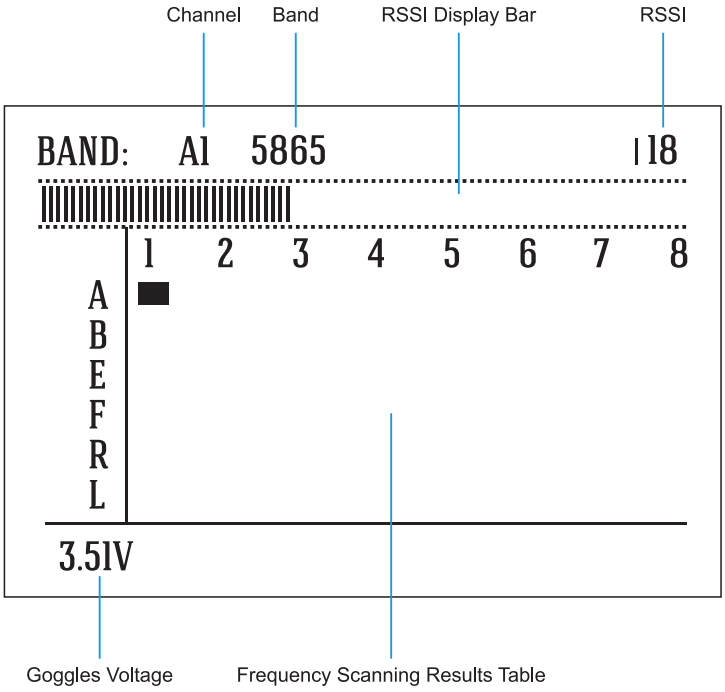
● Power switch

Turn the power switch left and right to turn the goggles on or off. When facing the switch, left position is off; The opposite of the position is on.

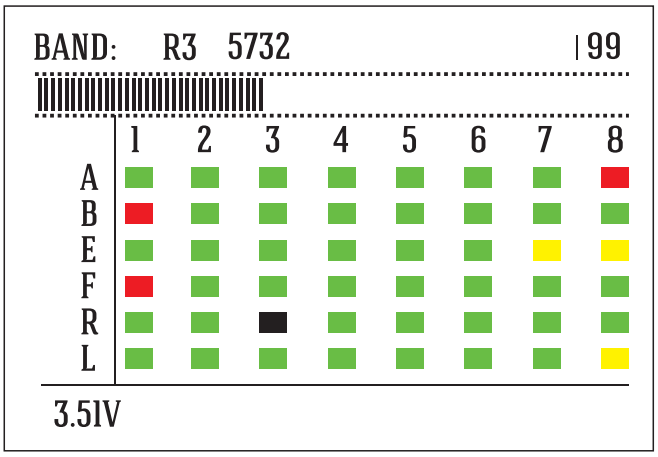
● Search button (S)

Quick frequency search: Press and hold the frequency search button for 1 second to start frequency search. After 3 seconds, a beep will sound and the best available frequency will be selected. Quick frequency search is completed.

Frequency scan: Short press the frequency search key once to enter the frequency sweep interface.



Press and hold for 1 second to start the sweep, and the sweep result will be displayed after 3 seconds. The different colors in the screen indicate the current status of each frequency point as follows:



Green	0<RSSI<20 Frequency is available
Yellow	20<RSSI<70 Frequency has moderate interference from another transmitter
Red	70<RSSI<99 Frequency is completely in use by a transmitter
White	The strongest signal which the goggles received in this scan

● Channel key and band key

In the frequency scan interface, the band key can be selected from different frequency bands, and the channel key can be cycled to the right to select different frequency channels. Pilot can adjust the goggles frequency by pressing the band key and channel key.

For example, select a band and channel with green status since these frequencies are not used by anyone and signal interference is relatively small. Then, set the quadcopter to the corresponding frequency and adjust the goggles to match.

4.2 Band and Channel Selection

The FPV goggles can receive 40 frequency points in the 5.8GHz spectrum, distributed across 5 bands (A, B, E, F, and R) of 8 channels each.

The quadcopter included in this kit only uses 8 frequency points of band B, which is the second row in the table below.

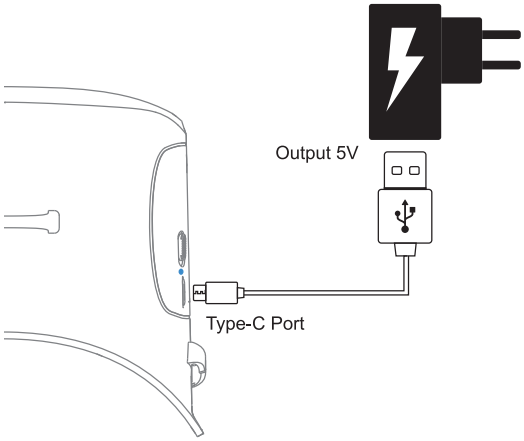
	CH 1 (MHZ)	CH 2 (MHZ)	CH 3 (MHZ)	CH 4 (MHZ)	CH 5 (MHZ)	CH 6 (MHZ)	CH 7 (MHZ)	CH 8 (MHZ)
A	5865	5845	5825	5805	5785	5765	5745	5725
B	5733	5752	5771	5790	5809	5828	5847	5866
E	5705	5685	5665	5645	5885	5905	5925	5945
F	5740	5760	5780	5800	5820	5840	5860	5880
R	5658	5695	5732	5769	5806	5843	5880	5917

Generally, we use the search frequency and frequency modulation button to press and hold for 1 second to automatically search for the frequency point with the strongest signal strength in the space to obtain the FPV picture of the quadcopter.
We can also short press the frequency search button to switch to the designated frequency band and use the frequency group key/frequency point key to switch to the designated channel so that the FPV goggles can work on the designated frequency point.

4.3 Charging the FPV Goggles

The FPV goggles have a built-in 2000mAh battery. When voltage is below 3.55V, a beep will sound in every 10S and it needs to be recharged. To charge the goggles battery:

- Turn off the FPV goggles.
- Plug the FPV goggles with a Type-C cable (5V output adapter is allowed).
- The power light will be blue when charging and lights out when fully charged.


Output 5V
Type-C Port

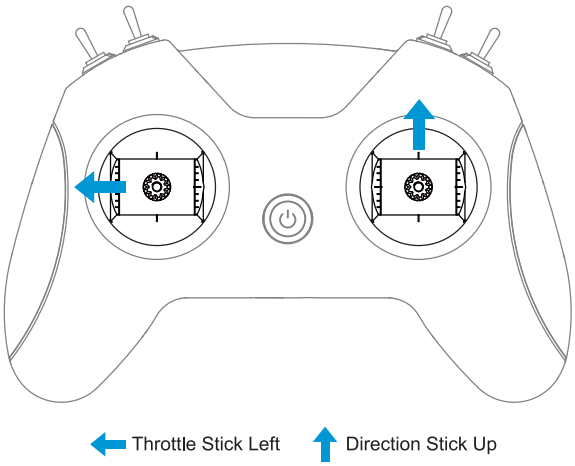
5.Quadcopter OSD Menu Operation

The quadcopter has a separate OSD menu which is used to configure the quadcopter.
- Turning on/off Quadcopter RGB LED Lights.
- Add/Remove Information from the flight OSD.

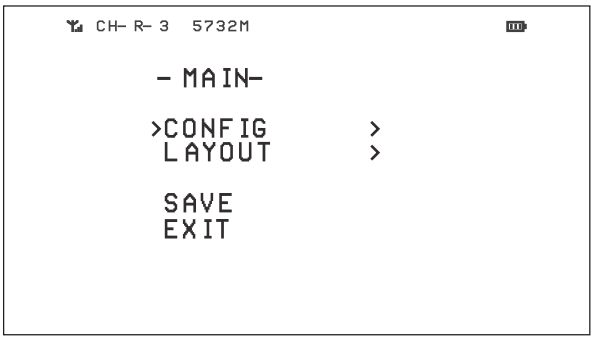
5.1 How to Access/Operate OSD Setting Menu

To access the quadcopter's OSD Menu, disarm the quadcopter. Place the joysticks in the positions shown below. The throttle joystick is moved to the left-center and the direction joystick towards the upward center.

Caution: Make sure the quadcopter is disarmed before entering the OSD menu.

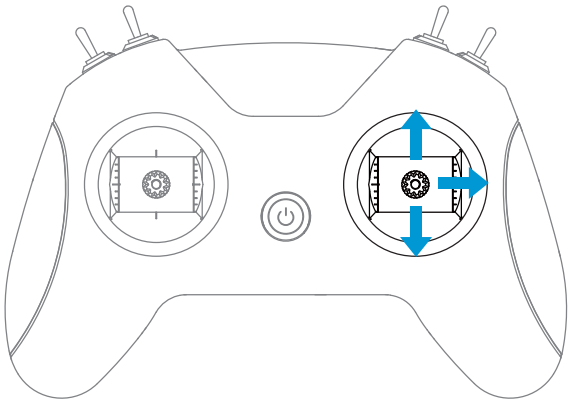


After accessing the OSD menu, pilot will see the following menu interface on the FPV screen.



Control the OSD using the right joystick to adjust the cursor and confirm or modify settings.

- Up: the cursor will move up
- Down: the cursor will move down
- Right: confirm/modify selection



Joystick up: Cursor Move up

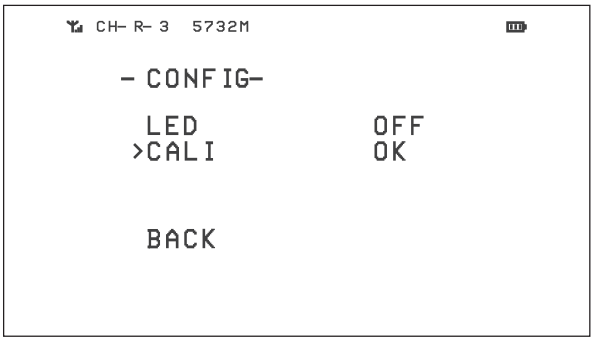
Joystick down: Cursor Move down

Joystick right: Modification/Confirmation

5.2 Turn Quadcopter RGB LED on/off

The quadcopter Status LED light is normally solid blue when flying. This can be changed to color cycling:

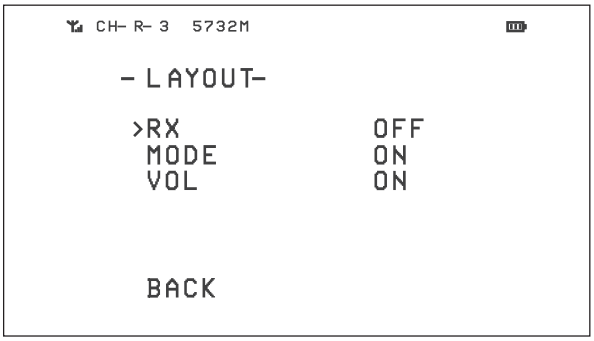
- In the -MAIN- menu, select CONFIG and enter the -CONFIG- menu.
- Select LED, select OFF (for solid blue) or ON (for RGB color cycling effect).
- Select BACK to exit CONFIG sub-menu.
- Select SAVE in the MAIN menu to save changes and exit the OSD.



5.3 OSD Flight Information

Pilot can customize the information displayed on the in-flight OSD including: receiver mode, flight mode, and battery voltage.

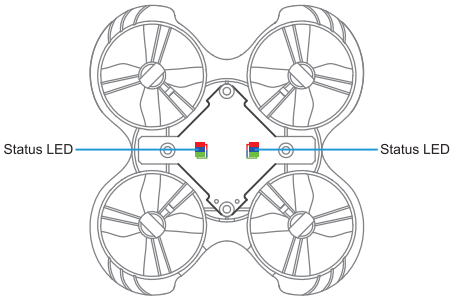
- In the -MAIN- menu, select LAYOUT and enter the -LAYOUT- menu.
- Select the desired item to change. OFF will make the item invisible and ON will show the item on the OSD.
- Select SAVE in the MAIN menu to save changes and exit the OSD.


CH- R- 3 5732M
- LAYOUT-
>RX OFF
MODE ON
VOL ON
BACK

6.LED Light/Beep Status Codes

6.1 Quadcopter LED Light

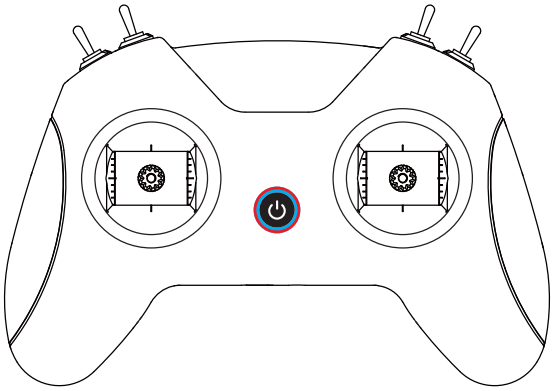
There are two RGB Status LEDs on the bottom of the quadcopter.



Status LED color	Status	State description	Solution
——	Off	The power on the quadcopter is abnormal or off	Replace the battery and power on again
Red	Flashes twice, intermittently	Quadcopter battery is low	Replace the battery
Blue	Solid	The quadcopter is connected with the radio controller (ready to fly)	
Green	Flashes three times, intermittently	The quadcopter enters the linking state (bind mode)	
White	Flashing fast	Arming failed because the throttle joystick of the remote control was not at the lowest position when arming	Disarm, and place the throttle joystick at the lowest position
Brown	Flashing slowly	Loss of remote control signal	Re-establish the connection with the remote control

6.2 Remote Control Radio Transmitter LED Light & Beep Status Codes

There is a blue & red LED indicator light around the power button which indicates the status of remote control radio transmitter.



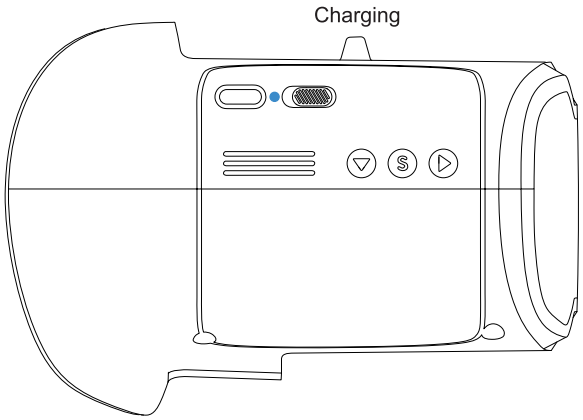
Indicator LED Color	Status	State description	Solution
Red	Solid	Throttle joystick is not at the lowest position when starting up	Move throttle joystick to the lowest position
Red	Flashing fast	Remote control radio transmitter is in binding mode	Wait for binding
Blue	Flashing slowly	Battery voltage is too low	Charge remote control radio transmitter

There is a built-in Beeper that can be used to determine its working status.

Beep	State description
Three consecutive beeps: beep-beep-beep	Low battery

6.3 FPV Goggles LED Light Status Codes

The FPV Goggles have a LED indicator lights which indicate battery power.



Indicator LED Color	Status	State description
Blue	Solid	Charging
——	Off	Not charging or charging is complete

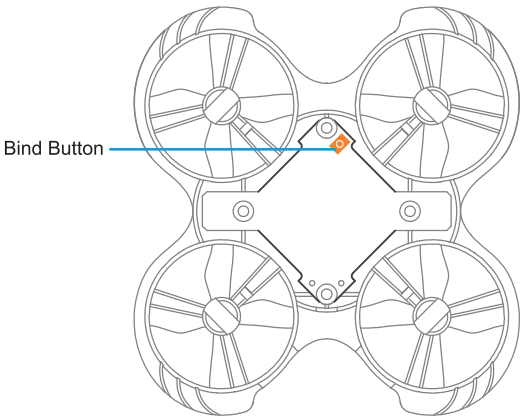
7.Advanced Settings

This kit has settings prepared by default. Additional advanced settings are available in case the pilot wants to change parts or connect with other equipment.

7.1 Re-bind for Quadcopter

If quadcopter and remote control radio transmitter cannot be connected successfully, the pilot may need to re-bind. This can happen when replacing new electronic parts of the quadcopter during maintenance or upgrading the remote control radio transmitter. The steps are as follows:

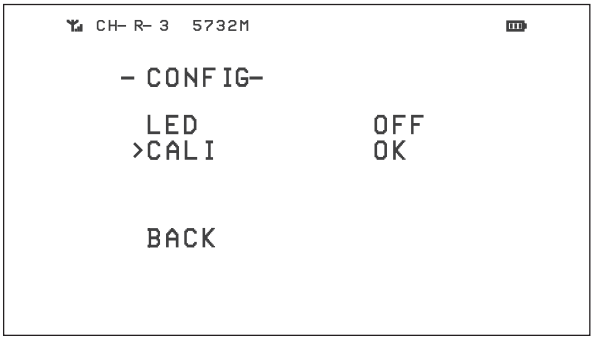
- Power on the quadcopter and wait for its system to load completely.
- Press the BIND button on quadcopter with a screwdriver. The status light will turn green and flash 3 times in a cycle.
- Power on the remote control radio transmitter and wait for its system to load completely.
- Press the BIND button on the back of the remote control radio transmitter with a screwdriver. The power indicator will flash red.
- If re-bind is successful, quadcopter status light will change to blue.



7.2 Quadcopter Level Calibration

After the quadcopter has taken off and landed several times, the quadcopter gyroscope may become offset. This will cause the quadcopter to always tilt in the same direction during a flight. To fix up it, the quadcopter gyroscope can be recalibrated. The steps are as follows:

- Turn on the quadcopter and the remote control radio transmitter, and ensure that the connection is successful.
- Place the quadcopter on a horizontal plane.
- Enter the quadcopter's OSD menu (see "OSD Menu Operation").
- In the MAIN menu, select CONFIG, then CALI.
- Push the directional joystick to the right to enter calibration mode.
- When the OK prompt appears, the calibration is complete. Pilot can exit the OSD menu.



7.3 Remote Control Radio Transmitter Calibration

After repeated use or if the remote control radio transmitter is subjected to physical impact, the joysticks may no longer read correctly and require recalibration.

● After powering on, press the SETUP button on the back of the remote control radio transmitter which will beep twice, and LED will quickly flash red twice. The remote control radio transmitter has entered calibration mode.
● Move throttle joystick and direction joystick to middle position. Press SETUP button again and wait until the remote control radio transmitter beeps three times. The red LED will flash twice quickly. This indicates joysticks center data has been acquired.
● Slowly rotate the throttle and direction joystick twice around the boundary of the joysticks(once counterclockwise and once clockwise), then press SETUP button again. The remote control radio transmitter will emit a beep for about 3 seconds and LED will stop flashing. Calibration has been completed successfully.

8.Supplement

8.1 Warning & Security

● Move the throttle joystick as gently as possible to avoid ascending and descending too suddenly with the quadcopter.
● Push switch SA down on the remote control radio transmitter immediately if the quadcopter collides with any object.
● Please try to keep motors perpendicular to the body, otherwise, flight performance will be degraded.
● Learn to control the quadcopter proficiently before flying in a large outdoor area or with the wind.
● Battery life can be significantly reduced if pilot continues to fly after the low voltage warning is shown.
● Do not fly in rain. Humidity may cause unstable flight or loss of control.
● Keep the battery away from water. If the flight controller touches water, a short circuit may occur and the flight controller may burn out.
● Do not fly in inclement weather or thunderstorms.
● Do not fly in areas that are not permitted by local law.

8.2 Precautions for Battery Use and Charging

● Do not immerse the battery in water. Store in a dry area if not used for a long time.
● Keep away from children. If swallowed, seek medical attention immediately.
● Do not use or store the battery near heat sources, microwave ovens, or open flame.
● Only use a battery charger that meets the specifications when charging.
● Do not throw the battery into fire or heat the battery.
● Do not use or store the battery in an extremely hot environment, such as in a car under direct sunlight or hot weather. Overheating affects the performance of battery and shortens the service life of the battery. Overheated batteries can catch fire.
● If the battery has a peculiar smell, temperature, deformation, discoloration, or any other abnormal phenomenon, stop using the battery. Recycle and replace the battery.
● If the battery connector gets dirty, please wipe it with a dry cloth before use. Avoid getting battery contacts dirty, which can cause energy loss or failure to charge.
● Disposing of the battery randomly may cause a fire. Please fully discharge the battery and use insulating tape to dispose of the battery output connector before disposing of the battery. Refer to local regulations before disposing or recycling a battery.

8.3 After-sale Service

● Warranty: All defective merchandise, unless otherwise indicated, may be returned for a replacement within 30 days from the goods received date. We cannot provide refunds or replacements beyond 30 days.
● If the product is confirmed to have a quality problem (product design or quality issues), we will cover it with replacing or refund.
● All warranty replacements are required to have photos or videos and a detailed description. Warranty does not cover physically damaged merchandise. We are willing to figure out the best solutions, as always.
● For after-sale service, please reach out via e-mail: Support@betafpv.com

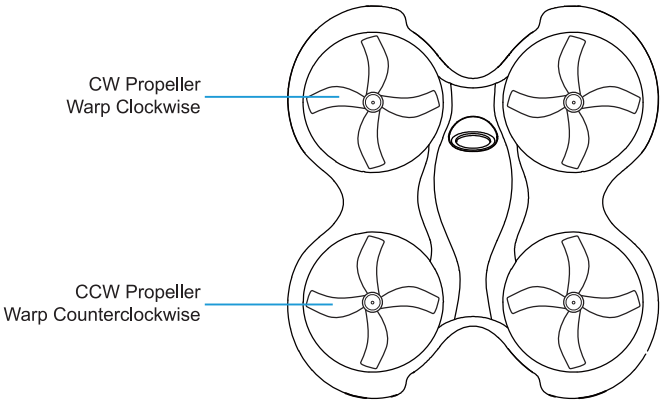
This clause only applies to the products manufactured by BETAFPV and sold by BETAFPV authorized dealers.
The specific interpretation rights of this clause belong to BETAFPV.

9.FAQ

9.1 How to Replace Propellers

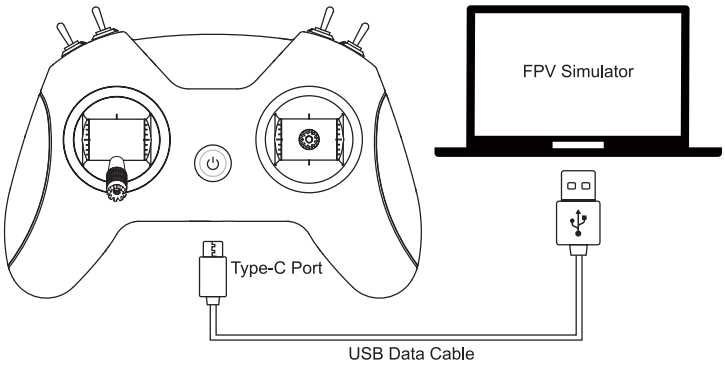
Propellers can be deformed or fall off when quadcopter collides with an object. Bent or missing propellers need to be replaced.
Use the included propeller removal tool to remove propellers from the motor. Please hold the motor instead of the frame duct with your hand when removing propellers to protect the frame from being deformed by overexertion.

4 spare propellers are included: two each clockwise (CW) and counterclockwise (CCW). CW propeller rotates clockwise. It is used on the front left or rear right motor. CCW propeller rotates counterclockwise. It is used on the front right or rear left motor. Install as in the diagram below.



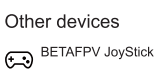
9.2 How to Use FPV Simulator

The safest and quickest method to get started is to use an FPV simulator. The LiteRadio 2 SE remote control radio transmitter supports most FPV simulators on the market with a comprehensive configuration.



To connect your radio:

- Turn on the remote control radio transmitter and wait the blue light to show.
- Connect the remote control radio transmitter to PC by USB cable.
- The correct driver will install automatically. A box pops up to confirm successful installation.

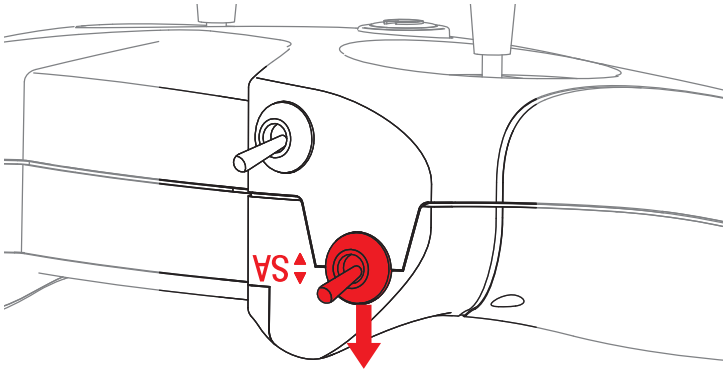


If the automatic install fails, pilot will need to install the driver manually.

9.3 How to Stop After a Collision

Push down on switch SA on the remote control radio transmitter immediately once the quadcopter collides with an object. All motors will immediately stop.

Caution: Push down switch SA immediately when the quadcopter is hit or the propellers scratch against the frame duct.



Push Down to Disarm the Quadcopter

FCC Caution:

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

This device 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:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

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