Hummingbird Stack User Guide

(Applicable for Hummingbird 200 / 305 Stack)

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1. Binding the Built-in Receiver

Receiver Type: UART-based ExpressLRS Receiver

- **Enter Binding Mode**
  - **Power Cycle x3**: Power the FC on and off 3 times to enter binding mode (Blue LED double flash)
  - **ELRS 3.55 and above**: After powering on, **press the onboard button for 1–2 seconds** to enter binding mode (Blue LED double flash)
- **Enter Wi-Fi Mode**
  - **Wait 60 seconds**: Without connection for 60 seconds after power-on, the receiver will enter Wi-Fi mode automatically (Blue LED fast flash)
  - **ELRS 3.55 and above**: **Long press the onboard button for 4 seconds** to enter Wi-Fi mode (Blue LED fast flash)
- **Firmware Update Note**
  - Firmware name: **NewBeeDrone Diversity 2.4GHz RX V2**
  - Ensure you use the correct firmware. Flashing the wrong firmware can damage the receiver.

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2. Using an External Receiver

- The internal receiver **cannot be fully disabled** — it can only be deactivated by disabling the corresponding UART.
- **UART Assignments**:
  - Hummingbird 200 FC → Internal RX on **UART1**
  - Hummingbird 305 FC → Internal RX on **UART6**

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3. SD Card Recognition

- Maximum SD card size supported: **32GB**

- **Blackbox** recording supports up to **4GB** usable space
- SD card slot location is marked on the wiring diagram

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4. AM32 ESC Settings

- Settings must be configured based on **motor KV**, **motor pole count** (magnet count), and **timing**.
- For high-KV race motors (e.g., 2207 2050KV): Set timing to **21.5° (maximum)**.
- Tested: 2150KV motors on 6S with 21.5° timing show no desync issues.
- **PWM Frequency**:
  - Use **fixed PWM** — 48kHz is recommended for racing.
  - Floating PWM with sync is not recommended, especially for high-KV race motors.

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5. Betaflight 4.6 Gyro Clock Sync （No Official Version Yet）

- The new Gyro Clock Sync feature in Betaflight 4.6 works automatically.
- **No manual configuration is required.**

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6. Motor and Power Wire Soldering

- Both Hummingbird 200 and 305 ESCs use a **3D triple-side solder pad design**.
- Soldering method:
  1. Apply solder to both the top and bottom pads.
  2. Place the wire into the center half-hole slot.
  3. Add solder to secure the wire in place.
- This ensures maximum electrical conductivity and mechanical strength.

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7. Flight Controller Installation Precautions

- Before installation, check if any onboard components may touch the frame or other parts.
- Before tightening nuts, inspect from the side for possible contact points.
- If any parts are very close, cover them with **insulating tape** to prevent short circuits.
- Since the receiver and antennas are built in, avoid pressing or fitting parts too tightly during installation, which could deform or damage the internal antennas.

8. Protection and Maintenance

- Apply **conformal coating** to both sides of the flight controller when possible.
  - Recommended for racing and freestyle flying.
  - Helps protect against dust, moisture, and debris that can cause shorts or component failure.
- This is a hobby-grade DIY product — damage caused during use **is not covered under warranty**.
- Every flight controller is **100% factory tested** before shipping.

Note: Please read this manual carefully before use. Proper installation and maintenance will greatly improve the product's lifespan, reliability and performance stability.