SVTECH

SV-V15

VTOL Fixed-wing UAV

English technical reference prepared from the Chinese product document. Legacy contact details have been removed. Numeric values marked [verify] require confirmation before ordering or operation.

SV-V15 VTOL Fixed-Wing UAV Product Manual

0 Control Sticks (Yaw, Throttle, Roll, Pitch)

Default setting: Manual throttle (throttle auto-centers), Mode 2 (American hand).

0 Carrying Hook

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Used for fixing the mobile device holder and connecting the transmitter neck strap.

Power Switch

Turn the transmitter ON/OFF. Press and hold both switches simultaneously for 2 seconds to turn the transmitter ON/OFF.

0 Flight Mode Switch

2-position, self-locking (with slight return), long lever. The corresponding modes for up/down are: GPS Positioning Mode (default), Cruise Mode.

0 Return-to-Home (RTH) Mode Switch

2-position, self-locking (no return), long lever. The corresponding modes for up/down are: RTH Mode OFF (default), RTH Mode ON.

0 Handle

For convenient carrying.

0 Battery Rear Cover

Prevents the battery from sliding out.

2.4 Unlocking and Locking

There is only one unlocking method. Regardless of Mode 1 (Japanese hand) or Mode 2 (American hand), perform the action shown in Figure 2-12 to unlock, and the action shown in Figure 2-13 to lock. After the aircraft lands, keep the throttle stick at the lowest position for at least 3 seconds; the aircraft will perform automatic locking. After the flight controller calibrates the ESCs, upon unlocking, the motors will start sequentially. Once Motor 1 starts rotating, pushing the throttle will cause all other motors to start simultaneously.

Figure 2-12 Unlock

Figure 2-13 Lock

2.5 Compass Calibration

Compass calibration procedure steps:

Step 1. Push the throttle stick to the lowest position.

Step 2. Quickly toggle the Flight Mode switch between the lowest and highest positions approximately 60 times until the status indicator LED shows a solid blue light.

Step 3. Place the aircraft nose forward, level horizontally, then slowly rotate it clockwise at least one full turn until the status indicator LED shows a solid green light.

Step 4. Point the aircraft nose downward, fuselage vertical, then slowly rotate it clockwise at least one full turn until the status indicator LED shows a solid white light for 4 seconds.

If the status indicator LED shows a solid red light for 4 seconds, calibration has failed. Repeat steps 2 through 4 until the operation is successful.

The operation diagram is shown in Figure 2-15.

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Product Manual

Product Model: SV-V15 VTOL Fixed-wing UAV

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This document provides product description and operation guidance.

1. SV-V15

2.1 Aircraft Specifications

(If you have any doubts about the safety of this product, please notify our company for a technical inspection.)

| Item | Content |

| :--- | :--- |

| Material | Carbon fiber and fiberglass |

| Wingspan | 50mm [verify] |

| Payload | ≥10kg |

| Max Payload | 15kg |

| Max Takeoff Weight | 55kg |

| Fuel | #92 Gasoline |

| Service Ceiling | 4500m |

| Max Endurance | 16 hours (heavy fuel engine) |

| Cruise Speed | 60 km/h |

| Climb Speed | 5 m/s |

| Control Radius | 30 km |

| Wind Resistance | Level 6 |

| Item | Content |

| :--- | :--- |

| Optical Zoom | 30× |

| Working Band | 0.4μm – 0.9μm |

| Focal Length | 4.3mm – 129mm |

2.2 Gimbal System

| Item | Content |

| :--- | :--- |

| Video Output | HD-SDI, 1080P 30Hz |

| Infrared Type | Long-wave uncooled |

| Infrared Working Band | 8μm – 14μm |

| Infrared Detector Pixels | 64512 [verify] |

| NETD | 50mK |

| Dimensions | 120mm × 183mm [verify] |

| Weight | 860g |

| Operating Temperature | -20°C to 60°C |

2.3 Transmitter (SV-V15 Remote Controller)

Transmitter Stick Definitions

Battery Performance

Stick, Switch, and Knob Functions and Types

Throttle stick pushed down is low position.

Indicates current GPS status and [text unclear].

2.6 Level Calibration

Quickly toggle [switch] approximately 5-10 times.

Level, rotate clockwise at least one turn.

New calibration.

Nose down, rotate vertically clockwise at least one turn.

Calibration failed.

Calibration successful.

Figure 2-15 Compass Calibration

Level calibration procedure steps:

Step 1. Place the aircraft on a level surface, ensuring the fuselage is horizontal and free from vibration.

Step 2. Perform the outward "V" (figure-eight) locking action on the transmitter and hold for more than 10 seconds until the status indicator LED begins alternating flashing blue and green.

Step 3. Release the transmitter control sticks. After approximately 10 seconds, the status indicator LED will change to a single blue flash. After approximately 15 seconds, the status indicator LED will flash normally.

The operation diagram is shown in Figure 2-16.

Aircraft placed level.

Indicates current GPS status and [text unclear].

Perform outward "V" locking action, hold for more than 10 seconds.

Figure 2-15 Level Calibration

If during subsequent flights, after taking off in Attitude Mode, the aircraft still leans significantly to one side, it is recommended to redo the level calibration.

2.7 Flight Modes and Corresponding Responses

The SV-V15 has multiple operating modes. The aircraft's behavior differs depending on the mode used. The response of the aircraft to stick inputs in different modes is shown in Table 3-1.

Table 3-1 SV-V15 Flight Control Mode Description

| Control Mode | Roll/Pitch | Yaw | Throttle |

| :--- | :--- | :--- | :--- |

| GPS Mode | Roll/Pitch tilt angle proportional to stick input magnitude. Yaw speed corresponds to stick input magnitude. | Motor average output corresponds to current throttle value, and throttle input has maximum priority. | Roll/Pitch tilt angle proportional to stick input magnitude, but flight speed in the corresponding direction is limited to a maximum horizontal speed of [verify] m/s. Yaw speed corresponds to stick input magnitude. Throttle neutral position corresponds to altitude hold; throttle up/down amplitude corresponds to ascent/descent speed. |

2.8 LED Indicator Descriptions

In the table: R=Red, G=Green, B=Blue, Y=Yellow, P=Purple, C=Cyan, W=White.

The three primary colors of light are RGB; other colors are synthesized from these. At the same brightness, R+G=Y, R+B=P, G+B=C, R+G+B=W.

Numbers in the color definition boxes represent the duration of that color state.

The "Count" column indicates how many times the state repeats; it indicates continuous flashing.

| Cycle | Definition | Color | Frequency | Duration | Meaning |

| :--- | :--- | :--- | :--- | :--- | :--- |

| Flight | R2Y1 | | Alternating | | Attitude Mode, GPS satellites < 7 |

| | G1Y1 | | Alternating | | Attitude Mode, GPS satellites ≥ 7 (poor accuracy) |

| | R1P1 | | Alternating | | Attitude Mode, GPS satellites ≥ 7 (good accuracy) |

| | [verify]P1 | | Alternating | | GPS Mode, GPS satellites ≤ 7 (poor accuracy) |

| | R[verify]1 | | Alternating | | GPS Mode, GPS satellites > 7 (good accuracy) |

| | Y1B1 | | Alternating | | System initialization complete |

| | Y1G1 | | Alternating | | Transmitter signal lost |

| | R1 | Solid | | 4S | Compass data abnormal |

| | B0 | Solid | | | First level low voltage alarm |

| | G0 | Solid | | | Second level low voltage alarm |

| | | Solid | | | Start compass horizontal calibration |

| | | Solid | | | Start compass vertical calibration |

| | | Solid | | 4S | Compass calibration successful |

| | | Solid | | 4S | Compass calibration failed |

2.9 First Test Flight

For the first test flight, it is recommended to follow these steps for pre-flight inspection and flight.

Pre-flight Inspection

Check the following items to avoid flight incidents:

1. Aircraft nose direction

2. GPS/Compass module orientation

3. Main controller installation direction

4. Whether each rotor rotation direction is correct

5. Whether the motor rotation direction is correct

Power-on Self-test

To ensure flight safety.

Power-on check steps (refer to "LED Indicator Descriptions" for LED status meanings):

Step 1. Turn on the transmitter first, then connect the main flight controller power.

Step 2. After the main controller powers on, avoid shaking the aircraft until the [verify] combination flashing is complete. Otherwise, poor flight attitude may result.

Step 3. Observe the LED status indicator. Wait until the GPS/Compass module has acquired sufficient satellites for positioning before proceeding to the next step.

Step 4. Toggle the Flight Mode switch back and forth, observing if the LED flight mode indication matches the switch position.

Step 5. Place the aircraft at least 20 meters away from the operator and wait for the flight control system to acquire satellites normally (red flashing light changes to green flashing light).

Step 6. Turn on the backup power switch on the aircraft, ensuring the backup power is connected to the aircraft.

Step 7. In Attitude Mode, simultaneously move both transmitter control sticks to the lower right corner. The motors will unlock and start sequentially from Motor 1. If the throttle stick value exceeds 2% [verify] during the sequential start, all motors will start immediately.

Step 8. After all motors have started, gently push the throttle stick to 3% [verify] and hold. Slightly apply roll and pitch stick inputs, observing if the motor speed increase corresponds to the stick input. If consistent, return the roll and pitch sticks to center, continue pushing the throttle until the aircraft lifts off.

Step 9. Test the feel of each control channel at an altitude below 2 meters. Check if the response is normal.

After flight, check if the temperatures of the clockwise and counter-clockwise rotating motors are consistent. If the temperatures are inconsistent, it indicates a possible load imbalance on the aircraft. The propeller plane needs to be calibrated to ensure all propellers are in the same plane.

2.10 Failsafe (Signal Loss Protection)

After the transmitter signal is lost, the LED indicator will first show [verify] (solid [color]). The aircraft will hover for 5 seconds, then return to the takeoff point, land, and lock. If the transmitter signal is restored during this process, the

aircraft will continue executing the automatic return-to-home. To interrupt the return-to-home action, toggle the transmitter Flight Mode switch at least once.

Disclaimer

Please read this manual carefully before using this product. By using this product, you acknowledge and accept all terms of this disclaimer.

This product is suitable for persons aged 18 and above. Under normal power supply and correct connection conditions, it can provide the user with excellent flight control. When debugging parameters or performing firmware upgrades on this aircraft system, we strongly recommend removing the propellers and ensuring normal power supply and correct wiring of relevant functional modules. Always keep away from crowds, dangerous objects, and fragile items during use. Shuangjie Technology assumes no liability for personal injury or property damage caused directly or indirectly by the following reasons:

1. User failure to assemble and use according to this manual.

2. User operating the aircraft under the influence of alcohol, drugs, fatigue, or other impaired physical or mental states.

3. User actively or intentionally operating the aircraft to cause harm.

4. User disassembling the product or modifying it with non-Shuangjie Technology parts, rendering the aircraft unable to function normally.

5. Injury caused by user operational error or subjective judgment error.

6. Injury caused by abnormal aircraft operation, such as natural wear, circuit aging, etc.

7. Injury caused by user operating the aircraft while knowing it is in an abnormal working state.

8. User operating the aircraft in severe weather conditions such as typhoons, hail, heavy fog, etc.

9. User flying in areas with magnetic field interference, radio interference, or government no-fly zones.

10. User piloting the aircraft in conditions of poor visibility or obstructed line of sight.

11. Infringement arising from any data, images, or materials obtained by the user using this product to operate the aircraft.

12. Other losses not within the responsibility scope of Shuangjie Technology.

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Business enquiries

Product selection · Project enquiries · Technical support

SV-V15

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