## HAWK'S WORK F450-KIT

# HAWK'S WORK F450 DIY Drone Kit Instruction Manual

Model: F450-KIT

## 1. Introduction

This manual provides detailed instructions for assembling, setting up, operating, and maintaining your HAWK'S WORK F450 DIY Drone Kit. This kit is designed for enthusiasts and beginners interested in learning the fundamentals of drone construction and flight. It offers a versatile platform for various applications, including research and secondary development.


*Image: All components of the HAWK'S WORK F450 DIY Drone Kit, including the frame, motors, ESCs, battery, propellers, and accessories.*

## 2. What's in the Box

The HAWK'S WORK F450 DIY Drone Kit includes the following components:

- F450 Frame
- Battery
- Propeller Set
- Protective Frame
- Screwdriver
- User Manual (this document)
- Electronic Speed Controllers (ESCs)
- Brushless Motors
- Other necessary accessories (e.g., zip ties, hook & loop fasteners)

Please verify all components are present upon opening the package. Refer to the 'Parts List of Each Kit' image for a visual guide to the included items.

# Parts List of Each Kit

| | KIT-A | KIT-B | KIT-C | KIT-D | KIT-E |
|---|---|---|---|---|---|
| Frame | F450 Pre-soldered  | | | | Standard  |
| Transmitter | FS-I6X  | - | | | |
| Pixhawk | Pixhawk 2.4.8 Kit  | | - | | |
| GPS | M8N  | | - | | |
| Battery | 11.1V 4200mAh  | | | - | |
| ESC | 20A ESC * 4  | | | | - |
| Motor | 2212 Brushless Motor * 4  | | | | |
| Prop | 9450 * 4  | | | | |
| Others | Shock Absorber  | Screwdriver  | Zip tie  | Hook & loop  | Foam tape  |

CAUTION: Please note the differences between the different sets.

*Image: A detailed table outlining the components included in various F450 drone kits, with Kit-C (the current model) showing the frame, 11.1V 4200mAh battery, 4x 20A ESCs, 4x 2212 brushless motors, 4x 9450 propellers, shock absorber, screwdriver, zip ties, and hook & loop fasteners.*

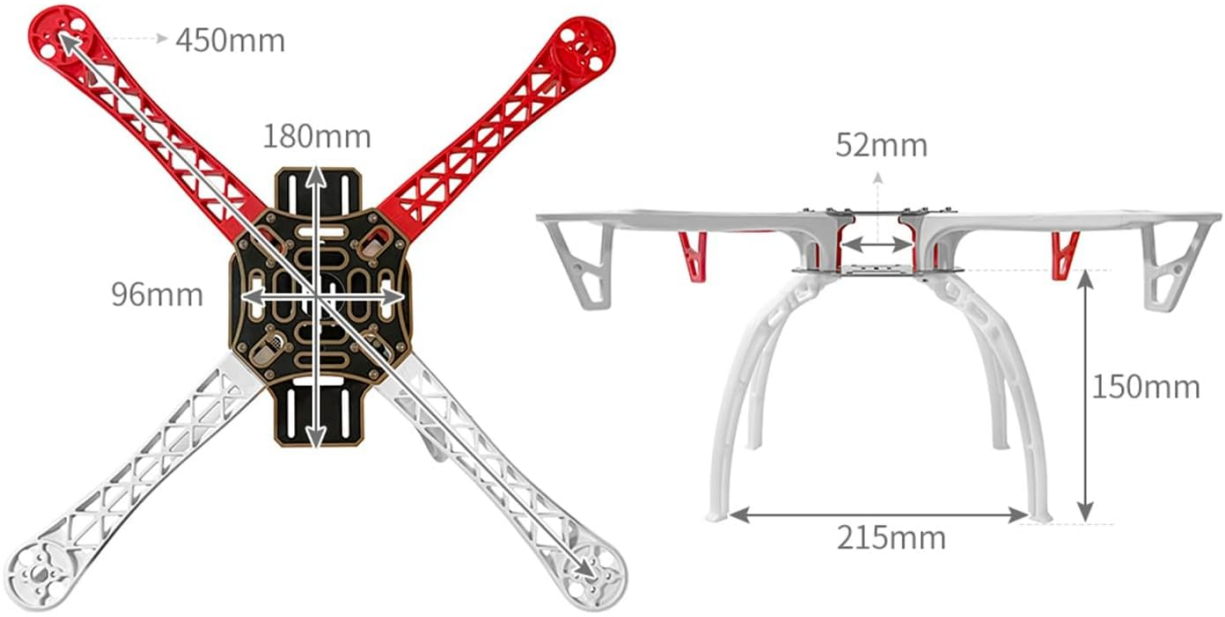
## 3. Assembly Instructions

Follow these steps to assemble your F450 drone kit. Ensure you have a clean workspace and the provided tools.

### 3.1 Frame Assembly

The F450 frame is designed for easy installation. The main board may come pre-soldered with an XT60 connector for quick battery connection.

# Easy-to-Install Frame




## Pre-soldered with XT60

**Just plug into it!**

*Image: A diagram illustrating the dimensions of the F450 frame (450mm wheelbase) and a close-up of the main distribution board, indicating it is pre-soldered with an XT60 connector for power input.*

1. **Attach Arms to Main Plate:** Secure the red and white arms to the central main plate using the provided screws. Ensure correct orientation for motor mounting.
2. **Install Landing Gear:** Attach the landing skids to the underside of the arms.
3. **Mount Motors:** Secure each brushless motor to the end of each arm using the small screws. Ensure they are firmly attached.
4. **Connect ESCs:** Connect the three wires from each motor to the corresponding three wires on an Electronic Speed Controller (ESC). These connections are typically interchangeable for brushless motors.
5. **Mount ESCs:** Secure the ESCs to the drone arms, often using zip ties or double-sided tape, ensuring they do not interfere with propeller rotation.


*Image: A visual guide demonstrating the key stages of building and preparing the F450 drone, from assembling the frame and connecting wires to setting up the transmitter, binding the receiver, calibrating flight control, and finally, flying the drone.*

### 3.2 Propeller Installation

Install the propellers onto the motors. Note that propellers are typically marked for clockwise (CW) and counter-clockwise (CCW) rotation. Ensure you install the correct propeller type on the corresponding motor as per the flight controller's motor layout diagram.

## 4. Wiring Diagram

Proper wiring is crucial for the safe and correct operation of your drone. Refer to the diagrams below for connecting the flight controller, ESCs, motors, power module, receiver, GPS, and other peripherals.

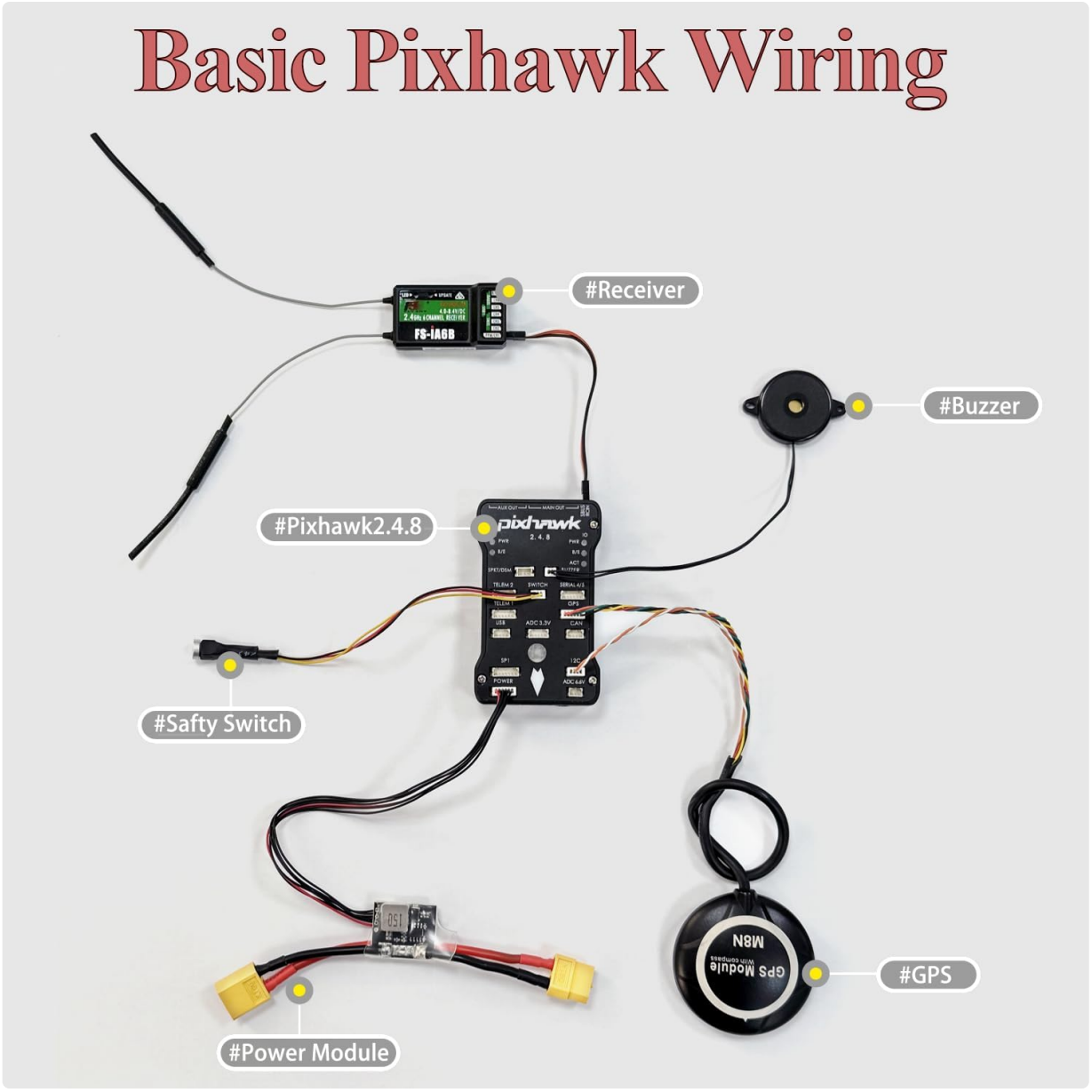
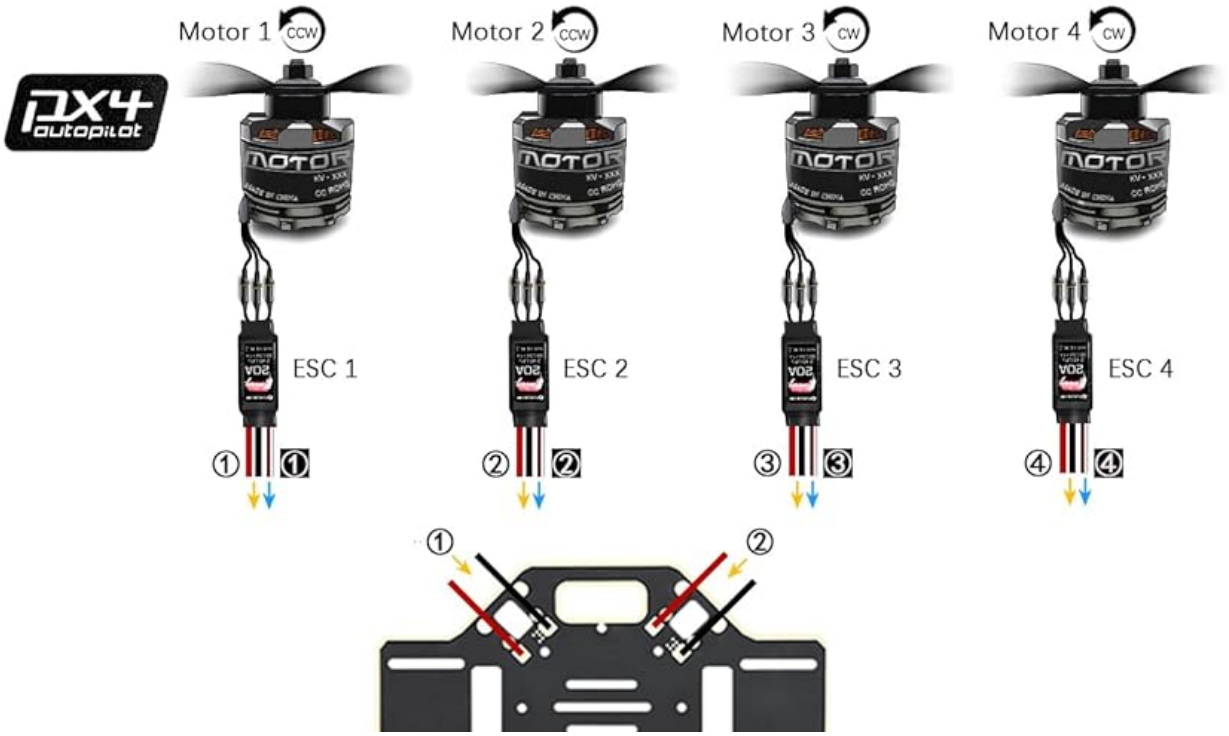



*Image: A simplified wiring diagram illustrating the connections to a Pixhawk flight controller, including the receiver, safety switch, power module, GPS module, and buzzer.*



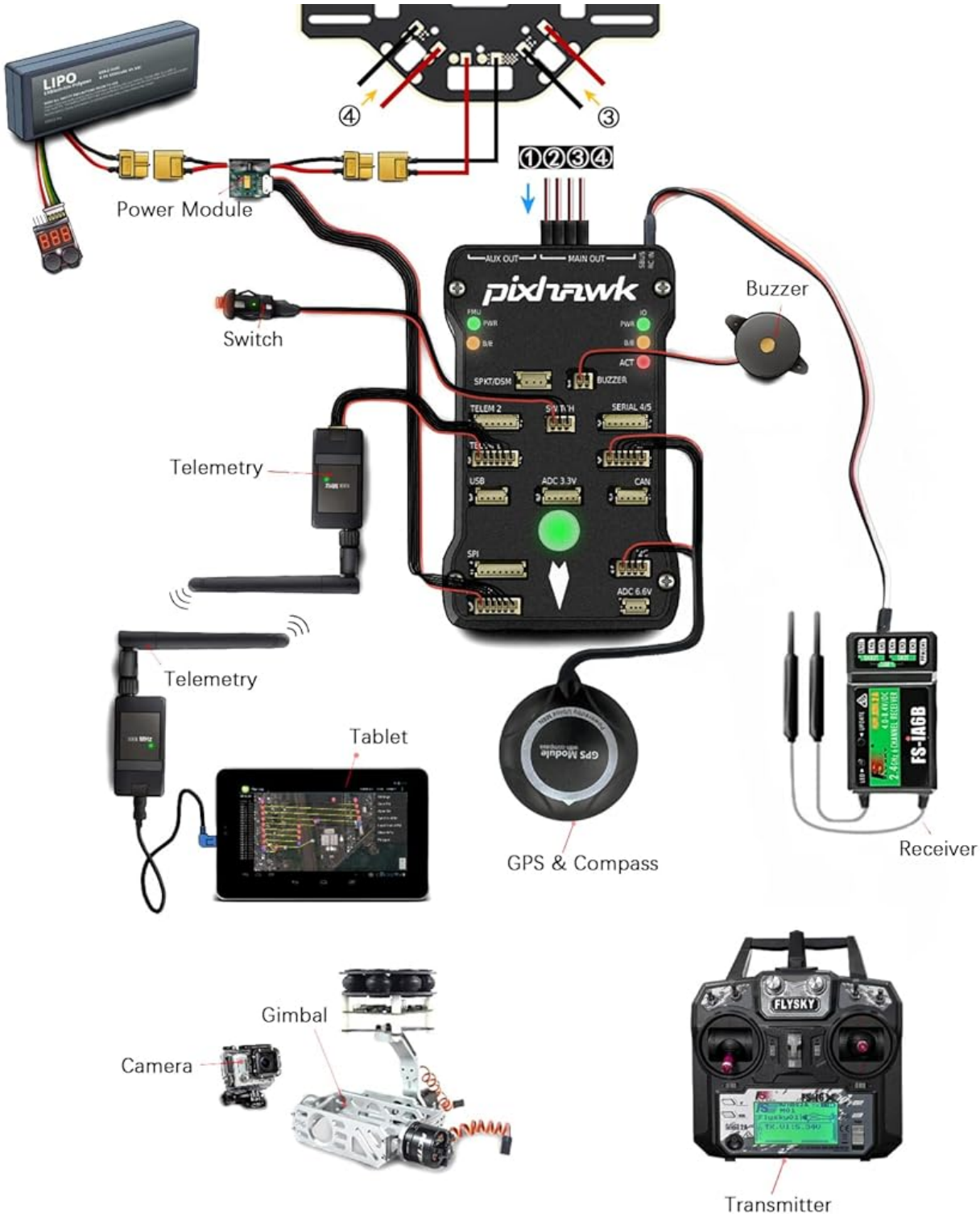



*Image: A comprehensive wiring diagram for a PX4-based quadcopter, detailing the connections from the motors to the ESCs, ESCs to the power distribution board, and the power distribution board to the flight controller. It also shows connections for the power module, telemetry, GPS, receiver, and an optional camera/gimbal setup with a transmitter.*

- **ESCs to Flight Controller:** Connect the signal wires from each ESC to the corresponding motor output pins on your flight controller (e.g., M1, M2, M3, M4).
- **Power Module:** Connect the power module to the flight controller's power input and to the main battery. This provides regulated power to the flight controller and monitors battery voltage/current.
- **Receiver:** Connect your radio receiver to the flight controller's RC input port.
- **GPS Module:** Connect the GPS module to the designated GPS port on the flight controller.
- **Buzzer & Safety Switch:** Connect these essential components to their respective ports on the flight controller.

## 5. Power System Components

The power system consists of the battery, ESCs, motors, and propellers. These components work together to provide thrust for flight.


*Image: A visual representation of the drone's power system components, including four Electronic Speed Controllers (ESCs), four brushless motors, a 3S 4200mAh Lithium Polymer battery, a voltage tester, a UBB charging cable, and 9450 self-tightening propellers.*

- **Battery:** The kit includes a 3S 4200mAh Lithium Polymer battery. Always ensure the battery is fully charged before flight and handle it with care.
- **ESCs (Electronic Speed Controllers):** Four 20A ESCs are provided to control the speed of each motor.
- **Brushless Motors:** Four 2212 brushless motors are included, offering efficient and powerful propulsion.
- **Propellers:** The kit contains 9450 self-tightening propellers. Ensure they are securely fastened and free from damage before each flight.
- **Voltage Tester:** Use the included voltage tester to monitor your battery's charge level.

## 6. Setup and Calibration

After physical assembly, the drone's flight controller and radio system require configuration and calibration.

### 6.1 Flight Controller Software

This kit is compatible with various flight control systems like Pixhawk, Ardupilot, and PX4. You will need to install appropriate firmware and use ground station software such as Mission Planner or QGroundControl on a computer or tablet.

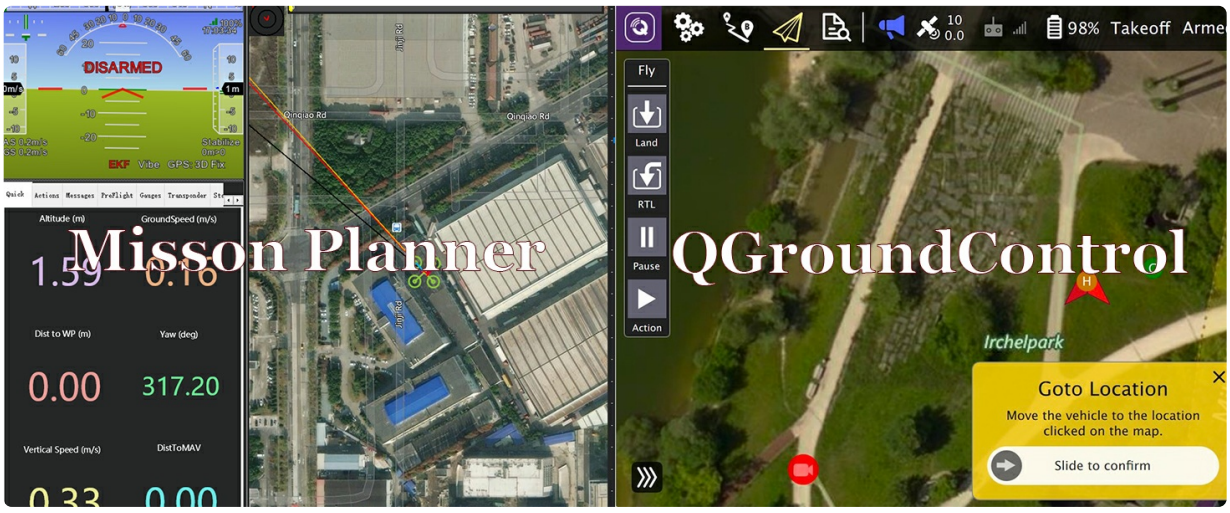



*Image: Screenshots displaying the user interfaces of Mission Planner and QGroundControl, two common ground station software applications used for configuring and monitoring DIY drones.*

### 6.2 Radio Transmitter and Receiver Setup

1. **Set up Transmitter:** Configure your radio transmitter (not included in this kit) according to its manual.
2. **Bind Receiver:** Bind the drone's receiver to your transmitter. Refer to your receiver's specific instructions for this process.
3. **Calibrate Radio:** Perform radio calibration within your chosen ground station software to ensure correct stick inputs are recognized by the flight controller.

### 6.3 Flight Controller Calibration

Within your ground station software, perform the following essential calibrations:

- **Accelerometer Calibration:** Calibrate the accelerometer to ensure the drone knows its level orientation.
- **Compass Calibration:** Calibrate the compass to ensure accurate heading information.
- **ESC Calibration:** Calibrate the ESCs to ensure all motors spin up and respond uniformly to throttle commands.
- **GPS Calibration:** If applicable, ensure the GPS module is acquiring satellites and reporting accurate position.

## 7. Operating Instructions

Before your first flight, ensure all pre-flight checks are completed.

*Image: The HAWK'S WORK F450 DIY Drone in stable flight outdoors, demonstrating its operational capability after assembly and setup.*

## 7.1 Pre-Flight Checklist

- Battery fully charged and securely mounted.
- Propellers correctly installed and tightened.
- All wires and connectors secure.
- Flight controller armed and GPS lock (if applicable).
- Clear flight area, free from obstacles and people.

## 7.2 Taking Off and Landing

1. **Arm Motors:** Follow your flight controller's specific arming procedure (e.g., stick combination or safety switch).
2. **Take Off:** Slowly increase throttle until the drone lifts off the ground. Maintain a stable hover.
3. **Flight:** Practice gentle movements with the control sticks. Always maintain visual line of sight.
4. **Landing:** Slowly decrease throttle to descend. Aim for a soft landing on a flat surface. Disarm motors after landing.

## 8. Maintenance

Regular maintenance ensures the longevity and safe operation of your F450 drone.

- **Inspect Propellers:** Check for cracks, chips, or bends before each flight. Replace damaged propellers immediately.
- **Check Frame:** Inspect the frame for any signs of damage or loose screws. Tighten as necessary.
- **Motor Inspection:** Ensure motors spin freely and quietly. Check for any debris or loose wires.
- **Battery Care:** Store batteries at a safe storage voltage (around 3.8V per cell) when not in use. Do not overcharge or over-discharge.
- **Clean Components:** Keep the flight controller, ESCs, and other electronics free from dust and moisture.

## 9. Troubleshooting

This section addresses common issues you might encounter.

| Problem | Possible Cause | Solution |
|---|---|---|
| Drone does not arm. | Safety switch not pressed, radio not calibrated, pre-arm checks failed (e.g., no GPS lock). | Press safety switch, recalibrate radio, check ground station for pre-arm messages. |
| One or more motors not spinning. | Loose motor/ESC connection, faulty ESC, faulty motor, incorrect ESC calibration. | Check all connections, recalibrate ESCs, test individual motor/ESC units. |
| Drone drifts during hover. | Accelerometer not calibrated, unbalanced propellers, uneven motor thrust. | Recalibrate accelerometer, check propeller balance, recalibrate ESCs. |
| Loss of control/signal. | Receiver not bound, range exceeded, interference. | Re-bind receiver, ensure flight within range, check for sources of interference. |

For more detailed troubleshooting, consult the online resources and community forums for your specific flight controller software (e.g., Ardupilot, PX4).

## 10. Specifications

- **Brand:** HAWK'S WORK
- **Model Name:** F450
- **Item Model Number:** F450-KIT
- **Wheelbase:** 450mm
- **Maximum Take-off Weight:** Approximately 1.8 kg
- **Material:** Plastic
- **Item Weight:** 2.42 pounds (1.1 Kilograms)
- **Product Dimensions:** 14.57"L x 14.57"W x 7.07"H
- **Battery:** 1 Lithium Polymer battery (11.1V 4200mAh) included
- **Included Components:** Battery, Propeller, Protective Frame, Screwdriver, User Manual, ESCs, Brushless Motors

- **Connectivity Technology:** Radio Frequency
- **Control Type:** Remote Control (Transmitter not included in this kit)

## 11. Warranty and Support

HAWK'S WORK provides a free replacement for quality problems within 3 months of purchase. For further assistance, please contact HAWK'S WORK customer support.
While no official product videos were found from the seller, additional video tutorials and troubleshooting guides may be available online from the community. We recommend searching for resources related to Pixhawk, Ardupilot, or PX4 flight controllers for comprehensive support.

*Image: A graphic indicating the availability of a manual book, video tutorials, and troubleshooting support for the drone kit.*